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2020 Non-Registered Site Field Investigation Report

TVA Gallatin Fossil Plant
Sumner County, Tennessee

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Quality Information

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This report presents the results of a field investigation at the Non-Registered Site (site) located at the Gallatin Fossil Plant, near Gallatin, Tennessee. AECOM prepared this report in accordance with current industry standards and practices. The interpretations and conclusions presented in this report are professional opinions based solely upon indicated data described in this report, documents reviewed, and visual observations of the site. Opinions and recommendations presented herein apply to the environmental, geologic, and hydrogeologic conditions existing at the time this document was prepared and cannot necessarily apply to site changes, additional data, or the broadening of knowledge of which AECOM is not aware and has not had the opportunity to evaluate.

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Executive Summary

AECOM conducted a field investigation from January to October 2020 on behalf of the Tennessee Valley Authority (TVA) to collect hydrogeologic and geochemical data at TVA's Gallatin Fossil Plant (GAF) Non-Registered Site (NRS), near Gallatin, Tennessee. The NRS is a former coal combustion residuals (CCR) disposal unit that operated at GAF from 1956 to 1970. Groundwater in four monitoring wells screened in the fine-grained alluvium underlying the NRS have a low pH and metals concentrations that exceed the groundwater protection standards (GWPS).

The field investigation data were collected primarily to support a laboratory treatability test and field demonstration to evaluate remedial technologies capable of adjusting pH and sequestering metals in groundwater on the downgradient perimeter of the NRS near the Cumberland River. The laboratory treatability test was performed in parallel with this field investigation but separately, and the field demonstration work will be performed following completion of the laboratory treatability test.

Specific objectives for the field investigation include the following:

- To update the conceptual site model (CSM) with additional information regarding the location of the low-pH source material, the primary groundwater transport pathways and velocities between the source area and the downgradient NRS boundary, groundwater and solute flux, and subsurface characteristics that would affect remedial amendment delivery;
- To obtain site groundwater and soil material for the laboratory treatability test; and
- To obtain preliminary design data in the potential field demonstration areas.

As part of the field investigation, AECOM completed the following to meet the above objectives:

- Drilled 15 borings using direct push technology to limestone bedrock refusal, logged soil core, collected 63 soil samples for geochemical analysis, and collected 17 in situ groundwater samples for analysis; at seven borings logged electrical conductance (EC) and relative permeability with a hydraulic profiling tool;
- Drilled three borings with a sonic drill rig into limestone bedrock, logged continuous soil core, collected soil material for the laboratory treatability test, and installed monitoring wells at two of the three boring locations;
- Sampled 14 wells screened in fine-grained alluvium four to five times each, analyzed samples for metals and various inorganic analysis, and gauged groundwater elevations nine times; and
- Conducted slug tests in six wells and a low-flow drawdown test in two wells to estimate hydraulic conductivity of the unconsolidated alluvial material.

Acid generation can occur by the weathering and oxidation of pyrite in the unsaturated zone. This reaction produces acidic seepage that is capable of dissolving metals from soil to groundwater at concentrations above the GWPS. A key source of acid generation is suspected to be located hydraulically upgradient of the NRS near where high sulfur coal was historically stored and where pyrite rejects may have been sluiced to the NRS and co-disposed with the CCR. This area contains some of the highest pyritic sulfur mass fractions (up to 3%) analyzed in NRS CCR/soil samples and most samples were characterized as potentially acid generating (PAG) based on acid base accounting. This area is referred to as the primary pyritic sulfur area and it overlies well GAF-441U, which is screened in the clayey alluvium and is where the lowest pH and highest dissolved metals concentrations are observed in groundwater at the NRS and surrounding area.

Investigation activities have not directly identified a transport pathway hydraulically downgradient of the primary pyritic sulfur area toward the NRS perimeter where monitoring wells with low pH and elevated metals exist. For groundwater to travel the 850 to 1,200 feet distance from the primary pyritic sulfur area to the NRS perimeter requires a hydraulic conductivity at least one order of magnitude higher than the 8E-06 centimeter/second estimated for the bulk clayey alluvium. It is suspected that transport is through discrete layers of more permeable material, such as clayey/silty sands that have been observed at locations scattered throughout the NRS. Such discrete, non-contiguous layers are difficult to intersect with monitoring wells and borings.

In addition to updates to the CSM described above, this Field Investigation Report provides a compilation of both existing and new hydrogeologic and geochemical information that will support the design of the field demonstration to further test remedial technologies to treat low pH groundwater with elevated metals.

1. Introduction

1.1 Project Summary

AECOM prepared this Field Investigation Report on behalf of the Tennessee Valley Authority (TVA) to present the results of a field investigation conducted from January through October 2020 at the Non-Registered Site (NRS) at TVA's Gallatin Fossil Plant (GAF). The GAF is a coal-fired steam power plant located in north-central Tennessee just south of the City of Gallatin (**Figure 1-1**). The NRS is a former coal combustion residuals (CCR) disposal unit that operated at GAF from 1956 to 1970.

This work was performed in response to the Tennessee Department of Environment and Conservation (TDEC) Commissioner's Order Number OGC19-0004 (the Order) requiring that TVA conduct a laboratory treatability test and field demonstration aimed at adjusting pH to sequester metals in groundwater along the NRS boundary adjacent to the Cumberland River to evaluate whether such actions can result in achievement of groundwater protection standards (GWPS) (**Table 1-1**). The Order also requires future development of a Corrective Action/Risk Assessment (CARA) Plan for closure of the NRS and remediation of groundwater to be completed following the field demonstration.

The primary goals of the NRS field investigation were to collect data to support the laboratory treatability test and field demonstration of treatment technologies, and to update and improve the understanding of hydrogeologic and geochemical conditions in the subsurface, referred to herein as the conceptual site model (CSM). The field investigation was performed in accordance with the TDEC-approved *NRS Treatability Test Work Plan, TVA Gallatin Fossil Plan, September 27, 2019* (Work Plan), except where deviations are noted in this document. The data collected during the 2020 NRS field investigation are evaluated in this report along with available existing data to update the NRS CSM.

The laboratory treatability study was conducted concurrently with this field investigation to evaluate a permeable reactive barrier (PRB) as a technology to treat groundwater in situ along the NRS boundary adjacent to the Cumberland River. Also, the laboratory treatability study evaluated in situ soil stabilization and direct soil mixing to treat source area soil/CCR and minimize further migration of low pH groundwater and the dissolution of metals hydraulically downgradient. The laboratory treatability test results will be reported under separate cover and used in conjunction with the field investigation results to select the area to perform a field demonstration of a PRB or other plume treatment technology.

1.2 Non-Registered Site History

Construction of the GAF began in 1953 and started with earth-moving activities to build three planned CCR disposal areas. This earth work included the construction of the initial embankments for the three disposal areas, which are today known as the NRS (original Areas 1 and 2) and the Ash Pond Complex (original Area 3), shown on TVA Drawing 10N200 (**Figure 1-2**). The GAF began operation in 1956 with full operation in 1959.

The NRS was constructed with earthen perimeter containment dikes and internal dikes dividing the NRS into four operating areas designated as A, B, C, and D (**Figure 1-3**). CCR (primarily bottom ash) collected during coal combustion was mixed with water and sluiced to the impoundment, allowing the settling of CCR solids prior to discharging water from the impoundment to the Cumberland River. Historical sluicing operations at the NRS are shown on a 1961 aerial photograph on **Figure 1-4**. Some current site features (e.g., the NRS boundary, existing monitoring wells and borings) are also shown on **Figure 1-4** for reference and are discussed later.

Preparation of coal for combustion in the power plant included separating pyritic materials from the coal. It is known that these pyrite or mill rejects were also sluiced to the NRS (TVA, 1967). It is suspected that heavier pyrites may have settled out in the vicinity of the historic ash sluice discharge to the NRS and that the weathering of these pyrites produced low pH seepage capable of dissolving metals from soil to groundwater at concentrations above the GWPS. Such conditions are observed in alluvial groundwater at monitoring well GAF-441U near the historic sluice discharge (primary pyritic sulfur area), and hydraulically downgradient at monitoring wells 19R, S3, and GAF-444U (**Figure 1-3**). The estimated extent of the primary pyritic sulfur area shown on **Figure 1-3** has been updated from the Work Plan

(potential upgradient source area) based on acid base accounting data collected during the 2020 field investigation, as further discussed in Section 4.3.1.

At the NRS, low pH and elevated metals in groundwater above GWPS are limited to the unconsolidated material (predominantly alluvium) underlying the CCR and overlying limestone bedrock (Section 1.3.3). Therefore, the 2020 field investigation focused on the unconsolidated material, with emphasis on the southern portion of the NRS where the low pH and metals impacted monitoring wells are located.

The NRS served as the initial CCR disposal unit until 1970. It is currently a 70-acre closed surface impoundment that contains approximately 2 million cubic yards of CCR. In 1995, TVA developed a Closure Plan for the NRS, which was approved by TDEC in 1997. During 1997 and 1998, the NRS Closure Plan was implemented, including placing a 1-foot soil cover over areas where vegetation was not already well established, lining the coal yard runoff ditch (CYRD) with concrete to minimize infiltration of ditch conveyance water to the subsurface, and plugging the remaining spillway to the Cumberland River with concrete. Storm water from the NRS is currently collected to the north of the NRS and discharged through the National Pollutant Discharge Elimination System storm water outlet F13 (**Figure 1-3**) in accordance with Tennessee Multi-Section Permit for Storm Water Discharges Associated with Industrial Activity (TNR053186).

TVA converted to a dry CCR handling process for fly ash in 2016 and began trucking fly ash and gypsum from the newly constructed flue gas desulphurization 'scrubber' units to the newly constructed lined and permitted North Rail Loop Landfill. Fly ash and bottom ash (CCR) are no longer sluiced to ash ponds.

1.3 Non-Registered Site Setting

1.3.1 Topography and Surface Drainage

GAF is located on a peninsula (Odoms Bend), with the Cumberland River surrounding the property to the east, south, and west (**Figure 1-1**). The ground surface elevation of the peninsula ranges from a low of approximately 445 feet mean sea level (ft msl) at the river to a high of approximately 596 ft msl in the east central portion of the peninsula. The NRS is in the southwestern portion of the peninsula adjacent to the Cumberland River (**Figure 1-1**). The ground surface elevation at the NRS slopes westward from approximately 520 ft msl at the base of the coal pile to 445 ft msl at the river, as shown in the current (2017) topographic map (**Figure 1-5**). The current land surface was modified from its native form by excavation, grading, and fill placement during GAF construction. A TVA archived 1952 surface topography map, based on aerial photography with limited control points, is overlain on the 2017 aerial photo of the NRS area on **Figure 1-6**. Comparison of **Figures 1-5 and 1-6** reveal that the coal yard area was excavated and flattened during site development. The native surface where CCR was later placed was incised by valleys with drainage to the Cumberland River, which was at a river stage of approximately 410 ft msl in 1952.

The portion of the river surrounding Odoms Bend is commonly referred to as Old Hickory Lake (or Reservoir) due to the regulation of its westward flow by Old Hickory Lock and Dam, located approximately 25 miles downstream of GAF. Old Hickory Lake is maintained by the United States Army Corps of Engineers (USACE) for the purpose of flood control, power production, water quality, and public use (USACE, 2016). Old Hickory Dam construction started in 1952 and was completed in 1954. Old Hickory Dam raised the Cumberland River elevation approximately 35 feet beginning in December 1956. The reservoir reached full pool elevation (about 445 ft msl) in January 1957 (USACE, 1959). GAF construction began in 1953.

The USACE maintains a relatively consistent water level in Old Hickory Lake at approximately 444.5 ft msl. Based on TVA's remote water level sensors, the river water level at GAF typically fluctuates about 4 feet, from approximately 442.5 to over 446.5 ft msl (maximum reading for instrument) (AECOM, 2021).

1.3.2 Climate

The average high temperatures in the area are 49 degrees Fahrenheit (ºF) in the winter, 70ºF in the spring, 89ºF in the summer, and 72ºF in the fall. The average annual precipitation for the area is 52 inches. The maximum average monthly precipitation of 5.73 inches occurs in May and the minimum average monthly precipitation of 3.26 inches occurs in October (AECOM, 2021).

1.3.3 Hydrogeologic Setting

The GAF property is located within the Central Basin section of the Interior Lowlands physiographic province, which is a large topographic lowland that exists at an average elevation of approximately 600 ft msl (Hawkins and Colton, 1882). The bedrock units underlying the peninsula are nearly flat lying Ordovician limestones, dolomites, and shales. The bedrock stratigraphy encountered from the surface (youngest) to the deepest (oldest) units includes the Bigby-Cannon Limestone, Hermitage Formation, Carters Limestone, Lebanon Limestone, and Ridley Limestone (AECOM, 2021). The Bigby-Cannon, the Hermitage, and a portion of the Carters are absent beneath the NRS due to erosion. The bedrock topographic surface slopes toward the west-southwest from the coal pile to the river beneath the NRS area, as shown in the bedrock surface elevation contour map on **Figure 1-7**.

Water-bearing fractures, designated the L1 and the L2, have been characterized in the Lebanon Limestone underlying the GAF peninsula during other studies (AECOM, 2021). The L1 fracture zone occurs in a stratigraphic interval that is approximately 15 feet thick, extending from 390 to 405 ft msl at the NRS. The L2 fracture zone occurs approximately 30 feet below the L1 fracture zone within the NRS. While the L1 and L2 fracture zones may be correlated across numerous boreholes, they are not necessarily interpreted to be single continuous fractures. Rather, they each represent a 10 to 15-feet thick section of Lebanon Limestone that may contain one or more fractures.

The bedrock is overlain by clay-rich unconsolidated material, also referred to as overburden. The unconsolidated material includes highly weathered bedrock (residuum), native alluvium, fill, and a mixture of fill and alluvium, but excludes CCR and the coal pile. The native soil beneath the NRS was deposited in alluvial terraces. These Quaternary-age sediments were deposited along the inside meander of the river, and primarily consist of lean-clay with some intermixed sands and gravels (AECOM, 2021). These deposits form relatively flat-topped terraces with steeply sloping faces that mark historical stages of the river when the terraces were deposited. The older (higher) terraces may be partially eroded, while the lower terraces are now submerged by Old Hickory Lake. The thickness of the unconsolidated material in the NRS area ranges from several feet to over 100 feet, as shown on the isopach map on **Figure 1-8**. Overall, the native alluvium has a low hydraulic conductivity due to the high content of silt and clay in the deposits, as discussed later in Section 3.3.

At the NRS, CCR overlies the unconsolidated deposits. It ranges in thickness from 0 feet on the NRS edges to 50 feet or greater in the NRS center, as shown on the CCR isopach map on **Figure 1-9**. The juxtaposition of the subsurface sediments and bedrock geologic units underlying the NRS area is shown conceptually in cross sectional view on **Figure 1-10**.

The hydrogeology and geochemistry of the unconsolidated material in the NRS area and the occurrence of low pH and elevated metals in the unconsolidated material groundwater observed at monitoring wells 19R, S3, GAF-441U, and GAF-444U (**Figure 1-3**) was the focus of the 2020 field investigation. Further discussion of the hydrogeology and geochemistry of the NRS subsurface, including updates resulting from this 2020 field investigation are provided in Sections 3 and 4, respectively.

1.4 Field Investigation Objectives

As developed in the Work Plan (AECOM, 2019), the field investigation objectives were as follows:

Obtain additional information to incorporate into the CSM, including:

- Locate the source material producing low pH groundwater conditions.
- Assess the primary groundwater transport pathways between the source area and the downgradient NRS boundary.
- Estimate groundwater velocity and solute travel times through unconsolidated deposits beneath and around the NRS.
- Obtain data to calculate solute flux in potential field demonstration areas (near wells 19R and GAF-444U).
- Obtain data to assess the feasibility of various remedial amendment delivery mechanisms (i.e., direct injection, soil mixing, etc.).
- Assess the extent of impacts requiring treatment near the NRS by performing comprehensive sampling of existing wells and focused soil testing.

Obtain material for the bench-scale treatability study including:

- Groundwater and native soil representative of the low pH conditions in the alluvium
- Source material potentially responsible for generating the low pH conditions in groundwater

Provide preliminary design data for potential pilot field demonstration areas, including:

- Identify the location and extent of acid-generating source materials in an area suitable for pilot testing.
- Characterize the hydrogeology of potential treatment zones.
- Delineate the extent of metals impacts within potential field demonstration areas.
- Profile geochemical characteristics in the potential field demonstration areas.

1.5 Previous Investigations

A large network of borings and monitoring wells have been drilled at the NRS for the collection of environmental and geotechnical data since the NRS Closure Plan was approved by TDEC in 1997 (Section 1.2). These data have been used to develop a robust characterization of CCR, unconsolidated material, and bedrock at the NRS, including subsurface material thicknesses and elevations, soil chemical composition, groundwater and CCR porewater chemistry, groundwater flow directions, hydraulic conductivity, and geotechnical properties. The boring and monitoring well locations from these previous investigations are shown on **Figure 2-1**. The previously collected data are used in conjunction with new data collected during the 2020 field investigation to refine and update the hydrogeologic and geochemical CSM for the NRS (Sections 3 and 4). Key prior investigations at the NRS are summarized below.

Compliance Groundwater Monitoring (2000 to Present)

The NRS Closure Plan included requirements for routine detection groundwater monitoring, which was initiated in three monitoring wells in October 2000. Concentrations of beryllium, cadmium, and nickel in samples collected from well 19R (**Figure 1-3**) were detected above the TDEC maximum contaminant levels and the GWPS for the NRS, triggering the need in 2009 for assessment monitoring to determine whether CCR in the NRS had impacted groundwater. Assessment monitoring activities included installation, sampling, and analysis of 11 monitoring wells and 15 CCR porewater sampling locations (lysimeters and monitoring wells); soil data collection and analysis (representing CCR, fill, and native alluvium); an ecological risk assessment; and a human health risk assessment (TVA and Arcadis, 2014). The assessment phase of compliance groundwater monitoring is ongoing at the NRS and currently includes quarterly monitoring two downgradient monitoring well clusters, each consisting of one alluvial and one bedrock well (wells 19R/26 and 20/27), and one background alluvial well (22) (**Figure 2-1**). Compliance monitoring results for these wells in 2020 are included in this Report.

2015 NRS Field Investigation

The 2015 NRS field investigation was performed to evaluate potential sources of acid generation and low pH in alluvial groundwater in support of ongoing NRS assessment monitoring. The coal pile, the CYRD, the chemical pond, CCR, and pyrite rejects in the CCR were evaluated as potential sources of acid generation. Phase I of the field investigation included geophysical surveys (ground conductivity, electrical resistivity imaging, and seismic refractions) to identify areas where pyrite rejects may be located, thickness of CCR, and depth to bedrock. In situ soil and groundwater sampling also was performed to assess soil, groundwater, and CCR porewater pH. No obvious source of acid generating materials were identified during the Phase I investigation. The results of Phase I were reported by AECOM (2015).

A Phase II investigation was initiated at the NRS later in 2015 to further evaluate pyritic/sulfidic materials present in or near the NRS, or potentially co-disposed with CCR during NRS operation, as a source of acid generation. A focus of this investigation was CCR and unconsolidated material chemical characterization, specifically soil pH analyzed in the field and laboratory analysis of soil for acid base accounting. Also, seep, surface water, groundwater, and CCR porewater samples were collected and analyzed and stratigraphic data were collected from soil borings (NRS001 through NRS050, **Figure 2-1**). The results of Phase II were reported by AECOM (2016).

The 2020 field investigation continues the pyrite source evaluation initiated in the 2015 investigation. Acid base accounting and other data collected during the 2015 NRS field investigation are an integral part of the geochemical CSM update (Section 4), and thus are presented and discussed in this Report.

GAF Site-Wide Environmental Investigation (EI) (2016 to 2020)

The EI included investigations in and around the NRS, such as installation of soil borings to collect analytical data of the CCR and characterize CCR thickness, installation of CCR monitoring wells to measure the phreatic surface, installation and sampling of additional alluvial and bedrock wells, and slope stability analysis of the dikes. The results of the EI will be presented in the upcoming Environmental Assessment Report (AECOM, 2021). Results related to the NRS are incorporated into this Report.

1.6 Field Investigation Report Organization

This Field Investigation Report is organized as follows:

- Section 1 (Introduction) provides the project summary, background information, field investigation objectives, and prior investigations.
- Section 2 (Field Investigation Summary) summarizes the field investigation activities, including discussions of relevant field observations and deviations from the Work Plan.
- Section 3 (NRS Hydrogeology) presents the results of hydrogeologic data collected during the 2020 field investigation and select data from prior investigations at the NRS. The discussion of these results combined form the basis for updates to the hydrogeologic portion of the CSM.
- Section 4 (NRS Soil and Groundwater Geochemistry) presents the results of geochemical data collected during the 2020 field investigation and select data from prior investigations at the NRS. The discussion of these results combined form the basis for the updates to the geochemical portion of the CSM.
- Section 5 (Summary and Conclusions)
- Section 6 (References)

2. Field Investigation Summary

2.1 Field Investigation Approach

The NRS field investigation was performed in accordance with the Work Plan (AECOM, 2019), except for minor deviations that are summarized in **Table 2-1**. NRS site-wide field activities included groundwater sampling, well water level elevation measurements, and hydraulic conductivity testing, with emphasis on the unconsolidated material. More focused investigations were conducted on the NRS south end in the three areas where elevated metals and low pH groundwater occurs in unconsolidated material at monitoring wells GAF-441U, GAF-444U, and 19R/S3. Data were collected in these areas to update the CSM, to support the laboratory treatability study being performed concurrently with this field investigation, to select a suitable area(s) for the field demonstration study of treatment technologies, and to support the design basis for the field demonstration. The focused investigation activities included the following (see **Figure 2-1**):

- Drilling 15 borings using direct push technology (DPT) to bedrock refusal, logging soil core, collecting soil samples for geochemical analysis, and collecting in situ groundwater samples for analysis; and at the seven borings in the GAF-444U area, logging electrical conductance (EC) and relative permeability with a hydraulic profiling tool (HPT)
- Drilling one boring with a sonic drill rig in each of the three focus areas (near monitoring wells GAF-441U, GAF-444U, and 19R/S3) into bedrock, logging continuous soil core, collecting soil material for the laboratory treatability test, and installing monitoring wells at two of the three boring locations

Cascade Drilling (Cascade) performed the DPT, HPT, and sonic drilling work under the supervision of AECOM, from January to March 2020. An AECOM Professional Geologist, licensed in the State of Tennessee, logged the soil core collected during drilling. AECOM staff collected the soil and groundwater samples for chemical analysis and conducted the hydraulic tests from January through October 2020.

A summary of the samples collected, and the testing performed during the 2020 NRS field investigation is presented in **Table 2-2**. These new analytical data were integrated into the GAF database with the previously collected data at the NRS. The combined data were used to develop the updated CSM presented in Sections 3 and 4. **Figure 2-1** shows the locations of new and existing data point locations (monitoring wells, borings, seeps) used in these evaluations. Details of the soil borings drilled in both the 2015 and 2020 NRS investigations (location coordinates, datum elevations, total boring depth, and depth of general material type encountered) are provided on **Table 2-3**. Details of the existing and new monitoring wells at the NRS (location coordinates, datum elevations, total boring and well depths, screen depth intervals, and subsurface material screened) are presented in **Table 2-4**.

2.2 Direct Push Technology Investigations

2.2.1 Hydraulic Profiling

The focused field investigation on the NRS south end was initiated with hydraulic profiling in the area of NRS perimeter monitoring well GAF-444U from January 22 to January 24, 2020 using a DPT rig equipped with HPT. The HPT provided EC and relative permeability (the ratio of HPT average flow to the corrected pressure) profiles with depth at each boring.

The HPT was advanced at seven locations (NRS051 to NRS056 and NRS067) along a 200-foot long transect on the NRS perimeter dike, centered on monitoring well GAF-444U (**Figure 2-1**). The intention of the HPT investigation was to identify zones of higher estimated hydraulic conductivity and focus groundwater sampling at these depths. The HPT was advanced to the depth of refusal, which ranged from 29 feet below ground surface (ft bgs) at NRS051 to 86 ft bgs at NRS053. Refusal was the shallowest at the northeastern end of the transect and deepest near monitoring well GAF-444U.

During HPT profiling, dissipation tests are typically targeted where more permeable strata are encountered because the test can be run more quickly in more permeable strata (on the order of minutes) compared to less permeable strata (on the order of hours or even days). More permeable strata can be identified by an increase in HPT flow rate and a decrease in pressure. Dissipation tests were run at one interval in each HPT boring except NRS051. Zones of

higher permeability were identified as the HPT investigation progressed, and the draft data were used to identify depth zones for potential groundwater sampling (Section 2.2.2).

The HPT log profile data were reduced during field work by Cascade, and following field work, AECOM further evaluated the data. Due to the low permeability of the unconsolidated dike material and native alluvium, the dissipation tests seldom stabilized, which resulted in erroneously high estimated water table depths. AECOM reevaluated the data using Geoprobe's DI Viewer software and manually input the water table at 33.1 ft bgs (as measured at GAF-444U in January 2020) and manually entered an atmospheric pressure of 14.44 pounds per square inch. This generated a corrected pressure profile, which was used to generate the relative permeability profile. The HPT derived relative permeability can be converted to hydraulic conductivity using the DI Viewer software for formations with a hydraulic conductivity range of 0.1 feet per day (ft/d) (4E10-5 centimeters per second [cm/s]) to 75 ft/d (3E-02 cm/s). Because the NRS unconsolidated material is known to be generally lower than this range (Section 3.3), the hydraulic conductivity was not estimated from the HPT tool.

The EC, HPT flow, HPT pressure, and relative permeability profiles are provided in **Appendix A**. HPT data collected during the 2015 NRS field investigation also are included in **Appendix A**. These data are integrated into the discussion of groundwater flow characteristics in the unconsolidated materials in Section 3.

2.2.2 Soil and Groundwater Sampling During Direct Push Technology Drilling

A total of 15 soil borings were drilled with the DPT rig to collect soil and in situ groundwater samples for chemical analysis. Seven borings were located adjacent to each HPT profiling location in the monitoring well GAF-444U area and eight borings were drilled in the primary pyritic sulfur area near monitoring well GAF-441U. No additional DPT borings were drilled in the vicinity of well 19R as this area was investigated in 2015 (see DPT and HPT logs in **Appendix A**).

In the NRS perimeter area, DPT borings NRS051 to NRS056 and NRS067 (**Figure 2-1**) were located within 5 feet of each associated HPT boring. DPT refusal was encountered at depths between 35 ft bgs at NRS067 to 72 ft bgs at NRS053. Despite their proximity to the associated HPT boring, refusal at DPT borings NRS053 and NRS054 was 14 feet and 5 feet shallower, respectively, than the adjacent HPT borings. Refusal at DPT boring NRS051 was 10 feet deeper than the adjacent HPT boring.

The eight borings drilled in the primary pyritic sulfur area included borings NRS057 to NRS062, NRS064, and NRS065 (**Figure 2-1**). DPT refusal was encountered at depths between 33 ft bgs (NRS062) and 75 ft bgs (NRS060). Soil boring logs are provided in **Appendix B** and soil core photographs are in **Appendix C**.

In both investigation areas, soil samples were collected approximately every 5 feet in each DPT boring for field analysis of soil pH using the paste pH protocols described in the Work Plan. A total of 169 soil pH samples were analyzed during the investigation.

A total of 66 soil samples were submitted to ALS Environmental (ALS) in Tucson, Arizona, for laboratory analysis of acid-base accounting (ABA), which included reporting of total sulfur, sulfate, pyritic sulfur, residual sulfur, acid neutralization potential and net acid neutralization potential. As specified in the Work Plan, two samples were collected from each DPT boring in the NRS perimeter well GAF-444U area, and six samples were collected from each boring in the primary pyritic sulfur area. Most samples were composites of 5-foot intervals; shorter intervals were also composited.

Two soil samples per boring (30 total), one in the unsaturated zone and one in the saturated zone, were collected from each boring location for metals and general chemistry analysis and submitted to Eurofins TestAmerica for analysis. **Table 2-5** presents the analyte list for these samples. Most samples were composites of 5-foot intervals; shorter intervals were also composited, consistent with ABA sample collection.

In situ groundwater sampling was conducted within the same boring as soil samples were collected. In the area of monitoring well GAF-444U, HPT logs were reviewed to target more permeable zones to collect groundwater samples in each of the seven DPT borings. Some of these selections were modified in the field based on lithology encountered, presence or absence of groundwater, and obtaining good vertical coverage of groundwater samples. In the area of monitoring well GAF-441U (primary pyritic sulfur area), first groundwater was targeted for sampling because the shallow groundwater is closer to and more likely to be impacted by the suspected source of acid generation in the oxidized vadose zone.

Once the soil core was removed from the borehole, the driller deployed a 48-inch retractable sampler to obtain an in situ groundwater sample. Field parameters pH, dissolved oxygen (DO), and oxidation reduction potential (ORP) were measured by collecting groundwater in a decontaminated cup and inserting a multi-parameter sonde. Filtered and unfiltered samples were collected for analysis of dissolved and total target metals (beryllium, cadmium, lithium, and nickel). Though the dissolved samples were field filtered, the water remained visibly turbid, indicating breakthrough of the 0.45-micron filter.

Table 2-6 provides a summary of the in situ groundwater samples collected and attempted, the sampling depth interval, and the analyses performed for both the 2020 and 2015 field investigations.

Samples, including associated quality control samples, were placed on ice and shipped to Eurofins TestAmerica in Pittsburgh, Pennsylvania (PA), under chain-of-custody procedures. Field sampling sheets are included as **Appendix D**. Environmental Standards, Inc. performed verification and validation of the soil and groundwater chemical analysis performed by Eurofins TestAmerica in accordance with the Quality Assurance Framework Addendum, provided as Appendix A to the Sampling and Analysis Plan, Treatability Study NRS (Appendix B of the Work Plan), and entered the validated analytical data into the GAF site-wide database.

2.3 Sonic Drilling

Borings were drilled with a sonic rig adjacent to existing monitoring wells 19R (boring NRS068), GAF-441U (boring NRS069), and GAF-444U (boring NRS070) (**Figure 2-1**) to collect bulk unconsolidated soil material for treatability testing, to identify the top of bedrock, and if conditions allowed, install a monitoring well screened in unconsolidated material between the existing well and top of bedrock. The borings were drilled from March 9-13, 2020.

2.3.1 Bulk Soil Collection

Bulk unconsolidated soil material for the treatability study was collected at locations known to have low pH in soil and groundwater (i.e., the screen intervals of monitoring wells 19R, GAF-444U, and GAF-441U). Bulk soil was collected at the following locations and depths:

- NRS068 – 40 gallons of soil were collected from 40 to 58 ft bgs from two adjacent borings (within 2 feet of each other).
- NRS069 – 10 gallons of soil were collected from 40 to 50 ft bgs.
- NRS070 – 20 gallons of soil were collected from 50 to 60 ft bgs.

The bulk soil was homogenized in the field to the extent possible by boring location, packed into 5-gallon buckets, and shipped to AECOM's treatability laboratory in Austin, Texas (TX).

Composite samples were collected from the bulk soil at each boring and analyzed for chemical parameters on **Table 2-5**, except for total organic carbon. Samples were submitted to ALS for ABA analysis, to DCM Sciences for x-ray diffraction analysis, and to Eurofins TestAmerica for metals, general chemistry, and sequential extraction analysis as part of material characterization for the treatability study. Data validation and database entry were performed consistent with sampling and analysis during DPT drilling (Section 2.2.2).

Undisturbed soil samples were collected in Shelby tubes during advancement of borings NRS068, NRS069, and NRS070 to obtain samples with relatively undisturbed soil structure and preserved redox state and chemical conditions for potential use in the treatability tests. The Shelby tubes were collected either directly above or below the bulk soil collection interval. Upon retrieval, the ends of the Shelby tube were sealed with wax and secured with bottom caps and tape. The Shelby tubes were packaged and shipped to the AECOM treatability testing laboratory in Austin, TX.

2.3.2 Monitoring Well Installation

Two monitoring wells were installed adjacent to and deeper than existing well GAF-441U and wells 19R/S3 to characterize the vertical extent of low pH and metals impacted groundwater at those locations. Monitoring well GAF-526U was installed in boring NRS068, and monitoring well GAF-541U was installed in boring NRS069 (**Figure 2-1**). Originally a deeper well, to be screened from about 70 to 75 ft bgs, was planned adjacent to monitoring well GAF-444U (screened 50 to 60 ft bgs); however, the sonic boring (NRS070) encountered bedrock shallower than expected (at 63.5 ft bgs), due to the irregular bedrock surface in this area. The bedrock was penetrated 6.5 feet to assess

whether there was a suitable bedrock transition zone to screen; however, the bedrock encountered was hard and dry and was not a suitable interval to screen a well.

Sonic drilling was initially attempted without the addition of water to the borehole. No issues were encountered during the advancement of NRS069 and monitoring well GAF-541U installation. However; at boring NRS068 the accumulation of mud necessitated flushing the boring with approximately 525 gallons of water prior to well GAF-526U installation, thus dry drilling was discontinued. Boring NRS070 was backfilled with bentonite chips. Borings NRS068 and NRS069 were backfilled with bentonite chips to within 2 feet of the base of the well screen interval.

Monitoring wells GAF-526U and GAF-541U were constructed of 2-inch diameter schedule 40 polyvinyl chloride riser and well screen (0.010-inch factory slotted). Well completion details are summarized in **Table 2-4**. Well construction logs are included in **Appendix B**.

2.4 Monitoring Well Sampling and Analysis

2.4.1 Site-Wide Water Level Elevation Gauging

Water level elevations in existing and newly installed NRS monitoring wells were gauged in conjunction with GAF site-wide gauging events using calibrated water level meters (e.g. Solinst Model 101 or similar). In addition to the wells screened in the unconsolidated material, CCR wells and bedrock wells were also gauged. Gauging events in 2020 that included the NRS wells were conducted on January 12, February 11, March 16, April 13, May 11, June 15, July 13, August 17, and October 19, 2020. The results of NRS water level elevation gauging are discussed in Section 3.2.

2.4.2 Groundwater Sampling and Bulk Groundwater Collection

A total of 14 wells screened in the unconsolidated material were sampled during the field investigation, including 12 existing wells and the 2 new wells installed in March 2020. Six of the monitoring wells had never been sampled before this field investigation, including four existing wells GAF-439U, GAF-440U, GAF-442U, and GAF-489U screened in unconsolidated materials beneath the NRS interior, and the two newly installed monitoring wells GAF-526U and GAF-541U screened deeper in the unconsolidated material where known groundwater impacts exist. The four existing wells were installed during the EI (Section 1.5) to collect groundwater elevation data and soil geochemical data (AECOM, 2021).

As specified in the Work Plan (AECOM, 2019), low-flow sampling techniques were implemented to purge monitoring wells and collect groundwater samples for field parameter and laboratory analysis. The groundwater samples were submitted to Eurofins TestAmerica in Pittsburgh, PA, for metals and general chemistry analysis. **Table 2-7** provides the groundwater analyte list. ESI performed verification and validation of the groundwater chemical analysis performed by Eurofins TestAmerica in accordance with the Quality Assurance Framework Addendum, provided as Appendix A to the Sampling and Analysis Plan, Treatability Study NRS (Appendix B of the Work Plan).

Five rounds of groundwater samples were collected, including a baseline sampling round of the 12 existing wells in January 2020 and sampling of all 14 wells in April, June, August, and October 2020. Some of the NRS field investigation groundwater sampling coincided with the quarterly NRS compliance sampling of unconsolidated material wells 19R, 20, and 22 and Lebanon bedrock wells 26 and 27 in January, April, July, and October 2020. The results of all NRS sampling in 2020, including the two bedrock wells are reported in this Report in Section 4.1.

Bulk groundwater was collected for the laboratory treatability study periodically during 2020 at wells 19R, GAF-440U, GAF-441U, and GAF-444U. Unfiltered bulk groundwater was placed in unpreserved sample bottles after the groundwater samples were collected for the analyses listed in **Table 2-7**. When the bulk groundwater collection did not coincide with the sampling events noted above, wells were first purged using low-flow sampling techniques prior to collecting the bulk groundwater. Bulk groundwater was collected during the following periods:

Collection Date	19R	GAF-444U	GAF-441U	GAF-440U
January 2020	9 liters (L)			
February 2020		3L	2L	
March 2020	58 L	12 L		
June 2020	15 L	20 L	8 L	
August 2020	30 L			
October 2020	25 L	20 L	10 L	
November 2020				41 L

During each bulk groundwater sampling event, bottles were placed on ice and shipped to the AECOM treatability lab in Austin, TX.

2.5 Hydraulic Testing

Slug tests were performed in NRS unconsolidated material wells that had not been previously tested, including four existing wells (GAF-440U, GAF-442U, GAF-444U, and GAF-489U) and the two new wells (GAF-526U and GAF-541U), to estimate the hydraulic conductivity of the alluvium. The well locations are shown on **Figure 2-1**. All the wells tested are screened 10 feet or more below the groundwater level. One rising head test was performed in each well by introducing a 3-foot long, 1.6-inch outer diameter bailer into the well, allowing the water level to stabilize, then removing the bailer, and recording hydraulic head recovery in the well with a data logger. The data were analyzed using the Bouwer and Rice (1976) method.

Also, simple low-flow drawdown tests were performed at wells 19R and S3. Each well was pumped separately with the sampling bladder pump for 1 to 2 hours at a pumping rate of approximately 0.5 liters per minute. Drawdown was measured manually in the pumping well with a water level meter at approximately 5-minute intervals initially and up to 10-minute intervals at later times. The time-drawdown data were analyzed using the Cooper and Jacob (1946) method to estimate transmissivity. Hydraulic conductivity was estimated by assuming an aquifer thickness equal to the well screen length, due to the low pumping rate and absence of hydraulic influence in nearby wells screened at different depths.

The results of the hydraulic testing are presented and discussed in Section 3.3. The slug test analysis sheets and the low flow drawdown test calculation sheets are provided in **Appendix E**.

2.6 Surveying

Boring locations and monitoring wells were surveyed by DDS Engineering, PLCC of Bowling Green, Kentucky, on April 15, 2020. When one or more step-off borings were drilled at a location (e.g., NRS051/NRS051H), only one location was surveyed. The final survey data is reported on the boring logs and on **Tables 2-3 and 2-4**.

3. Non-Registered Site Hydrogeology

The key components of the hydrogeologic CSM are presented below, including saturated and unsaturated zone characteristics, hydraulic conductivity of the subsurface units, vertical and horizontal groundwater flow paths, and groundwater velocity and travel time.

3.1 Description of the Unconsolidated Material

The unconsolidated material beneath the NRS includes native alluvium associated with the historic river floodplain, residuum (or residual soil) associated with in-place weathering of bedrock, and fill related to TVA's development of the area. Throughout most of the NRS area, the unconsolidated material directly overlies the Lebanon Limestone. The exception is on the northeastern edge of the NRS at higher elevations where the Carters Limestone subcrops, as shown on the conceptual geologic cross section on **Figure 1-10**. The unconsolidated material thickness in the NRS area ranges from less than 10 feet near the river and in the coal yard area where a bedrock high exists to approximately 100 feet at several locations underlying the NRS, as shown on the isopach contour map on **Figure 1-8**.

The native alluvium underlying the NRS is predominantly fine-grained, consisting of clay and silty clay with varying amounts of sand (typically fine) and less frequently gravel. Occasional coarser layers of clayey (or silty) sand and/or gravel exist throughout the alluvium. These coarser layers are more permeable and range in thickness from less than 1 foot to approximately 10 feet thick, based on the review of historical and recent logs of borings drilled across the NRS. Approximately one quarter of the 50 continuous core boring logs reviewed included one or more clayey sand layer in the saturated zone. These clayey sand layers are of importance to the field investigation because such layers, if interconnected, provide preferential groundwater flow pathways that can transport low pH groundwater from the potential source area, as discussed in Section 3.5. Fewer of these clayey sand layers were identified in the 2020 field investigation (which focused on the areas near monitoring wells GAF-444U and GAF-441U) compared to the 2015 investigation (which covered the full NRS area). Boring logs for the 2015 and 2020 NRS investigations are provided in **Appendix B**. Poor or no soil core recovery may also indicate the presence of sandier zones.

The residuum is characterized as a fat clay on the south side of the NRS with a thickness less than 20 feet, while residuum on the north end is a fat clay with clayey sand and clayey gravel layers and ranges in thickness up to 35 feet (AECOM, 2018). It can be difficult to distinguish the residuum from the fine-grained alluvium during drilling.

Soil fill material is present primarily in disturbed areas around the main plant, located adjacent to the southeast corner of the NRS (**Figure 1-3**), dikes surrounding the NRS, and the remnants of the former internal dikes in the NRS. The perimeter dikes were constructed of compacted clay that is believed to be derived from native alluvial borrow soils (AECOM, 2018) and thus it is difficult to distinguish fill from the native alluvium during drilling. The 1952 surface topography (**Figure 1-6**) provides an indication of the approximate elevation of the native ground and fill contact, except in areas where the native ground was excavated and filled during the property development.

3.2 Groundwater Occurrence in Unconsolidated Material

The depth to groundwater in the unconsolidated material ranges from approximately near ground surface (at GAF-439U and GAF-447U) to 40 ft bgs (at GAF-442U) in the NRS area (**Table 3-1**). Deeper groundwater is generally associated with areas where CCR or fill has been placed over the native ground surface, raising the ground surface elevation. The depth to bedrock, which forms the base of the saturated unconsolidated material, ranges from 5 to 90 ft bgs. Shallow bedrock (less than 20 feet deep) occurs in the higher elevations near the coal pile and deeper bedrock occurs downslope toward the river where the native ground has been built up by dike material and CCR (**Figure 1-10**).

Due to the abundance of tight clay throughout the alluvium, it can be difficult to distinguish where a water table or saturated conditions exist during drilling. Wet alluvium was infrequently observed, and when it was, the material typically appeared to be slightly looser and more permeable, such as clayey sand. It is likely that these wet appearing layers and clayey sand layers in the saturated zone exist under confined conditions bound by tighter clay layers.

Groundwater in the unconsolidated material flows radially, but predominantly southwestward, from the topographic high in the coal yard area toward the Cumberland River, the discharge channel, and coves at the northern end of the

NRS, as shown on the potentiometric surface map for June 2020 on **Figure 3-1**. The saturated unconsolidated material terminates against bedrock approximately at the coal yard, as shown by the yellow line on **Figure 3-1**, where the unconsolidated material thins considerably. **Figure 3-1** also shows the groundwater elevations in bedrock and the phreatic surface in the CCR wells for evaluation of vertical flow paths, as discussed later in Section 3.4.

The horizontal hydraulic gradient in the unconsolidated deposits below the NRS is 0.037 feet per feet (ft/ft) from the CYRD to monitoring well 19R along flow line A-A' and 0.045 ft/ft from the CYRD to monitoring well GAF-444U along flow line B-B' (**Figure 3-1**), as estimated from the June 15, 2020, groundwater level measurements. The hydraulic gradient flattens between the 460 and 470 ft msl contour intervals, especially along flow line A-A' to 0.018 ft/ft. This may be an indication of higher permeability in the unconsolidated material in this area, increased recharge, or increased pore pressure due to larger thicknesses of overlying CCR. There have been few borings and no wells drilled in this area (**Figure 2-1**), as the soil stockpile and asbestos landfill cover a large portion of the surface.

Groundwater and CCR phreatic surface elevations were measured site-wide across the NRS nine times from January through October 2020 (**Table 3-1**). Measurements were made in wells screened in unconsolidated material, bedrock, and CCR to further refine horizonal and vertical flow pathways, hydraulic gradients, and groundwater velocity.

Groundwater elevations in the unconsolidated material and bedrock typically fluctuated less than 5 feet during the field investigation period, except for well GAF-489U that varied by 8 feet. Higher groundwater elevations were observed February through April 2020, and declining groundwater levels occurred May through October 2020. Groundwater elevation hydrographs are presented in **Figures 3-2a and 3-2b** for the unconsolidated material wells and bedrock wells, respectively. The June 15, 2020 groundwater elevation gauging event represents a mid-range of groundwater elevations (i.e., an average condition); thus, this event was selected for display of the potentiometric surface for unconsolidated materials on **Figure 3-1**. The groundwater flow direction and hydraulic gradient from other groundwater elevation gauging events were reviewed and found to be consistent with the June 15, 2020 event.

The hydraulic head in the CCR tends to be more variable than the hydraulic head in the unconsolidated material and bedrock, with variations up to 10 feet in most of the CCR wells and up to 20 feet in CCR well GP-5 (**Table 3-1 and Figure 3-2c**).

3.3 Hydraulic Conductivity

Hydraulic conductivity was tested in 11 NRS wells screened in unconsolidated material as part of this field investigation and the GAF site-wide Environmental Investigation (AECOM, 2021). These results are summarized in **Table 3-2**. The hydraulic conductivity varies by two orders of magnitude in the unconsolidated material, ranging from 9.2E-07 cm/s at well GAF-541U (sandy clay) to 9.5E-05 cm/s at well S3 (silty sand). The geometric mean of the unconsolidated material hydraulic conductivity is 8.1E-06 cm/s. Some sand layers described in boring logs would be expected to have a higher hydraulic conductivity than the range reported on **Table 3-2** for unconsolidated material, for example, sand layers in boring NRS007 that are described as fine, loose, moist, with little silt and clay.

Table 3-2 also summarizes the hydraulic conductivity of saturated units in contact with the unconsolidated material. The CCR that overlies the unconsolidated material at the NRS has a higher hydraulic conductivity than the unconsolidated material, ranging from 3.0E-02 cm/s to 6.7E-05 cm/s, with a geometric mean of 4.5E-04 cm/s.

The limited extent of Carters Limestone in the NRS area is not water-bearing based on observations during drilling of monitoring well GAF-438L, including visual logging, geophysical logging (caliper, gamma, resistivity, and conductivity), and pump-in and pump-out packer tests. No suitable location for a well screen was identified in the Carters Limestone at this location. It is described as a hard, medium gray, biomicritic limestone with a trace of mudstone, and several small weathered fractures to 410 ft msl. Groundwater is present in the Carters Limestone just north and northeast of the NRS.

The Lebanon Limestone in the NRS area is water-bearing, but only in several discrete fractures or fracture zones (Section 1.3.3), and those fractures have a low hydraulic conductivity in the NRS area. The same methods used for assessing fractures in the Carters Limestone were employed while drilling through the Lebanon Limestone. There are seven wells screened in the Lebanon Limestone at the NRS area (**Figure 3-1**). The Lebanon wells, except for monitoring well GAF-526L which is screened over 70 feet beneath the unconsolidated material, have poor well yield during groundwater sampling. A slug test performed at Lebanon monitoring well GAF-441L has an estimated low hydraulic conductivity of 2.2E-06 cm/s (**Table 3-2**).

3.4 Vertical and Horizontal Groundwater Flow Pathways

Groundwater flow is downward from the unconsolidated deposits to bedrock in the hydraulically upgradient area near the coal yard, based on hydraulic head differences measured in well pair GAF-441U (489.46 ft msl) and GAF-441L (488.85 ft msl) in June 2020 (**Figure 3-1**). This downward vertical gradient is consistent throughout the year (**Table 3-1**). Near the Cumberland River, groundwater flow is upward from the Lebanon Limestone to the unconsolidated deposits, based on hydraulic head differences measured in well clusters 20/27 and 19R/S3/GAF-526U/26, but is downward at well cluster GAF-448U/448L (**Figure 3-1**). There is also a strong downward hydraulic gradient from the shallow to deeper portions of the Lebanon Limestone, based groundwater elevations measured at wells 26 (458.75 ft msl) and GAF-526L (444.82 ft msl) in June 2020. These vertical gradients are consistent throughout the year (**Table 3-1**). Cross section A-A' on **Figure 3-3** illustrates the vertical and horizonal groundwater flow components from the coal yard through the well 19R area to the river. The cross section location is shown on **Figure 3-1**.

Recharge to the unconsolidated deposits occurs in the coal pile/coal yard area. Water is regularly applied to the coal pile to suppress dust and reduce ignitibility. Excess water ponds around the toe of the coal pile. This water combined with natural precipitation infiltrates through the fill and into the underlying alluvial deposits. As shown on **Figure 3-3**, groundwater flows laterally through the alluvium downgradient, likely through clayey sand lenses and layers. On approaching the river, groundwater flows upward through the alluvium and discharges into the river. Also, groundwater flows upward from the shallow Lebanon Limestone into the alluvium near the river.

Clayey sand layers and lenses encountered during drilling are shown on cross section A-A' (**Figure 3-3**). Based on investigations to date and as illustrated on cross section A-A', there is no boring log evidence of clayey sand layers that connect the primary pyritic sulfur area near the coal yard to downgradient wells 19R and S3. EC logs were added to the cross section to potentially assist in delineating more coarse-grained and potentially more permeable layers represented by a response to the left on the EC log from the less permeable clayey zones represented by a response to the right. Hydraulic conductivity values, where available, are also posted along the cross section to show permeability contrasts. The EC response to the left (potentially more permeable matrix) appears to represent a wide range of hydraulic conductivity values from 1E-05 to 1E-07 cm/s, based on the nearby hydraulic conductivity values derived from hydraulic testing. Therefore, the EC logs did not prove highly useful for distinguishing the more permeable clayey/silty sand layers from the less permeable sandy/silty clay layers.

Cross section B-B' on **Figure 3-4** illustrates the vertical and horizontal groundwater flow components from the coal yard near monitoring well GAF-441U through the monitoring well GAF-444U area to the discharge channel. Similar to hydrogeologic cross section A-A', recharge to the alluvium occurs in the coal yard area from infiltration of water applied to the coal pile and natural precipitation. There is a downward hydraulic gradient through the alluvium to bedrock, based on hydraulic head data collected at well cluster GAF-441U/541U/441L. Groundwater flows laterally downgradient through the alluvium toward the river.

Additional hydrogeologic detail is shown along cross sections C-C', D-D', and E-E', which are transects oriented approximately along potentiometric contours and are perpendicular to groundwater flow in areas where groundwater with low pH and elevated metals is observed. **Figure 3-1** shows the cross section locations. Available lithology data, EC logs, and hydraulic conductivity values are posted on these cross sections. Section C-C' (**Figure 3-5**) illustrates hydrogeologic conditions in the primary pyritic sulfur area between the coal yard and the CYRD. Cross section D-D' (**Figure 3-6**) illustrates hydrogeologic conditions encountered along the perimeter dike in the well 444U area near the discharge channel. In addition to EC profiles, relative permeability profiles derived from the HPT tool are also shown. Although the HPT tool was reasonably useful in identifying relative changes in hydraulic conductivity within a borehole to target groundwater sampling, the correlation of more permeable layers between borings appears limited. Cross section E-E' (**Figure 3-7**) illustrates hydrogeologic conditions along the perimeter dike in the well 19R area using data collected during the 2015 field investigation.

The hydraulic head in the CCR and the underlying unconsolidated material are consistently different, based on review of data from four paired well locations with one well screened in CCR and the other in unconsolidated material (paired monitoring wells GAF-439A/439U, GAF-440AR/440U, GAF-442A/442U, and GAF-489A/489U). The hydraulic head in the two most northern well pairs (GAF-439A/439U and GAF-440AR/440U) is consistently higher in the unconsolidated material than the CCR by 1 to 2 feet. The hydraulic head in the two most southern well pairs (GAF-489A/489U and GAF-442A/442U) is consistently higher in the CCR than the unconsolidated material by 1 to 3 feet in well pair GAF-489A/489U and 19 feet in well pair GAF-442A/442U. The hydraulic communication between the CCR

and unconsolidated material (i.e., flow into or out of the CCR) is limited by the presence of low hydraulic conductivity clay layers between the CCR and the water-bearing clayey sand layers. CCR porewater at monitoring well GAF-442A appears to be perched with limited drainage to the underlying unconsolidated material, given the large hydraulic head difference between the CCR and the unconsolidated material.

3.5 Groundwater Velocity and Travel Time

Groundwater velocity (average linear velocity) and travel time were estimated along flow paths A-A' and B-B' from the CYRD to monitoring wells 19R and GAF-444U, respectively. An estimated range for each flow path was made using two different sets of assumptions: 1) that the hydraulic conductivity is represented by the bulk geometric mean of the values for unconsolidated material at the NRS (bulk average value) and 2) that groundwater flow is occurring through interconnected clayey sand layers with a hydraulic conductivity represented by the average estimated values at wells 19R and S3. Actual groundwater flow paths likely consist of a combination of migration through more permeable (sandier) layers and bulk flow through sections of alluvium where such pathways are not prevalent.

The parameters and equations used for estimating groundwater velocity and travel time are as follows:

Hydraulic conductivity = K
Pathway distance = d
Hydraulic gradient = i
Effective porosity (assumed) = n_e
Specific discharge (q) = Ki (per unit width and depth of aquifer)
Groundwater velocity (v) = q/n_e
Travel time (t) = d/v

The bulk average groundwater velocity and travel time were estimated first as follows:

Parameter		Pathway A-A' (CYRD to 19R)			Pathway B-B' (CYRD to GAF-444U)		
Hydraulic Conductivity	(K)	0.023 ft/d	=	8.1E-06 cm/s	0.023 ft/d	=	8.1E-06 cm/s
Pathway Distance	(d)	1,200 feet			850 feet		
Hydraulic Gradient	(i)	0.037 ft/ft			0.045 ft/ft		
Effective Porosity	(n_e)	0.15 unitless			0.15 unitless		
Specific Discharge	(q)	8.5E-04 ft/d	=	0.31 ft/yr	1.0E-03 f/d	=	0.38 ft/yr
Groundwater velocity	(v)	5.7E-03 ft/d	=	2.1 ft/yr	6.9E-03 ft/d	=	2.5 ft/yr
Travel Time	(t)	2.1E+05 d	=	580 yr	1.2E+05 d	=	338 yr

d – per day
ft/yr – feet per year
yr – per year

The results above illustrate that the bulk groundwater velocity is not realistic, because the long travel time (580 years for pathway A-A' and 338 years for pathway B-B') for solute originating in the primary pyritic sulfur area to reach the NRS perimeter wells where low pH and elevated metals have been detected, greatly exceed the operational lifetime of the GAF plant. For this to be a viable pathway solute transport would need to be controlled by more permeable preferential pathways in the unconsolidated material.

Thus, groundwater velocity and travel time were estimated assuming that groundwater flow is through interconnected clayey sand layers with a hydraulic conductivity represented by the average estimated values at wells 19R and S3 as follows:

Parameter		Pathway A-A' (CYRD to 19R)				Pathway B-B' (CYRD to GAF-444U)			
Hydraulic Conductivity	(K)	0.20	ft/d	= 7.1E-05	cm/s	0.20	ft/d	= 7.1E-05	cm/s
Pathway Distance	(d)	1,200	feet			850	feet		
Hydraulic Gradient	(i)	0.037	ft/ft			0.045	ft/ft		
Effective Porosity	(n_e)	0.15	unitless			0.15	unitless		
Specific Discharge	(q)	7.4E-03	ft/d	= 2.7	ft/yr	9.1E-03	f/d	= 3.31	ft/yr
Groundwater velocity	(v)	5.0E-02	ft/d	= 18.1	ft/yr	6.0E-02	ft/d	= 22.0	ft/yr
Travel Time	(t)	2.4E+04	d	= 66	yr	1.4E+04	d	= 39	Yr

Based on the results above, solutes originating in the primary pyritic sulfur area would reach the NRS perimeter wells where low pH and elevated metals exist in 66 years along pathway A-A’ and 39 years along pathway B-B’, a more realistic timeframe than the estimate derived assuming a bulk average hydraulic conductivity. Therefore, for the source of low pH groundwater in perimeter wells 19R and 444U to be from the coal yard and CYRD area, there must be preferential pathways in the unconsolidated materials at least as permeable as the sand encountered at wells 19R and S3.

4. Non-Registered Site Soil and Groundwater Geochemistry

The following sections present the key components of the geochemical CSM. The groundwater and soil sampling analytical results are presented first in Sections 4.1 and 4.2. Section 4.3 (Geochemistry Along Groundwater Flow Paths) integrates the geochemistry and hydrogeology results into an updated CSM, providing an interpretation of conditions that may have promoted acid generation and migration of low pH groundwater from the primary pyritic sulfur area to the NRS perimeter, while dissolving metals from soil along the flow path.

4.1 Groundwater Analytical Results

4.1.1 2020 Well Sampling Analytical Results

As part of the 2020 field investigation, 12 existing monitoring wells screened in the unconsolidated material were sampled a total of five times (January, April, June, August, and October) and the two new wells screened in unconsolidated material were sampled four times (April, June, August, and October).

The field investigation groundwater sampling coincided with a portion of the NRS quarterly compliance monitoring events that included sampling of three existing unconsolidated material monitoring wells (19R, 20, and 22) and two Lebanon wells (26 and 27). The compliance sampling analytical results are reported and discussed in this section along with the 2020 field investigation results. The additional compliance sampling events discussed here include July 2020 for the three unconsolidated material wells and January, April, July, and October for the two Lebanon wells.

Table 4-1 provides the field and laboratory analytical results for the 2020 well sampling events described above. Dissolved analytical results for the four target metals (beryllium, cadmium, lithium, and nickel) and pH are presented in map view on **Figure 4-1a**. The data indicate that concentrations of the target metals are present at concentrations above GWPS and coincident with low pH (less than 5) in unconsolidated material in the southern portion of the NRS. Target metal concentrations exceeding GWPS and low pH values are observed only in unconsolidated material monitoring wells 19R, S3, GAF-441U, and GAF-444U. In the six monitoring wells that have not been previously sampled (Section 2.4.2), no target metals exceeded GWPS and no low pH groundwater was observed. No additional groundwater impacts were discovered in unconsolidated material beneath the central portion of the NRS or deeper in the unconsolidated material at new wells GAF-541U and GAF-526U. Dissolved target metal concentrations and pH readings were relatively consistent throughout 2020, as shown in the time-series graphs for beryllium (**Figure 4-2a**), cadmium (**Figure 4-2b**), lithium (**Figure 4-2c**), nickel (**Figure 4-2d**), and pH (**Figure 4-2e**). The pH measured in monitoring wells 19R, S3, GAF-441U, and GAF-444U ranged between 2.72 and 4.47, not including the anomalous value of 6.5 measured in the field at well GAF-444U during the August 2020 sampling event. No other monitoring wells in the NRS displayed pH values below 5.0. The pH reading for well GAF-444U obtained in the field in August 2020 is understood to be an instrument error, as the groundwater was re-tested on receipt by AECOM's treatability laboratory and was found to have a low pH typical for that well. Of the four low pH wells, the pH is generally lowest at monitoring well GAF-441U, which is located in the primary pyritic sulfur area, and highest at well GAF-444U.

There are differences in the chemistry among the four monitoring wells with low pH. Concentrations of lithium in excess of GWPS were detected only in monitoring well 19R. Lithium concentrations detected in monitoring well S3, which is located approximately 35 feet from monitoring well 19R and has a partially overlapping screen interval within the same sandy deposit, were not above GWPS. While pH is lowest and concentrations of the other target analytes are highest at monitoring well GAF-441U, there is not a consistent pattern among the downgradient monitoring wells regarding which well has the highest concentration of target analytes. While nickel concentrations are markedly higher at monitoring well GAF-444U than at monitoring wells 19R and S3, beryllium concentrations are highest at monitoring well 19R and lowest at monitoring well S3, and cadmium concentrations are higher at monitoring wells GAF-444U and S3 than at monitoring well 19R. The specific mechanisms that produce this variability is not known.

4.1.2 2020 In Situ Groundwater Sampling Analytical Results

A total of 17 groundwater samples were collected in situ during DPT drilling in 2020. Five of the samples were collected in the well GAF-444U area on the south NRS perimeter, and 12 samples were collected in the primary pyritic sulfur area. The samples were analyzed in the field for pH, DO, ORP, specific conductance, and temperature, and, when sufficient sample volume was available, in the laboratory for dissolved and total target metals. Two in situ sample intervals in the primary pyritic sulfur area produced only enough water for field measurements. Due to the low

permeability in the monitoring well GAF-444U area, only a limited number of samples could be obtained from the DPT borings. Seven unsuccessful attempts were made to collect groundwater samples in this area (**Table 2-6**). The field and laboratory analytical results of the in situ groundwater sampling are presented on **Table 4-2a**. Dissolved analytical results for the four target metals (beryllium, cadmium, lithium, and nickel) and pH are presented in map view on **Figure 4-1b**.

The groundwater samples collected in situ from open soil borings were visibly very turbid, and consequently the total metals concentrations are much higher than the dissolved concentrations on **Table 4-2a**. Even many of the filtered samples appeared cloudy, indicating that suspended solid breakthrough occurred during field filtration. Given the visible presence of suspended solids, which is known to contain the target analytes, the analytical results are not considered representative of groundwater, but were rather used as a screening assessment. While detected concentrations exceeded one or more target metal GWPS in 10 of the 15 in situ samples analyzed by the laboratory, only one sample had a pH less than 5.0. Given that well sampling results indicate that dissolved metals are typically only present in excess of GWPS where pH is less than 5.0, the GWPS exceedances are considered artifacts of the suspended solids. The absence of low pH groundwater in the in situ samples may indicate that impacted groundwater occurs variably in discrete more permeable layers, such as the clayey sand layers observed in the screened intervals of monitoring wells 19R, S3, and GAF-441U where the pH buffering capacity may be limited. These slightly more permeable layers do not appear to be widely distributed.

4.1.3 2015 In Situ Groundwater Sampling Analytical Results

During the 2015 NRS field investigation, 25 groundwater samples were collected in situ from DPT borings located across the NRS for field pH analysis, and for field (Hach kit) testing for ferrous iron in nine samples. These results are integrated into the interpretations and discussions in Section 4.3 (Geochemistry Along Groundwater Flow Paths). The 2015 in situ pH and ferrous iron results are presented on **Table 4-2b**.

4.1.4 Historical Coal Combustion Residuals Porewater Analytical Results

CCR porewater was collected across the NRS from wells GP-1 through GP-6 in September 2011 and analyzed for field parameters and total metals, and again in 2015 for field pH analysis only. CCR wells GAF-439A and GAF-440AR were sampled in January 2017 for analysis of field parameters and total and dissolved metals. The field parameters and laboratory results for target metals and iron are provided in **Appendix F**. Based on these results, the CCR porewater pH is predominantly slightly acidic to basic, ranging from 5.8 to 10.4, with most pH values greater than 7 (basic). The slightly acidic porewater was almost entirely observed in the shallow portion of the CCR. Both dissolved and total target metals concentrations are below the unconsolidated material GWPS, except for a lithium concentration in one sample of 48 micrograms per liter (µg/L) that slightly exceeds the GWPS of 40 µg/L. These data support that a large portion of the NRS CCR is not likely the source of low pH and elevated metals in groundwater.

4.2 Soil Analytical Results

4.2.1 Summary of Soil Sample Collection and Analysis in 2015 and 2020

During the 2015 NRS field investigation, grab soil samples were collected from 34 DPT boring locations drilled across the NRS (borings NRS001 through NRS050, **Figure 2-1**). Paste pH was analyzed in the field on 584 soil samples and 191 samples were tested for ABA in the laboratory. Multiple step-off borings were drilled at some of the DPT locations with soil data collected from each co-located boring. Review of these data informed the design of the soil sampling and analysis program for the 2020 field investigation.

Sample collection and analyses completed for the 2020 field investigation is summarized on **Table 2-2**. In summary, grab soil samples were collected from 15 DPT borings drilled in the primary pyritic sulfur area near monitoring well GAF-441U and on the south perimeter dike near well GAF-444U. Paste pH was analyzed on 169 soil samples in the field. Laboratory analysis was performed on 63 soil samples for ABA and 30 samples for metals and general chemistry. The same laboratory analyses were performed on the bulk soil collected for the laboratory treatability test. **Table 4-3** presents the field paste pH results and **Table 4-4** presents the ABA results for the 2015 and 2020 investigations. **Table 4-5** presents the soil chemical results for the 2020 investigation. In addition, sequential extraction and x-ray diffraction analyses was performed on the bulk soil, with results presented in **Table 4-6** and **Table 4-7**, respectively.

A discussion of the analytical results for soil paste pH, ABA, and general chemistry is provided in Sections 4.2.2 and 4.2.3. Further interpretation of these results in the context of site hydrogeology and groundwater flow paths is presented in Section 4.3. The interpretation and discussion of the sequential extraction and x-ray diffraction results of the bulk soil will be presented under separate cover in the Treatability Study Report.

4.2.2 Soil Paste pH and Acid-Base Accounting Results

Paste pH shows whether a soil sample is presently acidic. The 2015 and 2020 soil pH values range from 2.3 to 10.5. Of the 708 soil samples, 168 were collected from soil core intervals that fully or partially contained CCR (24 percent) and the remaining 540 sample represented unconsolidated material (native soil, disturbed native soil, or fill). There were 262 samples with a pH < 5 (37 percent), and 35 of these samples were collected from core that fully or partially contained CCR (13 percent of the low pH samples). Soil pH of 9 or above was most commonly found in CCR material. Based on these soil pH results, the native alluvium and fill tend to be more acidic than CCR, except near the bedrock contact, where the alluvium or residuum (if present) pH becomes more neutral given the buffering capacity of the limestone and dolomite beds.

ABA is an analytical method used to predict whether a sample has the potential to generate or neutralize acid in the future. It measures both the acid generation potential (AGP), based on the sulfur species present, and the acid neutralization potential (ANP), based on titration. The reporting units are in tons of calcium carbonate ($CaCO_3$) equivalent/kiloton of rock, abbreviated as t $CaCO_3$/kt or simply t/kt.

Two criteria are typically used to define whether a material is considered an acid generator based on ABA analysis, using ANP and AGP (United States Environmental Protection Agency [USEPA], 1994). The first criterion is the ANP/AGP ratio, referred to as the neutralization potential ratio (NPR). If the NPR is < 1, then the rock is considered potentially acid generating (PAG); if the ratio is > 3, the rock is considered non-acid generating (NAG). If 1 ≤ NPR ≤ 3, then the acid or neutralizing potential of the rock is uncertain.

The second criterion is the net neutralization potential (NNP), where NNP = ANP – AGP. If the NNP is < -20 t/kt, then the rock is considered PAG; if it is > +20 t/kt, it is considered NAG. If -20 t/kt ≤ NNP ≤ +20 t/kt, then the NNP of the rock is uncertain.

The NPR tends to be a better indicator when both ANP and AGP are greater than about 10 to 20 t/kt. The NNP is sometimes a poor indicator in this case because it can reflect small differences between large numbers. On the other hand, at small values of ANP and AGP (i.e., <10 t/kt), small changes or uncertainties in one or the other of ANP or AGP can result in large changes of the ratio. **Table 4-4** identifies PAG, NAG, and uncertain status based on the criteria above. Only 8 of the 191 NPR results would be the best indication of acid generating potential, thus NNP is used as the key indicator for PAG and NAG in this Report.

It should be noted that that the concentration of pyritic sulfur in a rock is not in itself an indicator of acid generation. Rock with less than 0.5 percent sulfur content (i.e., an AGP of 15 t/kt) can produce acidic drainage if the rock does not have sufficient, or sufficiently available, carbonate (ANP) for neutralization. However, a higher pyritic sulfur content does imply a higher total potential loading of pyrite oxidation products, which can generate acidic conditions.

Of the 191 soil samples analyzed for ABA (including both unconsolidated material and CCR), 28 were PAG, 23 were NAG, and 140 were uncertain (**Table 4-4**). The 28 PAG samples were located primarily in or near the primary pyritic sulfur area to depths of 25 ft bgs but most were in the upper 5 to 10 feet. A few PAG samples were within the NRS interior and on the south perimeter dike in the upper 10 feet. **Figure 4-1c** shows the location of soil samples designated as PAG and the maximum depth of samples at that location designated as PAG.

The majority of the PAG samples (22 of the 28) were collected from soil core characterized as CCR or CCR/soil mix. The remaining six PAG samples characterized as soil were shallow (10 feet or less) and located close (vertically or laterally) to CCR, thus it is suspected that these samples were a mixture of CCR and soil. Nine of the CCR samples were NAG. **Figure 4-3** provides a display of NNP values versus depth for different NRS areas, including site-wide across the NRS, in the CYRD area, in the southern perimeter dike area, and the western dike area.

The pyritic sulfur mass fraction ranged from <0.01 to 3.72 percent by weight (% wt). **Figure 4-4** provides a display of pyritic sulfur mass fraction versus depth for the different NRS areas. Samples with the highest detected pyritic sulfur typically coincided with PAG sample locations and were in or near the primary pyritic sulfur area, and at depths of 0 to 30 feet, except for the following four locations (**Figure 4-1c**):

- NRS050 located 100 feet southwest of the primary pyritic sulfur area (from 9 to 11 feet and 29 to 30 feet)
- NRS040 located 500 feet southwest of the primary pyritic sulfur area (from 5 to 10 feet)
- NRS017 located on the perimeter dike 300 feet south of monitoring well 19R (from 16.5 to 17.5 feet)
- NRS048 located on the perimeter dike 150 feet southwest of monitoring well GAF-444U (from 5.5 to 6 feet and 9 to 11 feet)

Therefore, PAG material, although concentrated in the primary pyritic sulfur area, appears to have been also co-disposed in the other locations of the NRS, but to a much lesser extent.

4.2.3 Metals and General Chemistry Results

Two soil samples were collected from each of the 15 DPT borings for metals and general chemistry analysis. In the primary pyritic sulfur area, one soil sample was collected from the unsaturated zone and the other from the saturated zone at each location. In the monitoring well GAF-444U area on the south perimeter dike, soil sample depths were staggered above and below the water table to cover a range of depth intervals along the transect of DPT borings. Also, one sample aliquot of bulk soil material was collected at each sonic boring NRS068, NRS069, and NRS070 and analyzed for metals and general chemistry, as described in Section 4.2.1. The soil analytical results are presented on **Table 4-5**.

Target metal mass fraction ranges in the soil samples are summarized below:

Material Type Collected	Beryllium (mg/kg)	Cadmium (mg/kg)	Lithium (mg/kg	Nickel (mg/kg)
Core intervals with CCR or a portion of CCR (7/33 soil samples)	0.756 to 2.09	0.137 to 3.16	3.25 to 13.6	8.25 to 27.7
Core intervals with unconsolidated material (26/33 soil samples)	0.208 to 1.97	<0.186 to 3.01	3.90 to 20.2	4.74 to 30.9

mg/kg – milligrams per kilogram

Based on the soil results above, the unconsolidated soil and CCR samples have a similar target metals mass fraction.

4.3 Geochemistry Along Groundwater Flow Paths

4.3.1 Geochemical Characterization in the Primary Pyritic Sulfur Area

The primary pyritic sulfur area shown on **Figure 4-1c** is suspected to be the key source of acid generation at the NRS based on the following characteristics:

- It is known that high sulfur coal was used at GAF for many years and that pyrite or mill rejects were sluiced to the NRS and co-disposed with CCR in the earlier period of operation (TVA, 1967). This practice occurred at other power plants across the eastern United States, as discussed by Electric Power Research Institute (EPRI) (1995).
- The primary pyritic sulfur area is near the historic coal pile and ash sluice discharge where heavier pyrites were most likely to have settled out (see **Figure 1-4**).
- Pyritic sulfur was detected in CCR samples at some of the highest mass fractions (up to 3.02%) in this area of the NRS (**Table 4-4**).
- The majority of the CCR samples in this area were characterized as PAG. Seven of the nine CCR samples were characterized as PAG and two were NAG (**Table 4-4**).
- PAG CCR with pyritic sulfur exists in both the unsaturated and saturated zone in this area and extends to the native alluvium to depths of up to 25 ft bgs. This is deeper than found at other locations in the NRS where PAG exists (**Figure 4-1c**).

The characteristics and conditions described above provide a setting conducive to acid generation and downward percolation of acidic seepage to the underlying native alluvium in the primary pyritic sulfur area. The weathering of pyrite in the presence of oxygen, moisture, and microbes in the vadose zone can produce low pH seepage. This

process may be enhanced by the moisture that is regularly applied to the coal pile in the area. Low pH seepage that percolates downward into saturated CCR is not neutralized in this area because the saturated CCR is PAG. PAG CCR is typically shallower (and unsaturated) at other locations throughout the NRS (**Figure 4-1c**), thus there is greater potential at those locations for acid neutralization during downward seepage through the CCR.

Low pH seepage can enhance the dissolution of metals present in soil. Leaching of metals can occur both in proximity to the pyritic source of acidic seepage and in downgradient materials through which acidic groundwater flows. While the acidic groundwater is understood to be caused by pyrite oxidation, the elevated metals can originate from soil minerals. Beryllium, cadmium, lithium, and nickel can be adsorbed onto soil minerals or more strongly bound into the structure of minerals making up soil. Under acidic pH conditions, these constituents may desorb or be released due to destabilization of the mineral structure.

During construction to line the CYRD in 2019, dark orange-red seeps formed along an embankment cut on the east ditch wall (coal yard area side) just above the bottom of the ditch generally between the location of monitoring wells GAF-441U and GAF-440AR in the primary pyritic sulfur area (**Figure 4-1c**). This coloration suggests that the water seeping from this cut contained dissolved ferrous iron, which was oxidized and precipitated as orange-red iron oxyhydroxide upon exposure to the atmosphere. This observation is consistent with what would be expected if acid-generating soil (or CCR) were present in this area, as acidic groundwater containing ferrous iron could then be produced under these conditions. The cut was backfilled at the completion of construction activities to upgrade the ditch. The orange-red seeps were not observed on the west ditch wall cut, which is adjacent to the NRS CCR disposal area.

Soil and groundwater geochemical data are posted on cross section C-C' to show subsurface geochemical characteristics in the primary pyritic sulfur area (**Figure 4-5**). The cross section location is shown on **Figure 3-1**. PAG soil samples are indicated by red dots, NAG samples by green dots, and uncertain acid generation (between PAG and NAG) by purple dots. Qualitative soil pH ranges are shown by a red square if the soil pH is ≤5, a green square if pH ≥6, and a purple square if pH is between 5 and 6. Pyritic sulfur mass fraction ranges are shown with a red "S" for the highest values (0.37 to 3.72% wt), a green "S" for the lowest values (<0.03% wt), and a purple "S" for medium values (0.03 to 0.29% wt). No pyritic sulfur values were between 0.29 and 0.37% wt.

Within the primary pyritic sulfur area, low pH and elevated metals in groundwater were observed only in monitoring well GAF-441U and adjacent boring NRS060. In situ groundwater samples outside the immediate area of monitoring well GAF-441U had neutral pH (**Figure 4-1b**). Although some of the samples had elevated dissolved metals, they are expected to be a sampling artifact related to suspended solids in the samples (Section 2.2.2). The absence of acidic groundwater outside monitoring well GAF-441U area suggests that acid generation is not currently widespread throughout the primary pyritic sulfur area; however, the presence of shallow PAG soil in the area suggests that there is potential for acid generation to occur should conditions become favorable. The native alluvium in this area has little capacity to neutralize acidic water except in some locations near the bedrock contact where soil becomes NAG.

4.3.2 Geochemical Characterization Along the South and Southwest Perimeter Dike

Soil and groundwater geochemical data are posted on cross sections D-D' (**Figure 4-6**) and E-E' (**Figure 4-7**) to display subsurface geochemical characteristics along the perimeter dike in the area of monitoring wells GAF-444U and 19R, respectively. The cross section locations are shown on **Figure 3-1**.

The south perimeter dike in the monitoring well GAF-444U area had very little pyritic sulfur in soil samples above and below the water table (**Figure 4-6**). Acid generating conditions are predominantly uncertain (based on NNP). Low pH and elevated metals in groundwater are limited to the location and screen depth of monitoring well GAF-444U. Although some of the in situ groundwater samples had elevated dissolved metals, they are understood to be a sampling artifact related to suspended solids in the samples (Section 2.2.2).

The southwest perimeter dike in the monitoring well 19R area had no detected pyritic sulfur in soil samples above and below the water table (**Figure 4-7**). Acid generating conditions are predominantly uncertain (based on NNP). Low pH and elevated metals in groundwater appear to be limited to the location and screen depth of monitoring wells 19R and S3 and nearby boring NRS007.

Based on the available geochemical data, there does not appear to be a local source of acid generating conditions along the south and southwest perimeter dikes, other than the isolated shallow PAG soil identified at borings NRS018S and NRS048S (**Figure 4-1c**), which may be influenced by CCR. Available NNP data in the unconsolidated

material (dike fill and native alluvium) shown on cross sections D-D' and E-E' is within the uncertain range (between PAG and NAG), thus it cannot be determined if this soil has a potential to produce acid or neutralize acid.

4.3.3 Geochemistry Along Groundwater Flow Paths A-A' and B-B'

The primary pyritic sulfur area is hydraulically upgradient of groundwater impacts at NRS perimeter monitoring well 19R along groundwater flow line A-A' and monitoring well GAF-444U along groundwater flow line B-B', as shown on **Figure 3-1**. Perimeter monitoring wells 19R and GAF-444U are approximately 1,200 feet and 850 feet from the primary pyritic sulfur area, respectively. For low pH groundwater to travel from the primary pyritic sulfur area to the NRS perimeter in the timeframe of NRS operations, transport must be through more permeable clayey sand layers, as noted in Section 3.5. Clayey sand layers ranging in thickness of less than 1 to 10 feet have been observed in many of the NRS borings, but correlation of these layers over distances greater than 5 to 10 feet has not been observed. This spatial variability suggests that sandy deposits exist in pockets or in channels through the alluvium, which are limited in lateral extent and therefore difficult to reliably intercept with a boring. Hydraulic conductivity of the sandy materials has been tested only at monitoring well pair 19R and S3, and the average value is 7.1E-05 cm/s (0.20 ft/d). Based on this single hydraulic conductivity value, the average groundwater velocity through sand is approximatly18 ft/yr along flow path A-A' and 22 ft/yr along flow path B-B' (Section 3.5). Soil and groundwater geochemical data are posted in cross sectional view along flow paths A-A' and B-B' to show subsurface geochemical characteristics from the primary pyritic sulfur area to NRS perimeter monitoring wells 19R (**Figure 4-8**) and GAF-444U (**Figure 4-9**), respectively.

The exceedance of the lithium GWPS of 40 µg/L in deep Lebanon monitoring well GAF-526L (**Figure 4-8**) is not related to the NRS. Lithium naturally occurs in the Lebanon Limestone and a more suitable GWPS is based on background concentrations calculated as an upper prediction limit of 189 µg/L for the Lebanon Limestone from the CCR Rule background monitoring well baseline data. AECOM prepared an Alternate Source Demonstration (ASD) on behalf of TVA demonstrating that the lithium in GAF-526L is naturally occurring and not related to the NRS. The ASD document is provided in **Appendix G**.

Along groundwater flow paths A-A' and B-B', recharge in the coal yard infiltrates and contacts shallow pyritic sulfur in the vadose zone, producing acidic seepage that infiltrates downward to the saturated zone. The acidic groundwater flows downward and laterally away from the primary pyritic sulfur area hydraulically downgradient toward the river. There is little neutralizing capacity in the unconsolidated material along the flow path, except where bedrock residuum may be present, such as at NRS008S along flow line B-B' (**Figure 4-9**). The acidic groundwater can dissolve metals and other constituents along the flow path, while preferentially migrating through discrete more permeable layers such as clayey sand layers.

The geochemistry along the groundwater flow path to the NRS boundary is likely variable and influenced by multiple factors related to saturated zone heterogeneity, distribution of PAG and NAG material throughout the subsurface, moisture conditions, and oxygen content. As groundwater encounters layers of NAG material, the pH in the groundwater may rise and metals may precipitate or adsorb. Along other portions of the flow path, additional acidity may be added to the flow system from other PAG sources in the overlying vadose zone such as at borings NRS050 and NRS040 along flow path A-A' (**Figure 4-8**).

5. Summary and Conclusions

5.1 Study Objectives and Accomplishments

The primary goals of the NRS field investigation were to collect data to support laboratory and field treatability tests to evaluate technologies to remediate low pH and elevated metals in groundwater, and to update the hydrogeologic and geochemical CSM. The field investigation was conducted from January through October 2020.

The following provides the study objectives as developed in the Work Plan (AECOM, 2019), followed by how the objective was accomplished in this study in *italics*.

Obtain additional information to incorporate into the CSM, including:

- Locate the source material producing low pH groundwater conditions.

  *The primary pyritic sulfur area shown on **Figure 4-1c** is suspected to be the key source of acid generation at the NRS, based on further chemical characterization of the NRS subsurface in this investigation. This area contains some of the highest mass fractions of pyritic sulfur (up to 3.02%), PAG material extends vertically to the top of the native alluvium, very little NAG material exists, and the area coincides with the historical storage of high sulfur coal and suspected historical sluicing of pyrite rejects.*

  Several other areas with pyritic sulfur were identified throughout the NRS and they may also be sources of acid generation; however, acid generated at these locations is more likely to be neutralized by surrounding CCR that is NAG.

- Assess the primary groundwater transport pathways between the source area and the downgradient NRS boundary.

  Comprehensive groundwater sampling and gauging were performed to gather additional subsurface data throughout the NRS. Based on these data, no groundwater impacts were observed in the NRS interior, thus a transport pathway between the primary pyritic sulfur area and impacted wells 19R and GAF-444U located on the NRS perimeter could not be confirmed. It is suspected that transport may be through discrete layers of slightly higher permeability within the predominantly clayey alluvium. Such layers are estimated to range in thickness from 1 to 10 ft and may be difficult to intersect with borings and wells.

- Estimate groundwater velocity and solute travel times through unconsolidated deposits beneath and around the NRS.

  Hydraulic testing was conducted in eight monitoring wells screened in unconsolidated material to update hydraulic conductivity values, hydraulic head and gradient data were collected and reviewed, and existing available hydrogeologic data were incorporated into the evaluation. The unconsolidated material was confirmed to contain abundant clay and silt and a low overall hydraulic conductivity, ranging from 9.2E-07 to 9.5E10-5 cm/s. Groundwater velocity and travel times were estimated for a range of conditions using these data.

  An important finding of this effort is that for groundwater with low pH to migrate to NRS perimeter monitoring wells 19R and GAF-444U from the primary pyritic sulfur area in the vicinity of monitoring well GAF-441U, there must be preferential pathways in the unconsolidated material at least as permeable as the clayey sand encountered at monitoring wells 19R and S3.

  Assuming a hydraulic conductivity value representative of clayey sand, the groundwater velocity would be approximately 18 ft/yr and 22 ft/yr along the flow path from the primary pyritic sulfur area to wells 19R and GAF-444U, respectively, corresponding with a travel time of 66 years and 39 years, respectively.

- Obtain data to calculate solute flux in potential field demonstration areas (near wells 19R and GAF-444U).

  Groundwater concentration, hydraulic conductivity, hydraulic head and gradient, and saturated zone thickness data were collected in the areas of wells 19R and GAF-444U in the 2015 and 2020 field investigations. These data can be used to calculate solute flux in the potential field demonstration areas.

- Obtain data to assess the feasibility of various remedial amendment delivery mechanisms (i.e., direct injection, soil mixing, etc.).

Hydraulic conductivity data, detailed logging of lithology, and chemical characterization of unsaturated and saturated zone soil and groundwater support evaluations of remedial amendment delivery mechanisms. These evaluations are part of the treatability studies that will be reported under separate cover.

- Assess the extent of impacts requiring treatment near the NRS by performing comprehensive sampling of existing wells and focused soil testing.

  Comprehensive groundwater monitoring was performed site wide across the NRS. No new areas of groundwater impacts were identified laterally or vertically beyond areas of known groundwater impacts.

  Densely spaced soil and in situ groundwater samples were collected in DPT borings around well GAF-444U (in 2020) and well 19R (in 2015) to determine the horizontal and vertical extent of impacted groundwater directly surrounding these wells. Low pH groundwater with elevated metals was not found to extend more than 30 ft or less beyond these wells.

  Soil and in situ groundwater samples were collected in DPT borings within and surrounding the primary pyritic sulfur area to further refine the horizontal and vertical extent of the PAG material. The resulting refinement of this area is shown on ***Figure 4-1c*** *and other figures in this report.*

Obtain material for the bench-scale treatability study including:

- Groundwater and native soil representative of the low pH conditions in the alluvium
- Source material potentially responsible for generating the low pH conditions in groundwater

  Bulk soil material was collected adjacent to existing well screens that are known to yield acidic groundwater and elevated metals (wells 19R, GAF-444U, and GAF-441U). This soil was used in the bench-scale treatability study, as planned.

Provide preliminary design data for potential pilot field demonstration areas, including:

- Identify the location and extent of acid-generating source materials in an area suitable for pilot testing.
- Characterize the hydrogeology of potential treatment zones.
- Delineate the extent of metals impacts within potential field demonstration areas.
- Profile geochemical characteristics in the potential field demonstration areas.

  Data were collected during the field investigation that will support the design basis for a field demonstration located in any of the three target areas (GAF-441U, 19R/S3, and GAF-444U). These data include hydraulic conductivity, vertical extent and lithology of the saturated zone, groundwater velocity, specific discharge, travel time, groundwater concentrations, lateral and vertical extent of groundwater that exceeds GWPS, soil chemistry, and locations of acid generating material in the NRS.

5.2 Next Steps

Additional field investigations may be warranted to fill data gaps related to the field demonstration design (near-term data gap) and/or the CARA and full-scale remedial design (long-term data gap). A data gap evaluation will be performed to assess what additional field data may be required in the near-term and long-term to support site remediation activities. This evaluation will be included in a field investigation work plan that outlines an approach to fill the data gaps identified. The field investigation work plan will be prepared separately from the field demonstration work plan that is currently being developed but will address data gaps identified for the field demonstration.

6. References

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Tables

Table 1-1
Groundwater Protection Standards
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Parameter	Unit	State GWPS (a)	Federal GWPS (b)	Site-Specific GWPS (b)
Antimony	µg/L	6	6	NA
Arsenic	µg/L	10	10	NA
Barium	µg/L	2000	2000	NA
Beryllium	µg/L	4	4	NA
Cadmium	µg/L	5	5	NA
Chromium (total)	µg/L	100	100	NA
Cobalt	µg/L	NA	6	(d)
Fluoride	mg/L	4	4	NA
Lead	µg/L	15	15	NA
Lithium	µg/L	NA	40	45/189 (e)
Mercury	µg/L	2	2	NA
Molybdenum	µg/L	NA	100	NA
Nickel	µg/L	100	NA	NA
Selenium	µg/L	50	50	NA
Silver	µg/L	100	NA	NA
Thallium	µg/L	2	2	NA
Radium 226+228	pCi/L	NA	5	NA

Notes:

(a) Default published GWPS based on TN MCLs from Tennessee solid waste regulations, Appendix III (TN Rule 0400-11-01-.04). Site-specific GWPS may be developed under TN Rules (Alternate Concentration Limits, ACLs) with TDEC Approval.

(b) Default published GWPS from CCR Rule, Appendix IV (40 CFR 257.95) based on Primary MCLs for public drinking water supplies (https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations) and default values for parameters without primary MCLs. Site-specific GWPSs may be developed under the CCR Rule if background is above the default GWPS/MCL.

(c) Site-specific GWPS previously developed under State and/or CCR Rule compliance programs.

(d) TDEC approved an Alternate Source Demonstration for cobalt at the NRS; no alternate GWPS calculated.

(e) Site-specific GWPS for lithium based on background under the CCR Rule monitoring (2018 Annual Report; AECOM, 2019). First value (45 ug/l) for Carters Limestone; second value (189 ug/l) for Lebanon Limestone (L1).

Abbreviations:

µg/L = micrograms per liter
mg/L = milligrams per liter
CCR Rule = Coal Combustion Residuals Rule (40 CFR 257.95)
GWPS = Groundwater Protection Standard
MCL = Maximum Contaminant Level
NA = Not Applicable/No Site-specific GWPS established for the NRS
NRS = Non-Registered Site
pCi/L = picocuries per liter
SWR = Tennessee solid waste regulations (TN Rule 0400-11-01-.04)
TDEC = Tennessee Department of Environmental Control
TN = Tennesee

Table 2-1
Summary of Work Plan Deviations – 2020
NRS Field Investigation
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Work Plan Section No.	Work Plan Specification	Deviation in Field Investigation Report
3.2.1	Groundwater samples collected from each sampling event are to be analyzed for both total and dissolved metals.	A dissolved-fraction groundwater sample was not collected from well 19R during the June 2020 groundwater sampling event, well 20 and 22 during the July groundwater sampling event, and well GAF-541U during the October 2020 groundwater sampling event. The unfiltered sample turbidity was very low, and the total analysis would therefore be similar to the dissolved analysis.
3.2.1	Each sampling event will include a comprehensive round of groundwater potentiometric surface measurement. Groundwater elevation and CCR phreatic surface data will be collected from all wells shown within the NRS footprint, including wells screen in the Lebanon Limestone, and select wells around the perimeter of the NRS.	Well GP-3 and GP-4 could not be gauged during the February 11, 2020 gauging event and GP-3 could not be gauged on the March 16, 2020 gauging event due to ponded water. GAF-404C and GAF-404L were inadvertently not gauged during the August 17, 2020 sampling event.
3.2.2	Seven DPT soil borings, with up to five additional borings possible, will be advanced to bedrock in the vicinity of well GAF-441U, boring NRS035, the ash silos and the coal pile. The proposed borings are shown on Work Plan Figure 3-1.	A total of eight DPT borings were drilled in this area and one of the original seven boring locations was modified, with TDEC's approval. The northern most boring in the Work Plan was eliminated because neutral to basic soil and groundwater pH was encountered in three borings (NRS061, NRS062, and NRS064) located 240 to 480 feet to the south (**Figure 2-1**), which defined the likely northernmost extent of acid generating conditions in the hydraulically upgradient area. The eliminated boring was replaced with boring NRS064 to provide additional transect data along the groundwater flow path in this area. Boring NRS065 (**Figure 2-1**) was added to provide additional data hydraulically upgradient of existing well GAF-441U.
3.2.3	Hydraulic conductivity testing will be performed at GAF-440U, GAF-442U, GAF-444U, and GAF-489U via rising or falling-head (slug) tests.	Slug testing was also conducted at newly installed wells GAF-526U and GAF-541U.
3.2.4	Groundwater profiling will be conducted at up to six borings near GAF-444U using a Hydraulic Profiling Tool (HPT). Discrete groundwater samples will be collected at up to three depth intervals using a short (12 to 24-inch) sampler.	Groundwater profiling was conducted at seven borings near GAF-444U using HPT. Boring NRS067 was added on the northeast end of the transect to intersect a potential historical ground surface valley (pre-CCR). Due to lack of water, a sample was not collected at NRS052 or NRS067. At the remaining borings, only one groundwater sample could be collected due to the low permeability.

Table 2-1
Summary of Work Plan Deviations – 2020
NRS Field Investigation
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Work Plan Section No.	Work Plan Specification	Deviation in Field Investigation Report
3.2.5	Based on the results of the soil and groundwater sampling, up to six monitoring wells may be installed in the potential upgradient source area or in the vicinity of well GAF-444U.	During the field investigation, tight clayey materials were predominantly encountered, and it was difficult to find a suitable location and depth to screen a new well. Thus, two new monitoring wells were installed (see Section 2.3.2). New monitoring well GAF-541U was installed near existing well GAF-441U in the potential upgradient source area where acid generating conditions were suspected to exist, and well GAF-526 was located near existing well 19R located on the NRS southwest perimeter (**Figure 2-1**). An attempt was made to install a third new well near existing well GAF-444U on the NRS south perimeter, based on results of the direct push drilling and hydraulic profiling; but when the sonic rig was advanced to target depth for well installation, no suitable water-bearing zone was identified and the boring was abandoned.
3.3.1	Groundwater samples for treatability testing will be collected from wells 19R, GAF-441U and GAF-444U. Up to 20 gallons of unfiltered water from each well is anticipated over the course of the treatability program.	A total of 253 liters (66 gallons) was collected from wells 19R, GAF-440U, GAF-441U, GAF-444U. Water for treatability samples was collected on the following dates: January 2020 – well 19R [9 liters (L)] February 2020 – well 441U (2L) and 444U (3 L) March 2020 – wells 19R (58 L) and 444U (12 L) June 2020 – wells 19R (15 L), 441U (8 L) and 444U (20L) August 2020 – well 19R (30 L) October 2020 – wells 19R (25 L), 441U (10 L), and 444U (20L) November 2020 – well 440U (41 L)
3.3.2	An estimated 20 gallons of saturated soil, per location, will be collected from the vicinity of GAF-441U, GAF-444U, and 19R. One or more Shelby tubes will be collected per area listed above for chemical analysis.	GAF-441U vicinity: ~ 10 gallons of soil collected at NRS069 GAF-444U vicinity: ~ 20 gallons of soil collected at NRS070 19R vicinity: ~ 40 gallons of soil collected at NRS068 (two adjacent borings) One Shelby tube sample was collected each near GAF-441U, GAF-444U, and 19R. To date, the soil has not been analyzed and is in storage at AECOM's treatability laboratory in Austin, Texas.
3.4	Any excess CCR or soil remaining after sample collection will be placed back into the open boring as part of their abandonment, and excess soil may be spread at the ground surface.	Borings were abandoned to ground surface with bentonite chips. Soil and coal combustion residuals not submitted for laboratory analysis or to the AECOM treatability lab was transported to the onsite TVA Landfill.

Table 2-1
Summary of Work Plan Deviations – 2020
NRS Field Investigation
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Work Plan Section No.	Work Plan Specification	Deviation in Field Investigation Report
Appendix B, Section 5.3.1 Groundwater Profiling	Groundwater samples collected through the DPT sampler will be analyzed in the field for turbidity. Groundwater samples collected through the DPT sampler will be placed in a decontaminated protective cup associated with the multiparameter sonde and the sonde will be placed in the water sufficiently long for the readings (pH, dissolved oxygen, ORP) to stabilize. If sufficient water is present, the water will be passed through a low-flow cell to measure these parameters, consistent with low flow sampling protocols. Where low pH is observed (< 5) and sufficient groundwater yield is obtained, a field-filtered groundwater sample will be collected for analysis of beryllium, cadmium, lithium, nickel and iron. If sufficient yield is obtained, a groundwater sample will also be collected for total beryllium, cadmium, lithium, nickel and iron.	The in-situ groundwater samples were visibly very turbid. Turbidity measurements were omitted due to the limited groundwater sample volumes. pH, dissolved oxygen, and ORP were measured in the decontaminated protective cup; sufficient water was not encountered at any boring to enable use of the low-flow cell. Visible turbidity was present in filtered and unfiltered samples. All in situ samples were analyzed for total and dissolved metals, except for two samples where there was insufficient volume.
Appendix B, Section 5.3.1 pH Measurement	Field-measured aerated pH values will be collected from monitoring wells and, if sufficient water volume is available, from groundwater profiling locations	Field-measured aerated pH was not collected from the groundwater profiling locations. Due to field error, field-measured aerated pH was not collected at wells 19R, 20, GAF-447U, GAF-448U, GAF-526U, and S3 in June 2020.
Appendix B, Section 5.3.2 Field Test Kits	Groundwater samples from monitoring wells and, if sufficient water is present, from groundwater profiling locations will be field-analyzed for ferrous iron after field-filtering, for sulfide, and for carbon dioxide	Field analysis of turbidity, sulfide, ferrous iron and carbon dioxide was not conducted during groundwater profiling because there was insufficient sample volume. Field analysis of sulfide was not conducted during the January 2020 groundwater sampling event due to an instrument malfunction.
Appendix B, Section 5.3.3 Treatability Study	Groundwater for the treatability test will be placed in four-gallon collapsible plastic containers.	Groundwater for the treatability test was collected in multiple 1-liter amber bottles.
Appendix B, Section 5.4.2 Treatability Study	The treatability laboratory may collect samples for laboratory analysis for sequential extraction and x-ray diffraction (XRD).	Soil samples for sequential extraction were collected in the field at NRS068, NRS069 and NRS070. The treatability laboratory submitted samples for both sequential extraction and XRD; results will be included in the Treatability Study report.

Table 2-2
Data Collection Summary - 2020 NRS Field Investigation
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Location ID	HPT Log	Number of Shelby Tubes Collected	Bulk Soil Collected for Treatability Study	Bulk Groundwater Collected for Treatability Study	Number of Soil Samples Analyzed				Number of Groundwater Samples Analyzed		
					Field Paste pH	Acid Base Accounting	Table 2-5 Laboratory Analyses	Sequential Extraction and XRD	Field Parameters	Table 2-7 Target Metals Analyses	Table 2-7 Full List Laboratory Analyses
Wells											
20									6		6
22									6		6
19R				137 liters					8		6
GAF-439U									5		5
GAF-440U				41 liters					5		5
GAF-441U				20 liters					5		5
GAF-442U									5		5
GAF-444U				55 liters					5		5
GAF-447U									5		5
GAF-448U									5		5
GAF-489U									5		5
GAF-526U									4		4
GAF-541U									4		4
S3									5		5
Soil Borings											
NRS051	yes				8	2	2				
NRS052	yes				13	2	2		1	1	
NRS053	yes				15	2	2		1	1	
NRS054	yes				14	2	2		1	1	
NRS055	yes				15	2	2		1	1	
NRS056	yes				13	2	2		1	1	
NRS057					14	6	2		1	1	
NRS058					13	6	2		2	1	
NRS059					10	6	2		1	1	
NRS060					11	6	2		2	2	
NRS061					9	6	2		2	2	
NRS062					7	6	2		1	1	
NRS064					10	6	2		2	1	
NRS065					10	6	2		1	1	
NRS067	yes				7	2	2				
NRS068		1	40 gallons			2	1	1			
NRS069		1	10 gallons			1	1	1			
NRS070		1	20 gallons			1	1	1			

Notes:
HPT = hydraulic profiling tool
XRD = X-ray diffraction

Table 2-3
Boring Data Summary - 2015 and 2020 Field Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Boring ID	Easting	Northing	Ground Surface Elevation	Boring Depth		Top of CCR		Top of Unconsolidated Material		Top of Rock	
			(ft msl)	(ft bgs)	(ft msl)	(ft bgs)	(ft msl)	(ft bgs)	(ft msl)	(ft bgs)	(ft msl)
NRS001	1879431.7	699632.5	476.8	60.3	416.5	NE	NE	0	476.8	NE	NE
NRS001S	1879433.5	699634.6	476.8	58	418.8	NE	NE	0	476.8	NE	NE
NRS002	1879278.7	699889.0	476.6	55.6	421	NE	NE	0	476.6	NE	NE
NRS002H	1879275.0	699897.6	474.3	57	417.3	N/A	N/A	N/A	N/A	NE	NE
NRS002S	1879280.7	699893.5	476.3	56.5	419.8	NE	NE	0	476.3	NE	NE
NRS002SA	1879280.6	699890.4	476.6	59	417.55	NE	NE	0	476.6	NE	NE
NRS003	1879444.5	699820.3	472.8	54.6	418.2	1	471.8	28	444.8	NE	NE
NRS003H	1879440.3	699821.3	473.0	70	403	N/A	N/A	N/A	N/A	NE	NE
NRS004	187406.3	699791.2	472.0	59.6	412.4	1	471.0	21	451.0	NE	NE
NRS004H	1879404.4	699789.7	472.0	63	409	N/A	N/A	N/A	N/A	NE	NE
NRS005	1879434.4	699730.5	471.5	61.7	409.8	1	470.5	18	453.5	NE	NE
NRS006	1879372.6	699827.6	473.0	55.7	417.3	1	472.0	22	451.0	NE	NE
NRS007	1879365.0	699745.6	477.3	64.2	413.1	see note	see note	0	477.3	NE	NE
NRS007H	1879363.8	699753.7	474.2	80	394.2	N/A	N/A	N/A	N/A	NE	NE
NRS008	1880137.6	700370.5	504.0	91.2	412.75	9	495.0	33.7	470.3	NE	NE
NRS008H	1880142.5	700372.2	504.1	89	415.1	N/A	N/A	N/A	N/A	NE	NE
NRS008S	1880138.6	700374.6	504.0	89	415.0	11.7	492.3	33.5	470.5	NE	NE
NRS009	1880519.8	700760.4	506.6	16.4	490.2	NE	NE	0	506.6	NE	NE
NRS010	1880613.1	700751.7	506.2	18.6	487.6	NE	NE	0	506.2	NE	NE
NRS011	1880705.4	700758.6	508.6	17.9	490.7	NE	NE	0	508.6	NE	NE
NRS012	1879531.4	699847.2	472.9	25	447.9	0	472.9	13.7	459.2	NE	NE
NRS012H	1879532.5	699846.2	473.0	56	417.0	N/A	N/A	N/A	N/A	NE	NE
NRS012S	1879530.2	699844.5	473.0	51	422.0	0	473.0	15	458.0	NE	NE
NRS013	1880278.1	700195.6	504.7	76.2	428.5	8	496.7	34	470.7	NE	NE
NRS014	1880321.4	700104.4	504.9	43	461.9	9	495.9	23	481.9	NE	NE
NRS015H	1879144.1	700116.8	474.3	64	410.3	N/A	N/A	N/A	N/A	NE	NE
NRS016H	1878604.2	701054.2	472.8	58	414.8	N/A	N/A	N/A	N/A	NE	NE
NRS017H	1879504.2	699511.4	473.8	51	422.8	N/A	N/A	N/A	N/A	NE	NE
NRS017S	1879504.6	699510.3	477.6	49.5	428.1	NE	NE	0	477.6	NE	NE
NRS018H	1879842.2	699334.6	479.5	60	419.5	N/A	N/A	N/A	N/A	NE	NE
NRS018S	1879844.6	699335.2	482.3	57.5	424.8	NE	NE	0	482.3	NE	NE
NRS019H	1880205.1	699497.0	479.3	69	410.3	N/A	N/A	N/A	N/A	NE	NE
NRS020H	1880462.6	699798.1	484.6	67	417.6	N/A	N/A	N/A	N/A	NE	NE
NRS020S	1880459.1	699796.9	487.0	21	466.0	NE	NE	0	487.0	NE	NE
NRS021	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NE	NE
NRS022H	1878809.9	702121.8	481.8	61	420.8	N/A	N/A	N/A	N/A	NE	NE
NRS022S	1878816.3	702127.0	483.5	38	445.5	NE	NE	0	483.5	NE	NE
NRS023H	1879044.9	702438.8	482.6	22.5	460.1	N/A	N/A	N/A	N/A	NE	NE
NRS024H	1879572.6	699460.2	476.6	45	431.6	N/A	N/A	N/A	N/A	NE	NE
NRS025H	1878820.8	701597.5	477.0	70	407.0	N/A	N/A	N/A	N/A	NE	NE
NRS025S	1878820.1	701601.3	476.7	55	421.7	0	476.7	12	464.7	NE	NE
NRS026H	1878697.8	701722.9	477.0	30.5	446.5	N/A	N/A	N/A	N/A	NE	NE
NRS026S	1878699.8	701726.9	476.9	29	447.9	0	476.9	26.8	450.1	NE	NE
NRS027H	1878816.1	701943.1	477.0	30.5	446.5	N/A	N/A	N/A	N/A	NE	NE
NRS028H	1878847.1	701787.2	477.0	18	459.0	N/A	N/A	N/A	N/A	NE	NE
NRS029H	1879089.1	701838.2	476.8	12.5	464.3	N/A	N/A	N/A	N/A	NE	NE
NRS029S	1879086.2	701841.4	473.0	12	461.0	0	473.0	8.7	464.3	NE	NE
NRS030S	1878995.6	701970.0	477.0	31	446.0	0	477.0	7.5	469.5	NE	NE
NRS031H	1879048.8	702281.7	477.4	25	452.4	N/A	N/A	N/A	N/A	NE	NE
NRS032H	1879286.4	701907.6	485.7	12	473.7	N/A	N/A	N/A	N/A	NE	NE
NRS033H	1879622.0	701255.0	505.1	17.5	487.6	N/A	N/A	N/A	N/A	NE	NE
NRS033S	1879622.8	701251.5	506.1	23	483.1	0	506.1	7	499.1	NE	NE
NRS034H	1880039.4	700669.2	498.8	32	466.8	N/A	N/A	N/A	N/A	NE	NE
NRS035H	1880149.9	700517.6	499.9	59	440.9	N/A	N/A	N/A	N/A	NE	NE
NRS035S	1880146.6	700522.2	500.9	59	441.9	4.5	496.4	26.5	474.4	NE	NE

Table 2-3
Boring Data Summary - 2015 and 2020 Field Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Boring ID	Easting	Northing	Ground Surface Elevation	Boring Depth		Top of CCR		Top of Unconsolidated Material		Top of Rock	
			(ft msl)	(ft bgs)	(ft msl)	(ft bgs)	(ft msl)	(ft bgs)	(ft msl)	(ft bgs)	(ft msl)
NRS036H	1880465.2	700235.9	501.2	75	426.2	N/A	N/A	N/A	N/A	NE	NE
NRS036S	1880457.6	700240.8	502.5	74	428.5	2	500.5	35	467.5	NE	NE
NRS037H	1879245.4	702189.1	482.3	8	474.3	N/A	N/A	N/A	N/A	NE	NE
NRS038H	1879533.5	701604.5	498.7	23	475.7	N/A	N/A	N/A	N/A	NE	NE
NRS039H	1880419.6	700456.1	500.8	11	489.8	N/A	N/A	N/A	N/A	NE	NE
NRS040H	1879778.8	700099.1	481.9	46	435.9	N/A	N/A	N/A	N/A	NE	NE
NRS040S	1879774.9	700100.0	480.4	48	432.4	0	480.4	32	448.4	NE	NE
NRS041H	1878875.2	700563.6	473.2	67	406.2	N/A	N/A	N/A	N/A	NE	NE
NRS042H	1878450.2	701365.8	473.8	47	426.8	N/A	N/A	N/A	N/A	NE	NE
NRS043H	1879663.4	700723.2	497.9	55	442.9	N/A	N/A	N/A	N/A	NE	NE
NRS043S	1879658.8	700722.2	498.4	43	455.4	0	498.4	24	474.4	NE	NE
NRS044H	1879381.7	701152.5	494.0	63	431.0	N/A	N/A	N/A	N/A	NE	NE
NRS044S	1879380.6	701158.5	497.0	51.5	445.5	2.3	494.7	9.3	487.7	NE	NE
NRS045H	1879953.6	701023.8	503.0	28	475.0	N/A	N/A	N/A	N/A	NE	NE
NRS046S	1880298.1	700326.8	501.4	76	425.4	3	498.4	27	474.4	NE	NE
NRS047SA	1880403.9	700175.5	501.5	5	496.5	NE	NE	0	501.5	NE	NE
NRS047SC	1880331.8	700188.4	503.8	5	498.8	NE	NE	0	503.8	NE	NE
NRS047SD	1880375.6	700240.9	501.8	5	496.8	NE	NE	0	501.8	NE	NE
NRS048S	1880078.4	699401.9	483.6	71	412.6	5	71.0	6	477.6	NE	NE
NRS049S	1878746.8	700798.0	474.4	57	417.4	NE	NE	0	474.4	NE	NE
NRS050S	1879949.3	700445.3	502.6	64.25	438.32	0	502.6	30	472.6	NE	NE
NRS051	1880360.8	699703.5	484.2	39	445.2	1	483.2	2.7	481.5	NE	NE
NRS051H	1880368.3	699712.0	483.9	29	454.9	N/A	N/A	N/A	N/A	NE	NE
NRS052	1880331.8	699669.5	483.9	65	418.9	1.2	482.7	3.2	480.7	NE	NE
NRS052H	1880322.6	699652.7	482.8	64.8	418.0	N/A	N/A	N/A	N/A	NE	NE
NRS053	1880319.2	699627.8	483.6	72	411.6	2.5	481.1	3.6	480.0	NE	NE
NRS053H	1880316.1	699626.3	479.8	86	393.8	N/A	N/A	N/A	N/A	NE	NE
NRS054	1880300.4	699638.6	483.0	66	417.0	1	482.0	5	478.0	NE	NE
NRS054H	1880296.8	699621.8	483.0	71.2	411.8	N/A	N/A	N/A	N/A	NE	NE
NRS055	1880272.1	699604.2	482.5	70	412.5	1	481.5	3	479.5	NE	NE
NRS055H	1880268.4	699587.7	481.6	70.2	411.4	N/A	N/A	N/A	N/A	NE	NE
NRS056	1880238.5	699564.8	482.1	69	413.1	1	481.1	3	479.1	NE	NE
NRS056H	1880240.6	699562.8	481.7	67.6	414.1	N/A	N/A	N/A	N/A	NE	NE
NRS057	1880771.9	700252.1	500.9	70	430.9	5	495.9	21	479.9	NE	NE
NRS058	1880537.8	700345.2	500.5	63.5	437.0	3	497.5	28	472.5	NE	NE
NRS059	1880672.7	700665.6	505.2	45.5	459.7	NE	NE	0	505.2	NE	NE
NRS060	1880444.7	700468.9	500.9	75	425.9	1	499.9	19.5	481.4	NE	NE
NRS061	1880152.8	700685.1	502.4	42.5	459.9	1.5	500.9	16.7	485.7	NE	NE
NRS062	1880029.1	700886.2	502.9	33	469.9	1.5	501.4	5	497.9	NE	NE
NRS064	1880028.2	700602.5	498.1	48	450.1	1	497.1	23	475.1	NE	NE
NRS065	1880485.3	700626.2	501.9	47.5	454.4	NE	NE	0	501.9	NE	NE
NRS067	1880394.7	699743.1	484.9	35.5	449.4	NE	NE	0	484.9	NE	NE
NRS068	1879350.3	699778.3	476.0	95	381.0	NE	NE	0	476.0	90	386.0
NRS069	1880436.6	700473.7	500.9	70.1	430.8	1	499.9	18.7	482.2	66.4	434.5
NRS070	1880299.8	699604.7	483.1	70	413.1	2.5	480.6	5	478.1	63.5	419.6

Notes:
CCR = coal combustion residuals
DPT = direct-push technology
HPT = hydraulic profiling tool
Borings NRS001 to NRS067 installed via DPT and were terminated at depth of refusal unless otherwise noted
Borings NRS068 to NRS070 were installed via sonic drilling techniques
N/A - information not available
NE = not encountered
Top of CCR may be covered by a layer of fill material and therefore does not begin at ground surface.

Table 2-4
Monitoring Well Construction Details for Existing and New NRS Wells
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Well ID	Easting	Northing	Ground Surface Elevation (ft msl)	Top of Casing (ft msl)	Total Boring Depth (ft bgs)	Depth to Bedrock (ft bgs)	Geologic Unit of Screened Interval	Top of screen (ft bgs)	Bottom of screen (ft bgs)	Screen length (feet)	Bottom of screen (ft msl)	Top of screen (ft msl)
19R	1879355.76	699761.39	476.28	478.90	50	NE	Unconsolidated	39.5	49.5	10	426.78	436.78
20	1878599.35	701044.40	473.04	475.64	53	NE	Unconsolidated	42.0	52.0	10	421.04	431.04
22	1880675.60	699269.38	470.26	472.85	49	49	Unconsolidated	39.0	49.0	10	421.26	431.26
26	1879334.82	699800.30	476.22	479.20	103	93	Lebanon Bedrock (L1)	93.0	103.0	10	373.22	383.22
27	1878606.99	701037.50	473.46	476.76	87	60	Lebanon Bedrock (L1)	77.0	87.0	10	386.46	396.46
GAF-404C	1877923.02	702588.65	463.06	465.70	40	9	Carters Bedrock	28.5	38.5	10	424.56	434.56
GAF-404L	1877913.78	702586.82	461.68	465.78	142	20	Lebanon Bedrock (L2)	120.0	130.0	10	331.68	341.68
GAF-405C	1880731.00	702448.24	482.73	486.46	102	10	Carters Bedrock	19.4	39.4	20	443.33	463.33
GAF-405L	1880736.04	702449.86	482.80	485.90	121	6.1	Lebanon Bedrock (L2)	108.0	118.0	10	364.80	374.80
GAF-438L	1879533.47	701590.78	499.14	501.61	140	24	Lebanon Bedrock (L1)	119.0	129.0	10	370.14	380.14
GAF-439A	1879341.93	700756.97	472.15	474.94	20.5	NE	CCR	10.0	20.0	10	452.15	462.15
GAF-439U	1879347.82	700761.86	472.10	475.10	34.5	NE	Unconsolidated	29.5	34.5	5	437.60	442.60
GAF-440AR	1879910.39	700787.52	500.96	503.53	21	NE	CCR	10.0	20.0	10	480.96	490.96
GAF-440U	1879914.56	700779.57	501.11	503.65	53	NE	Unconsolidated	41.0	51.0	10	450.11	460.11
GAF-441L	1880449.04	700480.14	501.06	504.08	135	72	Lebanon Bedrock (L1)	84.0	99.0	15	402.06	417.06
GAF-441U	1880444.46	700477.63	501.01	503.77	55	NE	Unconsolidated	40.0	50.0	10	451.01	461.01
GAF-442A	1880223.47	700164.18	507.49	510.42	28	NE	CCR	15.0	25.0	10	482.49	492.49
GAF-442U	1880217.25	700156.55	507.69	510.69	69.5	NE	Unconsolidated	59.0	69.0	10	438.69	448.69
GAF-444U	1880314.06	699619.43	483.00	486.01	71.5	NE	Unconsolidated	50.0	60.0	10	423.00	433.00
GAF-445L	1880648.76	699261.83	469.49	472.30	115	50	Lebanon Bedrock (L1)	74.0	94.0	20	375.49	395.49
GAF-447U	1878620.66	701986.18	452.39	455.78	14.2	NE	Unconsolidated	8.6	13.6	5	438.79	443.79
GAF-448L	1878836.51	700674.57	473.32	476.13	160	59	Lebanon Bedrock (L1)	86.0	96.0	10	377.32	387.32
GAF-448U	1878834.79	700678.95	473.18	475.97	50	NE	Unconsolidated	35.0	50.0	15	423.18	438.18
GAF-450C	1878185.59	702528.72	463.67	466.73	122	44	Carters Bedrock	48.5	53.5	5	410.17	415.17
GAF-450L	1878175.15	702526.37	463.60	466.62	120	60	Lebanon Bedrock (L1)	75.0	95.0	20	368.60	388.60
GAF-451C	1879587.39	702407.28	489.76	485.62	64	15	Carters Bedrock	52.6	63.1	10.5	426.66	437.16
GAF-451CR	1879518.52	702485.62	479.40	482.19	80	2	Carters Bedrock (Lower)	43.6	53.6	10	425.80	435.80
GAF-489A	1879558.88	699759.52	472.36	475.45	15.5	NE	CCR	5.0	15.0	10	457.36	467.36
GAF-489U	1879566.45	699746.79	472.94	475.26	54.5	NE	Unconsolidated	44.0	54.0	10	418.94	428.94
GAF-526L	1879370.32	699740.41	476.38	479.34	210	76	Lebanon Bedrock	152.0	162.0	10	314.38	324.38
GAF-526U	1879350.33	699778.34	476.03	478.88	95	90	Unconsolidated	63	68	5	408.03	413.03
GAF-541U	1880436.60	700473.74	500.85	503.44	70.1	66.4	Unconsolidated	58	63	5	437.85	442.85
GP-1	1878836.40	701560.06	476.96	480.79	20	NE	CCR	6.1	11.1	5	465.91	470.91
GP-2	1879507.78	701039.77	495.70	499.32	32	NE	CCR	22.0	27.0	5	468.70	473.70
GP-3	1878795.80	701073.27	468.06	471.53	22	NE	CCR	12.9	17.9	5	450.13	455.13
GP-4	1879303.07	700269.22	470.86	475.03	28	NE	CCR	23.4	28.4	5	442.46	447.46
GP-5	1880018.98	700459.35	502.86	505.43	32	NE	CCR	22.0	27.0	5	475.86	480.86
GP-6	1879801.57	699631.94	482.00	485.97	28	NE	CCR	18.5	23.5	5	458.50	463.50
S3	1879339.47	699791.33	476.03	480.04	60	NE	Unconsolidated	48.7	58.7	10	417.33	427.33

Notes:
CCR = coal combustion residuals
ft msl = feet above mean sea level
ft bgs = feet below ground surface
NE = not encountered
Brown shading indicates the two new wells installed in the 2020 field investigation.

Table 2-5
Soil Sample Analytes – 2020 NRS Field Investigation
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

LABORATORY ANALYTES

Target Metals

- Beryllium
- Cadmium
- Lithium
- Nickel

Other Laboratory Analytes

- Aluminum
- Antimony
- Arsenic
- Barium
- Boron
- Calcium
- Chromium
- Cobalt
- Copper
- Iron
- Lead
- Magnesium
- Manganese
- Mercury
- Molybdenum
- Phosphorous
- Potassium
- Selenium
- Silver
- Sodium
- Sulfur
- Thallium
- Vanadium
- Zinc
- Total Inorganic Carbon
- Total Organic Carbon
- Acid-Base Accounting (sulfur, sulfate, pyritic sulfur, residual sulfur, acid neutralization potential, net acid neutralization potential, and pH)

FIELD ANALYSES

- Paste pH

SPECIAL ANALYSES FOR TREATABILITY TEST BULK SOIL

- Sequential Extraction (beryllium, cadmium, lithium, nickel, and iron)
- X-Ray Diffraction

Notes:
(1) Analytes listed above are from Table 3-2 of the Work Plan (AECOM, 2019).
(2) Analytical methods are identified in the Quality Assurance Framework Addendum, Appendix A of the Work Plan (AECOM, 2019).
(3) Sample collection and field analysis methods are specified in the Sampling and Analysis Plan, Appendix B of the Work Plan (AECOM, 2019).

Table 2-6
In Situ Groundwater Sample Summary - 2015 and 2020 NRS Field Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Boring	Easting	Northing	Ground Surface (ft msl)	Sample Depth (ft bgs)		Sample Depth ft msl		Sample Type	Notes
				Top	Bottom	Bottom	Top		
2015 Field Investigation Samples									
NRS001W	1879434.37	699633.22	476.8	53	57	419.8	423.8	pH	
NRS002W	1879282.54	699886.82	476.3	45	49	427.3	431.3	pH	
NRS003A	1879440.34	699821.32	473.0	18.7	22.7	450.3	454.3	pH	
NRS003B	1879440.34	699821.32	473.0	36	40	433.0	437.0	No - dry	
NRS003W	1879446.41	699817.71	473.0	39	43	430.0	434.0	pH	
NRS004A	1879407.53	699787.95	472.0	20.7	24.7	447.3	451.3	pH	
NRS004B	1879408.44	699785.19	472.0	30.8	34.8	437.2	441.2	pH	
NRS005A	1879437.72	699730.51	471.5	14.2	18.2	453.3	457.3	pH	
NRS005B	1879440.51	699730.32	471.5	31.3	35.3	436.2	440.2	pH	
NRS005C	1879443.56	699729.82	471.5	38.7	42.7	428.8	432.8	No - dry	
NRS006A	1879374.78	699825.32	473.0	10.8	14.8	458.2	462.2	pH	
NRS006B	1879375.20	699822.84	473.0	32	36	437.0	441.0	No - dry	
NRS007A	1879363.79	699753.66	477.3	45	49	428.3	432.3	pH	
	1879363.79	699753.66		39	49	428.3	438.3	pH	
NRS009A	1880519.84	700760.42	506.6	11.5	16.5	490.1	495.1	pH	
NRS009B	1880519.84	700760.42	506.6	3	8	498.6	503.6	No - dry	
NRS012A	1879529.49	699847.70	473.0	10.7	14.7	458.3	462.3	pH	
NRS012B	1879529.49	699847.70	473.0	20	24	449.0	453.0	pH	
NRS015W	1879142.18	700121.89	474.3	45	49	425.3	429.3	pH	
NRS018W	1879847.73	699336.38	482.3	31	35	447.3	451.3	pH	
NRS020W	1880459.41	699797.30	487.0	28	32	455.0	459.0	pH	
NRS022W	1878812.17	702123.92	483.5	48	52	431.5	435.5	pH	
NRS035W	1880144.16	700525.19	500.9	10	14	486.9	490.9	pH	
	1880144.16	700525.19		24	28	472.9	476.9	pH	
NRS036WA	1880461.43	700238.19	502.5	15	19	483.5	487.5	pH	
NRS040W	1879774.79	700098.87	480.4	13	17	463.4	467.4	pH	
NRS042W	1878450.40	701358.75	472.1	44	48	424.1	428.1	pH	
NRS044W	1879381.39	701155.23	497.0	24	28	469.0	473.0	pH	
2020 Field Investigation Samples									
NRS051	1880360.80	699703.45	484.2	35	39	445.2	449.2	No - dry	Dry overnight
NRS052	1880331.82	699669.46	483.9	35	39	444.9	448.9	Field+Target	
	1880331.82	699669.46	483.9	61	65	418.9	422.9	No - dry	Dry after 1.5 hours
NRS053	1880319.21	699627.77	483.6	68	72	411.6	415.6	Field+Target	
NRS054	1880300.40	699638.58	483.0	30	34	449.0	453.0	No - dry	Dry after 1 hour
	1880300.40	699638.58		62	66	417.0	421.0	Field+Target	
NRS055	1880272.10	699604.21	482.5	30	34	448.5	452.5	No - dry	Dry after 1 hour
	1880272.10	699604.21		45	49	433.5	437.5	No - dry	Dry after 1 hour
	1880272.10	699604.21		66	70	412.5	416.5	Field+Target	
NRS056	1880238.54	699564.85	482.1	30	34	448.1	452.1	No - dry	Dry after 1 hour
	1880238.54	699564.85		45	49	433.1	437.1	No - dry	Dry after 1 hour
	1880238.54	699564.85		65	69	413.1	417.1	Field+Target	
NRS057	1880771.91	700252.12	500.9	16	20	480.9	484.9	Field+Target	
NRS058	1880537.81	700345.23	500.5	16	20	480.5	484.5	Field+Target	
	1880537.81	700345.23		59	63	437.5	441.5	Field	
NRS059	1880672.73	700665.60	505.2	41	45	460.2	464.2	Field+Target	
NRS060	1880444.69	700468.90	500.9	16	20	480.9	484.9	Field+Target	
	1880444.69	700468.90		71	75	425.9	429.9	Field+Target	Insufficient water to sample after 1 hour, sampled after weekend
NRS061	1880152.77	700685.05	502.4	14	18	484.4	488.4	Field+Target	
	1880152.77	700685.05		38	42	460.4	464.4	Field+Target	
NRS062	1880029.10	700886.15	502.9	29	33	469.9	473.9	Field+Target	
NRS064	1880028.19	700602.46	498.1	11	15	483.1	487.1	Field+Target	
	1880028.19	700602.46		44	48	450.1	454.1	Field	
NRS065	1880485.35	700626.22	501.9	43	47	454.9	458.9	Field+Target	
NRS067	1880394.73	699743.15	484.9						Boring refusal at water table

Notes:
Field = field parameters collected (pH, conductivity, dissolved oxygen, and temperature)
Target = target metals analyzed for total and / or dissolved fractions
The target metals are beryllium, cadmium, lithium, and nickel
NRS001 to NRS044 were sampled in 2015
NRS051 to NRS067 were sampled in January and February 2020 as part of the Treatability Study Field Investigation
The ground surface elevation are based on the associated soil boring log, with the following exceptions:
At borings NRS003A, NRS003B, NRS003W, NRS015W and NRS042W, ground surface is estimated from 2017 LIDAR data
NRS003A and NRS003B coordinates are based on boring NRS003H in the Site database
NRS007A and NRS007B coordinates are based on boring NRS007H in the Site database
NRS009A and NRS009B coordinates are based on boring NRS009 coordinates on the boring log

Table 2-7
Groundwater Sample Analytes – 2020 NRS Field Investigation
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

LABORATORY ANALYTES

Target Metals
- Beryllium
- Cadmium
- Lithium
- Nickel

Appendix III Parameters
- Calcium
- Boron
- Chloride
- Fluoride
- pH (field)
- Sulfate
- Total Dissolved Solids

Appendix IV Parameters
- Antimony
- Arsenic
- Barium
- Chromium
- Cobalt
- Lead
- Mercury
- Molybdenum
- Selenium
- Thallium
- Radium 226 and 228

Tennessee-Specific Parameters
- Copper
- Silver
- Vanadium
- Zinc

Other Laboratory Parameters
- Acidity, Total
- Alkalinity, Total as $CaCO_3$
- Alkalinity, Hydroxide as $CaCO_3$
- Alkalinity, Bicarbonate as $CaCO_3$
- Alkalinity, Carbonate as $CaCO_3$
- Aluminum
- Iron
- Manganese
- Nitrate-Nitrite
- Total Kjeldahl Nitrogen
- Magnesium
- Phosphate
- Potassium
- Sodium
- Sulfide
- Total Organic Carbon
- Total Suspended Solids

FIELD PARAMETERS
- pH
- Dissolved Oxygen
- Temperature
- Turbidity
- Oxidation Reduction Potential
- Specific Conductance
- Aerated pH
- Dissolved Carbon Dioxide
- Ferrous Iron [Fe(II)]
- Sulfide

Notes:
(1) Analytes listed above are from Table 3-1 of the Work Plan (AECOM, 2019).
(2) Analytical methods are identified in the Quality Assurance Framework Addendum, Appendix A of the Work Plan (AECOM, 2019).
(3) Sample collection and field analysis methods are specified in the Sampling and Analysis Plan, Appendix B of the Work Plan (AECOM, 2019).

Table 3-1
Groundwater and CCR Porewater Elevations, January through October 2020
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Well Location	Easting	Northing	Ground Surface Elevation (feet msl)	Top of Casing (feet msl)	Unit of Screened Interval	Screened Interval (feet bgs)		Screen Length (ft)	January 13, 2020		February 11, 2020		March 16, 2020		April 13, 2020		May 11, 2020	
						Top	Bottom		Water Elevation (feet msl)	Depth to Water (feet bgs)	Water Elevation (feet msl)	Depth to Water (feet bgs)	Water Elevation (feet msl)	Depth to Water (feet bgs)	Water Elevation (feet msl)	Depth to Water (feet bgs)	Water Elevation (feet msl)	Depth to Water (feet bgs)
19R	1879355.76	699761.39	476.28	478.90	Unconsolidated	39.5	49.5	10	453.25	23.03	453.78	22.50	453.06	23.22	454.46	21.82	452.52	23.76
20	1878599.35	701044.4	473.04	475.64	Unconsolidated	42	52	10	452.02	21.02	451.84	21.20	451.16	21.88	452.24	20.80	450.88	22.16
22	1880675.6	699269.38	470.26	472.85	Unconsolidated	39	49	10	447.10	23.16	447.53	22.73	446.62	23.64	447.49	22.77	446.76	23.50
26	1879334.82	699800.3	476.22	479.20	Lebanon Bedrock (L1)	93	103	10	461.22	15.00	462.46	13.76	461.38	14.84	462.92	13.30	460.72	15.50
27	1878606.99	701037.5	473.46	476.76	Lebanon Bedrock (L1)	77	87	10	458.36	15.10	458.47	14.99	457.87	15.59	458.41	15.05	457.98	15.48
GAF-404C	1877923.02	702588.65	463.06	465.70	Carters Bedrock	28.5	38.5	10	449.56	13.50	449.39	13.67	447.84	15.22	448.37	14.69	447.53	15.53
GAF-404L	1877913.78	702586.82	461.68	465.78	Lebanon Bedrock (L2)	120	130	10	450.96	10.72	450.12	11.56	449.51	12.17	450.75	10.93	449.37	12.31
GAF-405C	1880731	702448.24	482.73	486.46	Carters Bedrock	19.4	39.4	20	482.81	-0.08	483.12	-0.39	480.28	2.45	483.08	-0.35	480.53	2.20
GAF-405L	1880736.04	702449.86	482.80	485.90	Lebanon Bedrock (L2)	108	118	10	476.55	6.25	477.68	5.12	475.25	7.55	480.21	2.59	475.30	7.50
GAF-438L	1879533.47	701590.78	499.14	501.61	Lebanon Bedrock (L1)	119	129	10	484.01	15.13	484.90	14.24	483.31	15.83	484.41	14.73	483.42	15.72
GAF-439A	1879341.93	700756.97	472.15	474.94	CCR	10	20	10	472.09	0.06	472.12	0.03	471.00	1.15	472.08	0.07	470.66	1.49
GAF-439U	1879347.82	700761.86	472.10	475.10	Unconsolidated	29.5	34.5	5	471.70	0.40	472.94	-0.84	471.88	0.22	472.94	-0.84	471.48	0.62
GAF-440AR	1879910.39	700787.52	500.96	503.53	CCR	10	20	10	490.10	10.86	490.69	10.27	491.07	9.89	491.35	9.61	490.67	10.29
GAF-440U	1879914.56	700779.57	501.11	503.65	Unconsolidated	41	51	10	491.14	9.97	492.31	8.80	492.45	8.66	492.79	8.32	492.13	8.98
GAF-441L	1880449.04	700480.14	501.06	504.08	Lebanon Bedrock (L1)	84	99	15	488.64	12.42	489.17	11.89	489.38	11.68	490.04	11.02	489.64	11.42
GAF-441U	1880444.46	700477.63	501.01	503.77	Unconsolidated	40	50	10	489.15	11.86	489.94	11.07	490.17	10.84	490.59	10.42	490.27	10.74
GAF-442A	1880223.47	700164.18	507.49	510.42	CCR	15	25	10	486.51	20.98	486.94	20.55	487.10	20.39	487.21	20.28	486.90	20.59
GAF-442U	1880217.25	700156.55	507.69	510.69	Unconsolidated	59	69	10	467.18	40.51	468.21	39.48	467.87	39.82	469.99	37.70	469.49	38.20
GAF-444U	1880314.06	699619.43	483.00	486.01	Unconsolidated	50	60	10	449.92	33.08	450.32	32.68	449.65	33.35	451.13	31.87	449.90	33.10
GAF-445L	1880648.76	699261.83	469.49	472.30	Lebanon Bedrock (L1)	74	94	20	446.68	22.81	448.60	20.89	445.44	24.05	448.67	20.82	445.42	24.07
GAF-447U	1878620.66	701986.18	452.39	455.78	Unconsolidated	8.6	13.6	5	452.66	-0.27	453.40	-1.01	450.70	1.69	453.08	-0.69	450.33	2.06
GAF-448L	1878836.51	700674.57	473.32	476.13	Lebanon Bedrock (L1)	86	96	10	461.98	11.34	462.42	10.90	461.95	11.37	462.38	10.94	461.75	11.57
GAF-448U	1878834.79	700678.95	473.18	475.97	Unconsolidated	35	50	15	462.12	11.06	463.36	9.82	463.42	9.76	463.89	9.29	463.25	9.93
GAF-450C	1878185.59	702528.72	463.67	466.73	Carters Bedrock	48.5	53.5	5	448.90	14.77	448.90	14.77	447.42	16.25	448.48	15.19	447.02	16.65
GAF-450L	1878175.15	702526.37	463.60	466.62	Lebanon Bedrock (L1)	75	95	20	452.43	11.17	452.22	11.38	451.13	12.47	452.29	11.31	450.81	12.79
GAF-451C	1879587.39	702407.28	489.76	485.62	Carters Bedrock	52.6	63.1	10.5	476.93	12.83	476.70	13.06	476.71	13.05	477.57	12.19	475.90	13.86
GAF-451CR	1879518.52	702485.62	479.40	482.19	Carters Bedrock (Lower)	43.6	53.6	10	475.99	3.41	476.65	2.75	475.08	4.32	476.41	2.99	475.87	3.53
GAF-489A	1879558.88	699759.52	472.36	475.45	CCR	5	15	10	465.95	6.41	468.83	3.53	468.05	4.31	470.19	2.17	466.64	5.72
GAF-489U	1879566.45	699746.79	472.94	475.26	Unconsolidated	44	54	10	463.16	9.78	465.53	7.41	465.31	7.63	466.15	6.79	464.41	8.53
GAF-526L	1879370.32	699740.41	476.38	479.34	Lebanon Bedrock	152	162	10	446.17	30.21	446.69	29.69	443.78	32.60	446.73	29.65	444.46	31.92
GAF-526U	1879350.33	699778.34	476.03	478.88	Unconsolidated	63	68	5	NI	NI	NI	NI	NI	NI	NI	NI	459.66	16.37
GAF-541U	1880436.6	700473.74	500.85	503.44	Unconsolidated	58	63	5	NI	NI	NI	NI	NI	NI	NI	NI	490.17	10.68
GP-1	1878836.4	701560.06	476.96	480.79	CCR	6.1	11.1	5	477.28	-0.32	477.29	-0.33	475.80	1.16	476.47	0.49	474.87	2.09
GP-2	1879507.78	701039.77	495.70	499.32	CCR	22.0	27.0	5	472.71	22.99	472.60	23.10	472.71	22.99	473.44	22.26	487.11	8.59
GP-3	1878795.8	701073.27	468.06	471.53	CCR	12.9	17.9	5	468.31	-0.25	NG	NG	NG	NG	468.05	0.01	467.61	0.45
GP-4	1879303.07	700269.22	470.86	475.03	CCR	23.4	28.4	5	469.62	1.24	NG	NG	469.51	1.35	472.14	-1.28	468.35	2.51
GP-5	1880018.98	700459.35	502.86	505.43	CCR	22.0	27.0	5	491.08	11.78	491.11	11.75	493.57	9.29	494.54	8.32	489.87	12.99
GP-6	1879801.57	699631.94	482.00	485.97	CCR	18.5	23.5	5	464.72	17.28	466.20	15.80	470.75	11.25	468.76	13.24	471.76	10.24
S3	1879339.47	699791.33	476.03	480.04	Unconsolidated	48.7	58.7	10	455.39	20.64	456.11	19.92	455.36	20.67	456.82	19.21	454.81	21.22

Notes:
Surface elevation is from the time of installation and may not reflect current surface elevation.
Depth to water in feet bgs is calculated using the surveyed ground surface elevation at the time of well installation.
Ground surface elevation is the surveyed point at the time of well installation and may not reflect the current ground surface.
CCR = coal combustion residuals
feet msl = feet mean sea level
feet bgs = feet below ground surface
feet bTOC = feet below top of casing
NI = not installed at the time of gauging
NG = not gauged
Negative values indicate the gauged depth to water was above ground surface and in the above-ground portion of the well riser.

Table 3-2
Summary of Hydraulic Conductivity in the NRS Area
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Well or Borehole ID	Test Type	Ground Surface Elevation (ft msl)	Tested Interval Depth (ft bgs)		Tested Interval Elevation (ft msl)		K (ft/min)	K (cm/s)	Geologic Formation Tested	Source
			Upper	Lower	Upper	Lower				
19R	Pumping	476.28	39.5	49.5	437	427	9.1E-05	4.6E-05	Unconsolidated	2020 FIR
S3	Pumping	476.03	48	58	428	418	1.9E-04	9.5E-05	Unconsolidated	2020 FIR
22	Slug	470.26	39	49	431	421	3.7E-06	1.9E-06	Unconsolidated	AECOM, 2021
GAF-439A	Slug	472.17	10	20	462	452	5.9E-02	3.0E-02	CCR Material	AECOM, 2021
GP-1	Slug	476.96	6.1	11.1	471	466	7.5E-04	3.8E-04	CCR Material	Arcadis, 2014
GP-2	Slug	495.70	22	27	474	469	1.4E-04	7.3E-05	CCR Material	Arcadis, 2014
GP-3	Slug	468.06	12.9	17.9	455	450	3.9E-04	2.0E-04	CCR Material	Arcadis, 2014
GP-4	Slug	470.86	23.4	28.4	447	442	1.5E-03	7.4E-04	CCR Material	Arcadis, 2014
GP-6	Slug	482.00	18.5	23.5	464	459	1.3E-04	6.7E-05	CCR Material	Arcadis, 2014
GAF-441L	Slug	501.06	84	99	417	402	4.3E-06	2.2E-06	Lebanon (L1)	AECOM, 2021
GAF-440U	Slug	501.11	41	51	450	460	1.9E-04	9.6E-05	Unconsolidated	2020 FIR
GAF-441U	Slug	501.01	40	50	461	451	5.7E-06	2.9E-06	Unconsolidated	AECOM, 2021
GAF-442U	Slug	507.69	59	69	449	439	1.0E-05	5.3E-06	Unconsolidated	2020 FIR
GAF-444U	Slug	483.03	50	60	433	423	8.7E-06	4.4E-06	Unconsolidated	2020 FIR
GAF-489U	Slug	472.94	44	54	429	419	4.7E-06	2.4E-06	Unconsolidated	2020 FIR
GAF-448U	Slug	473.18	35	50	438	423	2.5E-06	1.3E-06	Unconsolidated	AECOM, 2021
GAF-526U	Slug	476.03	63	68	413	408	1.4E-04	7.3E-05	Unconsolidated	2020 FIR
GAF-541U	Slug	500.85	58	63	443	438	1.8E-06	9.2E-07	Unconsolidated	2020 FIR

Notes:
2020 FIR is this Field Investigation Report
TVA and Arcadis (2014) presents slug test data for GP-1, GP-2, GP-3, GP-4, and GP-6 from field testing by TVA (2011) that is unpublished.
Elevations are reported relative to NGVD29 (National Geodetic Vertical Datum of 1929)
bgs = below ground surface
CCR = coal combustion residuals
cm/s = centimeters per second
ft = feet
ft/min = feet per minute
ft msl = feet mean sea level
K = hydraulic conductivity

Table 4-1
Well Groundwater Analytical Results, January to October 2020
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

					Parameter	pH, Field	aerated pH	Dissolved Oxygen	ORP	Specific Conductance, Field	Temperature	Turbidity, field	Sulfide	Iron, Ferrous	Carbon Dioxide	Acidity		Alkalinity, Carbonate	
					Unit	pH units	pH units	mg/L	mV	umhos/cm	deg c	NTU	mg/L	mg/L	mg/L	mg/L		mg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Validator Qualifier	Result	Validator Qualifier
19R	GAF-GW-19R-01152020	39.5-49.5	1/15/2020	N	D														
19R	GAF-GW-19R-01152020		1/15/2020	N	T	3.54	3.58	0.15	235.4	2326	16.1	17.1		7.0	100.0	1060		< 5.00	U
19R	GAF-GW-19R-03182020		3/18/2020	N	T	3.44	3.45	0.10	312.9	2679	15.5	55.2	0	6.5	30				
19R	GAF-GW-19R-04222020		4/22/2020	N	D														
19R	GAF-GW-19R-04222020		4/22/2020	N	T	3.49	3.47	0.26	257.2	2970	15.8	12.5	10.0	7.5	> 100	1280		< 5.00	U
19R	GAF-GW-19R-06162020		6/16/2020	N	T	3.77		0.23	124.9	3259	16.2	3.98	0	3.6	>100	1070		< 5.00	U
19R	GAF-GW-19R-07142020		7/14/2020	N	D														
19R	GAF-GW-19R-07142020		7/14/2020	N	T	4.12		1.10	231.0	3244	16.9	5.82						< 5.00	U
19R	GAF-GW-19R-08172020		8/17/2020	N	D														
19R	GAF-GW-19R-08172020		8/17/2020	N	T	3.58	3.62	1.32	255.0	3164	17.5	29.2	0	5.5	>100	1120		< 5.00	U
19R	GAF-GW-19R-08182020		8/18/2020	N	T	5.21		0.31	262.9	3139	16.5	19.3							
19R	GAF-GW-19R-10212020		10/21/2020	N	D														
19R	GAF-GW-19R-10212020		10/21/2020	N	T	3.59	3.59	5.97	238.6	3199	16.3	4.06	0	7.0	50	1050		< 5.00	U
20	GAF-GW-20-01162020	42-52	1/16/2020	N	D														
20	GAF-GW-20-01162020		1/16/2020	N	T	6.19	6.35	0.45	22.8	1208	15.3	3.32		4.5	25	-19.7		< 5.00	U
20	GAF-GW-20-04222020		4/22/2020	N	D														
20	GAF-GW-20-04222020		4/22/2020	N	T	6.04	5.84	0.43	6.7	1800	16.1	1.20	10	5.5	30	7.83		< 5.00	U
20	GAF-GW-903C-04222020		4/22/2020	FD	D														
20	GAF-GW-903C-04222020		4/22/2020	FD	T											< 5.00	U	< 5.00	U
20	GAF-GW-20-06172020		6/17/2020	N	D														
20	GAF-GW-20-06172020		6/17/2020	N	T	6.23		0.48	50.5	1746	19.4	2.54	0	1.8	>100	8.37		< 5.00	U
20	GAF-GW-20-07152020		7/15/2020	N	T	6.91		0.24	-33.1	1742	19.8	2.50						< 5.00	U
20	GAF-GW-903B-08172020		8/17/2020	FD	D														
20	GAF-GW-903B-08172020		8/17/2020	FD	T											< 5.00	UJ	< 5.00	U
20	GAF-GW-20-08172020		8/17/2020	N	D														
20	GAF-GW-20-08172020		8/17/2020	N	T	6.20	6.15	0.32	86.4	1711	18.6	1.92	0	2.2	>100	-49.4	J	< 5.00	U
20	GAF-GW-903A-10212020		10/21/2020	FD	D														
20	GAF-GW-903A-10212020		10/21/2020	FD	T											-46.9		< 5.00	U
20	GAF-GW-20-10212020		10/21/2020	N	D														
20	GAF-GW-20-10212020		10/21/2020	N	T	6.22	6.22	0.36	13.3	1628	17.0	19.60	0	6	>100	-52.8		< 5.00	U
22	GAF-GW-22-01162020	39-49	1/16/2020	N	D														
22	GAF-GW-22-01162020		1/16/2020	N	T	7.38	7.46	1.43	81.5	312.4	17.9	4.96		0	12.5	-64.1		< 5.00	U
22	GAF-GW-22-04232020		4/23/2020	N	D														
22	GAF-GW-22-04232020		4/23/2020	N	T	7.08	7.12	1.88	74.8	538	17.2	0.80	2.5	4	11	-221		< 5.00	U
22	GAF-GW-22-06162020		6/16/2020	N	D														
22	GAF-GW-22-06162020		6/16/2020	N	T	7.38		1.71	166.1	411.1	18.9	2.49	0	0	90	-97.4		< 5.00	U
22	GAF-GW-22-07152020		7/15/2020	N	T	7.73		1.98	58.4	424.1	21.1	2.10						< 5.00	U
22	GAF-GW-22-08182020		8/18/2020	N	D														
22	GAF-GW-22-08182020		8/18/2020	N	T	7.07	7.1	2.16	204.4	421.9	19.1	0.68	0	0	35	-128		< 5.00	U
22	GAF-GW-22-10212020		10/21/2020	N	D														
22	GAF-GW-22-10212020		10/21/2020	N	T	7.02	7.02	7.61	176.6	433.8	20.2	3.48	0	0	40	-205		< 5.00	U

Table 4-1
Well Groundwater Analytical Results, January to October 2020
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

						Parameter	Alkalinity, Hydroxide as		Alkalinity, Total as CaCO3		Alkalinity,Bicarbonate (CaCO3)		Aluminum		Antimony		Arsenic		Barium		Beryllium		Boron	
						Unit	mg/L		mg/L		mg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved		Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
19R	GAF-GW-19R-01152020	39.5-49.5	1/15/2020	N	D								68700		< 0.378	U	< 1.86	U*	15.0		13.3		3880	
19R	GAF-GW-19R-01152020		1/15/2020	N	T		< 5.00	U	< 5.00	U	< 5.00	U	69000		< 0.378	U	2.06		16.1		13.3		3950	
19R	GAF-GW-19R-03182020		3/18/2020	N	T																			
19R	GAF-GW-19R-04222020		4/22/2020	N	D								57800		0.511	J	3.11		13.9		12.6		3750	J
19R	GAF-GW-19R-04222020		4/22/2020	N	T		< 5.00	U	< 5.00	U	< 5.00	U	65800		0.472	J	2.41		14.5		12.5		3610	J
19R	GAF-GW-19R-06162020		6/16/2020	N	T		< 5.00	U	< 5.00	U	< 5.00	U	55300		< 0.378	U	2.56		15.0		12.5		3390	J
19R	GAF-GW-19R-07142020		7/14/2020	N	D										< 0.756	U	2.84		13.6	J	13.5		3310	J
19R	GAF-GW-19R-07142020		7/14/2020	N	T				< 5.00	U	< 5.00	U			< 0.756	U	2.61		16.7	J	14.0		3440	J
19R	GAF-GW-19R-08172020		8/17/2020	N	D								59700		< 0.378	U	2.23		11.7	J	11.2		2980	J
19R	GAF-GW-19R-08172020		8/17/2020	N	T		< 5.00	U	< 5.00	U	< 5.00	U	60700		< 0.378	U	2.23		11.9		10.7		3390	J
19R	GAF-GW-19R-08182020		8/18/2020	N	T																			
19R	GAF-GW-19R-10212020		10/21/2020	N	D								57600		< 0.378	U	3.44		14.4	J	12.4		3490	J
19R	GAF-GW-19R-10212020		10/21/2020	N	T		< 5.00	U	< 5.00	U	< 5.00	U	56700		< 0.378	U	3.32		13.9	J	12.5		3320	J
20	GAF-GW-20-01162020	42-52	1/16/2020	N	D								< 12.5	U	< 0.378	U	0.569	J	20.9		< 0.182	U	5080	
20	GAF-GW-20-01162020		1/16/2020	N	T		< 5.00	U	92.6		92.6		25.2	J	< 0.378	U	< 0.746	U*	22.3		< 0.258	U*	5060	
20	GAF-GW-20-04222020		4/22/2020	N	D								27.7	J	< 0.378	U	0.747	J	22.1		< 0.182	U	5980	J
20	GAF-GW-20-04222020		4/22/2020	N	T		< 5.00	U	46.5	J	46.5	J	48.8		< 0.378	U	0.736	J	22.3		< 0.182	U	5880	J
20	GAF-GW-903C-04222020		4/22/2020	FD	D								30.5		< 0.378	U	0.879	J	22.5		< 0.182	U	5870	J
20	GAF-GW-903C-04222020		4/22/2020	FD	T		< 5.00	U	73.9	J	73.9	J	39.7		< 0.378	U	0.797	J	22.1		< 0.182	U	5690	J
20	GAF-GW-20-06172020		6/17/2020	N	D								< 14.8	U*	< 0.378	U	0.710	J	23.5		< 0.182	U	5020	
20	GAF-GW-20-06172020		6/17/2020	N	T		< 5.00	U	100		100		28.5	J	< 0.378	U	0.644	J	22.3		< 0.182	U	4760	
20	GAF-GW-20-07152020		7/15/2020	N	T				89.5		89.5				< 0.378	U	0.637	J	21.4		< 0.182	U	4440	J
20	GAF-GW-903B-08172020		8/17/2020	FD	D								< 12.5	U	< 0.378	U	0.453	J	23.1		< 0.182	U	5270	J
20	GAF-GW-903B-08172020		8/17/2020	FD	T		< 5.00	U	99.0		99.0		< 18.8	U*	< 0.378	U	0.566	J	25.1		< 0.182	U	5460	J
20	GAF-GW-20-08172020		8/17/2020	N	D								< 12.5	U	< 0.378	U	0.461	J	23.5		< 0.182	U	5490	J
20	GAF-GW-20-08172020		8/17/2020	N	T		< 5.00	U	101		101		< 15.9	U*	< 0.378	U	0.581	J	23.5		< 0.182	U	5440	J
20	GAF-GW-903A-10212020		10/21/2020	FD	D								21.8	J	< 0.378	U	0.455	J	21.4		< 0.182	U	5400	J
20	GAF-GW-903A-10212020		10/21/2020	FD	T		< 5.00	U	108		108		17.2	J	< 0.378	U	0.662	J	22.7		< 0.182	U	5450	J
20	GAF-GW-20-10212020		10/21/2020	N	D								21.4	J	< 0.378	U	0.697	J	21.5		< 0.182	U	5170	J
20	GAF-GW-20-10212020		10/21/2020	N	T		< 5.00	U	110		110		19.1	J	< 0.378	U	0.733	J	22.1		< 0.182	U	5030	J
22	GAF-GW-22-01162020	39-49	1/16/2020	N	D								< 12.5	U	< 0.378	U	< 0.313	U	16.8		< 0.182	U	< 38.6	U
22	GAF-GW-22-01162020		1/16/2020	N	T		< 5.00	U	197		197		< 12.5	U	< 0.378	U	< 0.313	U	17.1		< 0.182	U	< 38.6	U
22	GAF-GW-22-04232020		4/23/2020	N	D								< 12.5	U	0.881	J	< 0.313	U	15.8		< 0.182	U	53.0	J
22	GAF-GW-22-04232020		4/23/2020	N	T		< 5.00	U	183		183		< 12.5	U	< 1.02	U*	< 0.313	U	15.9		< 0.182	U	< 54.2	U*
22	GAF-GW-22-06162020		6/16/2020	N	D								< 12.5	U	0.404	J	< 0.313	U	< 16.0	U*	< 0.182	U	89.6	
22	GAF-GW-22-06162020		6/16/2020	N	T		< 5.00	U	189		189		13.4		0.463	J	< 0.313	U	15.8		< 0.182	U	< 65.0	U*
22	GAF-GW-22-07152020		7/15/2020	N	T				188		188				< 0.378	U	< 0.313	U	16.1		< 0.182	U	< 38.6	UJ
22	GAF-GW-22-08182020		8/18/2020	N	D								< 12.5	U	< 0.378	U	< 0.313	U	18.0		< 0.182	U	43.6	J
22	GAF-GW-22-08182020		8/18/2020	N	T		< 5.00	U	187		187		< 12.5	U	< 0.378	U	< 0.313	U	17.3		< 0.182	U	< 38.6	U
22	GAF-GW-22-10212020		10/21/2020	N	D								< 12.5	U	< 0.378	U	< 0.313	U	14.5		< 0.182	U	< 120	U*
22	GAF-GW-22-10212020		10/21/2020	N	T		< 5.00	U	191		191		< 12.5	U	< 0.378	U	< 0.313	U	13.4		< 0.182	U	< 250	U*

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					Parameter	Cadmium		Calcium		Chloride		Chromium		Cobalt		Copper		Fluoride		Iron		Lead	
					Unit	µg/L		µg/L		mg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
19R	GAF-GW-19R-01152020	39.5-49.5	1/15/2020	N	D	4.65		443000				< 1.53	U	202		10.4				616000		2.28	
19R	GAF-GW-19R-01152020		1/15/2020	N	T	6.07		434000		2.62		< 1.53	U	252		11.7		332		573000		2.22	
19R	GAF-GW-19R-03182020		3/18/2020	N	T																		
19R	GAF-GW-19R-04222020		4/22/2020	N	D	4.89		436000				< 1.53	U	215		9.01				520000		2.08	
19R	GAF-GW-19R-04222020		4/22/2020	N	T	4.45		452000		2.05	J	< 1.53	U	213		< 9.11	U*	368		520000		< 1.60	U*
19R	GAF-GW-19R-06162020		6/16/2020	N	T	4.40		417000		2.12	J	< 1.53	U	193		8.00		289		481000		< 1.78	U*
19R	GAF-GW-19R-07142020		7/14/2020	N	D	5.79		457000				< 3.06	U	276	J	9.37						1.74	J
19R	GAF-GW-19R-07142020		7/14/2020	N	T	4.10		473000		2.63		< 3.06	U	177	J	< 9.62	U*	498				1.87	J
19R	GAF-GW-19R-08172020		8/17/2020	N	D	3.71		441000				< 1.53	U	167		6.34				523000		1.59	
19R	GAF-GW-19R-08172020		8/17/2020	N	T	4.67		467000		2.11	J	< 1.53	U	214		7.98		< 167	U*	529000		1.61	
19R	GAF-GW-19R-08182020		8/18/2020	N	T																		
19R	GAF-GW-19R-10212020		10/21/2020	N	D	4.54		415000				< 1.53	U	203		7.01				446000		1.50	
19R	GAF-GW-19R-10212020		10/21/2020	N	T	4.14		422000		2.26	J	< 1.53	U	186		7.41		227	J	459000		1.50	
20	GAF-GW-20-01162020	42-52	1/16/2020	N	D	< 0.217	U	376000				< 1.53	U	102		< 0.627	U			24900		< 0.147	U*
20	GAF-GW-20-01162020		1/16/2020	N	T	< 0.217	U	385000		4.28		< 1.53	U	126		< 0.627	U	58.4	J	36100		< 0.228	U*
20	GAF-GW-20-04222020		4/22/2020	N	D	< 0.217	U	377000				< 1.53	U	124		< 0.627	U			34600		< 0.128	U
20	GAF-GW-20-04222020		4/22/2020	N	T	< 0.217	U	369000		4.36		< 1.53	U	120		< 0.627	U	69.0	J	34800		< 0.128	U
20	GAF-GW-903C-04222020		4/22/2020	FD	D	< 0.217	U	389000				< 1.53	U	122		< 0.627	U			34000		0.139	J
20	GAF-GW-903C-04222020		4/22/2020	FD	T	< 0.217	U	360000		4.03		< 1.53	U	118		< 0.627	U	67.9	J	33400		< 0.142	U*
20	GAF-GW-20-06172020		6/17/2020	N	D	< 0.217	U	393000	J			< 1.53	U	104		< 2.30	U*			28300	J	0.171	J
20	GAF-GW-20-06172020		6/17/2020	N	T	< 0.217	U	390000		4.60		< 1.53	U	103		< 0.627	U	50.9	J	30300		< 0.131	U*
20	GAF-GW-20-07152020		7/15/2020	N	T	< 0.217	U	379000		4.43		< 1.53	U	103		< 0.627	U	< 53.1	U*			< 0.128	U
20	GAF-GW-903B-08172020		8/17/2020	FD	D	< 0.217	U	402000				< 1.53	U	114		< 0.627	U			37500		< 0.128	U
20	GAF-GW-903B-08172020		8/17/2020	FD	T	< 0.217	U	412000		4.38		< 1.53	U	112		< 0.627	U	< 44.1	U*	34800		< 0.128	U
20	GAF-GW-20-08172020		8/17/2020	N	D	< 0.217	U	382000				< 1.53	U	110		< 0.627	U			34900		< 0.128	U
20	GAF-GW-20-08172020		8/17/2020	N	T	< 0.217	U	388000		4.47		< 1.53	U	105		< 0.627	U	< 50.6	U*	32200		< 0.128	U
20	GAF-GW-903A-10212020		10/21/2020	FD	D	< 0.217	U	372000				< 1.53	U	90.7		< 0.627	U			19200		< 0.128	U
20	GAF-GW-903A-10212020		10/21/2020	FD	T	< 0.217	U	379000		4.53		< 1.53	U	96.0		< 0.627	U	84.6	J	20800		< 0.128	U
20	GAF-GW-20-10212020		10/21/2020	N	D	< 0.217	U	371000				< 1.53	U	94.4		< 0.627	U			20500		< 0.128	U
20	GAF-GW-20-10212020		10/21/2020	N	T	< 0.217	U	364000		4.50		< 1.53	U	88.9		< 0.627	U	63.2	J	18500		< 0.128	U
22	GAF-GW-22-01162020	39-49	1/16/2020	N	D	< 0.217	U	79400				< 1.53	U	< 0.134	U	< 0.627	U			< 19.5	U	< 0.128	U
22	GAF-GW-22-01162020		1/16/2020	N	T	< 0.217	U	77700		8.57		1.54	J	< 0.134	U	< 1.56	U*	89.2	J	< 19.5	U	< 0.162	U*
22	GAF-GW-22-04232020		4/23/2020	N	D	< 0.217	U	74100				< 1.53	U	< 0.134	U	1.15	J			< 19.5	U	< 0.128	U
22	GAF-GW-22-04232020		4/23/2020	N	T	< 0.217	U	74000		9.05		< 1.53	U	< 0.134	U	< 0.977	U*	81.9	J	< 19.5	U	< 0.128	U
22	GAF-GW-22-06162020		6/16/2020	N	D	< 0.217	U	77200				< 1.53	U	0.138	J	< 1.34	U*			< 19.5	U	< 0.128	U
22	GAF-GW-22-06162020		6/16/2020	N	T	< 0.217	U	76300		8.21		< 1.53	U	0.146	J	< 1.63	U*	76.2	J	< 33.4	U*	< 0.254	U*
22	GAF-GW-22-07152020		7/15/2020	N	T	< 0.217	U	76400		10.2		< 1.53	U	< 0.134	U	< 1.41	U*	< 111	U*			< 0.128	U
22	GAF-GW-22-08182020		8/18/2020	N	D	< 0.217	U	79900				< 1.53	U	< 0.134	U	< 0.627	U			< 19.5	U	0.170	J
22	GAF-GW-22-08182020		8/18/2020	N	T	< 0.217	U	81600		8.92		< 1.53	U	< 0.134	U	< 0.627	U	< 43.3	U*	< 19.5	U	< 0.128	U
22	GAF-GW-22-10212020		10/21/2020	N	D	< 0.217	U	73100				< 1.53	U	< 0.134	U	< 0.627	U			< 19.5	U	< 0.128	U
22	GAF-GW-22-10212020		10/21/2020	N	T	< 0.217	U	71400		7.24		< 1.53	U	< 0.134	U	< 0.627	U	58.7	J	45.5	J	< 0.128	U

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					Parameter	Lithium		Magnesium		Manganese		Mercury		Molybdenum		Nickel		nitrate-nitrite nitrogen		Nitrogen, Kjeldahl, Total		Phosphate as PO4	
					Unit	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		mg/L		mg/L		mg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
19R	GAF-GW-19R-01152020	39.5-49.5	1/15/2020	N	D	146		25200		18100		< 0.101	U	< 0.610	U	191							
19R	GAF-GW-19R-01152020		1/15/2020	N	T	137		26300		22300		< 0.101	U	< 0.610	U	197		< 0.0650	U	< 1.28	U*	< 0.114	U
19R	GAF-GW-19R-03182020		3/18/2020	N	T																		
19R	GAF-GW-19R-04222020		4/22/2020	N	D	123		23900		18300		< 0.130	U	< 0.610	U	156							
19R	GAF-GW-19R-04222020		4/22/2020	N	T	125		25900		16800		< 0.130	U	< 0.610	U	160		< 0.0650	U	0.546		< 0.442	U*
19R	GAF-GW-19R-06162020		6/16/2020	N	T	130		21900		15100		< 0.130	U	< 0.610	U	159		< 0.0650	U	< 0.963	U*	0.155	J
19R	GAF-GW-19R-07142020		7/14/2020	N	D	126		25200				< 0.130	U	< 1.22	U	176	J						
19R	GAF-GW-19R-07142020		7/14/2020	N	T	140		23600				0.316		< 1.22	U	145	J						
19R	GAF-GW-19R-08172020		8/17/2020	N	D	129		21500		14600	J	< 0.130	U	< 0.610	U	131							
19R	GAF-GW-19R-08172020		8/17/2020	N	T	130		24000		18700		< 0.130	U	< 0.610	U	150		< 0.0650	U	0.829		0.244	J
19R	GAF-GW-19R-08182020		8/18/2020	N	T																		
19R	GAF-GW-19R-10212020		10/21/2020	N	D	131		22700		17800	J	< 0.130	U	< 0.610	U	140							
19R	GAF-GW-19R-10212020		10/21/2020	N	T	133		22000		15800	J	< 0.130	UJ	< 0.610	U	135		< 0.0650	U	0.880		0.159	J
20	GAF-GW-20-01162020	42-52	1/16/2020	N	D	3.43	J	25700		11200		< 0.101	U	5.30		17.2							
20	GAF-GW-20-01162020		1/16/2020	N	T	6.08		27600		12700		< 0.101	U	5.18		20.4		< 0.0650	U	< 0.754	U*	< 0.114	U
20	GAF-GW-20-04222020		4/22/2020	N	D	8.22		27900		12200		< 0.130	U	5.47		20.0							
20	GAF-GW-20-04222020		4/22/2020	N	T	7.92		27400		12000		< 0.130	U	5.29		19.3		< 0.0650	U	0.636		< 0.129	U*
20	GAF-GW-903C-04222020		4/22/2020	FD	D	8.01		27700		12000		< 0.130	U	5.18		20.0							
20	GAF-GW-903C-04222020		4/22/2020	FD	T	8.04		27400		11600		< 0.130	U	4.88	J	19.0		< 0.0650	U	0.908		< 0.146	U*
20	GAF-GW-20-06172020		6/17/2020	N	D	8.70		25300	J	11200	J	< 0.130	U	5.78		16.7							
20	GAF-GW-20-06172020		6/17/2020	N	T	9.44		26800		10000	J	< 0.130	U	5.89		17.1		< 0.0650	U	< 0.486	U*	< 0.114	U
20	GAF-GW-20-07152020		7/15/2020	N	T	6.78		25600				< 0.130	U	5.36		16.9							
20	GAF-GW-903B-08172020		8/17/2020	FD	D	4.99	J	27100		12500	J	< 0.130	U	5.20		18.6							
20	GAF-GW-903B-08172020		8/17/2020	FD	T	6.20		27800		12500		< 0.130	U	5.65		18.4		< 0.0650	U	0.504		< 0.114	U
20	GAF-GW-20-08172020		8/17/2020	N	D	5.05		27000		12500	J	< 0.130	U	5.17		18.5							
20	GAF-GW-20-08172020		8/17/2020	N	T	6.27		25600		11600		< 0.130	U	5.22		17.2		< 0.0650	U	0.448	J	< 0.114	U
20	GAF-GW-903A-10212020		10/21/2020	FD	D	6.39		24300		9950		< 0.130	U	5.20		14.9							
20	GAF-GW-903A-10212020		10/21/2020	FD	T	6.63		25000		10400		< 0.130	UJ	5.26		16.0		< 0.0650	U	0.629		< 0.114	U
20	GAF-GW-20-10212020		10/21/2020	N	D	6.40		24800		10400		< 0.130	U	5.24		15.1							
20	GAF-GW-20-10212020		10/21/2020	N	T	6.65		24300		10000		< 0.130	UJ	5.22		15.3		< 0.0650	U	0.748		< 0.114	U
22	GAF-GW-22-01162020	39-49	1/16/2020	N	D	< 3.39	U	6870		< 0.866	U	< 0.101	U	< 0.610	U	< 0.336	U						
22	GAF-GW-22-01162020		1/16/2020	N	T	< 3.39	U	6490		< 2.05	U*	< 0.101	U	< 0.610	U	< 0.336	U	1.83		< 0.418	U*	< 0.114	U
22	GAF-GW-22-04232020		4/23/2020	N	D	< 6.55	U*	6160		< 2.08	U*	< 0.130	U	< 0.610	U	< 0.336	U						
22	GAF-GW-22-04232020		4/23/2020	N	T	< 6.19	U*	6080		< 3.90	U*	< 0.130	U	< 0.610	U	< 0.336	U	1.66	J	< 0.704	U*	< 0.114	U
22	GAF-GW-22-06162020		6/16/2020	N	D	< 3.39	U	5910		7.62		< 0.130	U	< 0.610	U	< 0.336	U						
22	GAF-GW-22-06162020		6/16/2020	N	T	< 3.39	U	5910		< 9.51	U*	< 0.130	U	< 0.610	U	< 0.336	U	1.73		< 0.260	U	< 0.114	U
22	GAF-GW-22-07152020		7/15/2020	N	T	< 3.39	U	6460				< 0.130	U	< 0.610	U	< 0.336	U						
22	GAF-GW-22-08182020		8/18/2020	N	D	< 3.39	U	6370		< 0.866	U	< 0.130	U	< 0.610	U	< 0.336	U						
22	GAF-GW-22-08182020		8/18/2020	N	T	< 3.39	U	6510		< 0.866	U	< 0.130	U	< 0.610	U	< 0.336	U	1.74		< 0.260	U	< 0.114	U
22	GAF-GW-22-10212020		10/21/2020	N	D	< 3.39	U	5820		< 1.23	U*	< 0.130	U	< 0.610	U	< 0.336	U						
22	GAF-GW-22-10212020		10/21/2020	N	T	< 3.39	U	5620		< 2.68	U*	< 0.130	UJ	< 0.610	U	< 0.336	U	1.68		< 0.260	U	< 0.114	U

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					Parameter	Phosphorus		Potassium		Radium-226		Radium 228		Radium 226 + Radium 228		Selenium		Silicon		Silver		Sodium	
					Unit	mg/L		µg/L		pCi/L		pCi/L		pCi/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
19R	GAF-GW-19R-01152020	39.5-49.5	1/15/2020	N	D			17400		0.425		1.50		1.93		< 1.51	U	19100		< 0.177	U	8460	
19R	GAF-GW-19R-01152020		1/15/2020	N	T	< 0.0320	U	16800		0.498		1.51		2.01		1.66	J	18600		< 0.177	U	8580	
19R	GAF-GW-19R-03182020		3/18/2020	N	T																		
19R	GAF-GW-19R-04222020		4/22/2020	N	D			15900		0.526		1.02	J	1.55	J	< 1.51	U	17800		< 0.177	U	8860	
19R	GAF-GW-19R-04222020		4/22/2020	N	T	< 0.0320	U	16100		0.346		1.04		1.39		< 1.51	U	18000		< 0.177	U	8780	
19R	GAF-GW-19R-06162020		6/16/2020	N	T	< 0.0320	U	15400		0.449		1.31		1.76		< 1.51	U	17400		< 0.177	U	7670	
19R	GAF-GW-19R-07142020		7/14/2020	N	D			14900		0.472		2.80	J	3.27	J	< 3.02	U			< 0.354	U	8010	
19R	GAF-GW-19R-07142020		7/14/2020	N	T			16500		0.487		1.41	J	1.89	J	< 3.02	U			< 0.354	U	8030	
19R	GAF-GW-19R-08172020		8/17/2020	N	D			16100		0.433		1.55		1.98		< 1.51	U	18700		< 0.177	U	7710	
19R	GAF-GW-19R-08172020		8/17/2020	N	T	< 0.0320	U	16600		0.586		1.53		2.12		< 1.51	U	19000		< 0.177	U	8390	
19R	GAF-GW-19R-08182020		8/18/2020	N	T																		
19R	GAF-GW-19R-10212020		10/21/2020	N	D			15500		0.453		0.831		1.28		< 1.51	U	18000		< 0.177	U	7620	
19R	GAF-GW-19R-10212020		10/21/2020	N	T	< 0.0320	U	15500		0.493	U*	1.20		1.69	J	< 1.51	U	18200		< 0.177	U	7470	
20	GAF-GW-20-01162020	42-52	1/16/2020	N	D			10600		0.260		0.752	U*	1.01	J	< 1.51	U	3050		< 0.177	U	11300	
20	GAF-GW-20-01162020		1/16/2020	N	T	< 0.0320	U	11500		0.278		0.336	U	0.614	J	< 1.51	U	3060		< 0.177	U	11400	
20	GAF-GW-20-04222020		4/22/2020	N	D			12500		0.190		0.320	UJ	0.510	J	< 1.51	U	3410		< 0.177	U	11300	
20	GAF-GW-20-04222020		4/22/2020	N	T	< 0.0320	U	12500		0.106	U	-0.0367	U	0.106	U	< 1.51	U	3120		< 0.177	U	10900	
20	GAF-GW-903C-04222020		4/22/2020	FD	D			12200		0.200		0.0659	UJ	0.266	J	< 1.51	U	3370		< 0.177	U	11400	
20	GAF-GW-903C-04222020		4/22/2020	FD	T	< 0.0320	U	12100		0.229		0.324	U	0.553	J	< 1.51	U	3310		< 0.177	U	11100	
20	GAF-GW-20-06172020		6/17/2020	N	D			12100	J	0.280	J	0.280	U	0.560	J	< 1.51	U	3510	J	< 0.177	U	10900	J
20	GAF-GW-20-06172020		6/17/2020	N	T	< 0.0397	U*	11900		0.0294	UJ	-0.00705	U	0.0294	UJ	< 1.51	U	3580		< 0.177	U	11300	
20	GAF-GW-20-07152020		7/15/2020	N	T			11100		0.217		0.907	U*	1.12	J	< 1.51	U			< 0.177	U	10400	
20	GAF-GW-903B-08172020		8/17/2020	FD	D			12500		0.226		0.809	U*	1.03	J	< 1.51	U	3720		< 0.177	U	11600	
20	GAF-GW-903B-08172020		8/17/2020	FD	T	< 0.0320	U	13000		0.200		1.07		1.27		< 1.51	U	3720		< 0.177	U	11800	
20	GAF-GW-20-08172020		8/17/2020	N	D			12600		0.221		0.473	U	0.694	J	< 1.51	U	3420		< 0.177	U	11400	
20	GAF-GW-20-08172020		8/17/2020	N	T	< 0.0320	U	12200		0.164	U	0.731	U	0.894	U	< 1.51	U	3340		< 0.177	U	10700	
20	GAF-GW-903A-10212020		10/21/2020	FD	D			10800		0.176		0.0299	U	0.205	J	< 1.51	U	3270		< 0.177	U	10700	
20	GAF-GW-903A-10212020		10/21/2020	FD	T	< 0.0320	U	11300		0.121	U	0.369	U	0.490	U	< 1.51	U	3280		< 0.177	U	10900	
20	GAF-GW-20-10212020		10/21/2020	N	D			11100		0.200		0.344	U	0.544	J	< 1.51	U	3350		< 0.177	U	10800	
20	GAF-GW-20-10212020		10/21/2020	N	T	< 0.0320	U	10800		0.110	U	0.0380	U	0.148	U	< 1.51	U	3280		< 0.177	U	10600	
22	GAF-GW-22-01162020	39-49	1/16/2020	N	D			701		-0.0443	U	0.361	U	0.361	U	< 1.51	U	3390		< 0.177	U	3830	
22	GAF-GW-22-01162020		1/16/2020	N	T	< 0.0690	U*	683		-0.0123	U	-0.0664	U	0.000	U	< 1.51	U	3310		< 0.177	U	3570	
22	GAF-GW-22-04232020		4/23/2020	N	D			714		0.117	U	0.125	U	0.242	U	< 1.51	U	3490		< 0.177	U	3100	
22	GAF-GW-22-04232020		4/23/2020	N	T	0.0682	J	704		0.0165	U	-0.0922	U	0.0165	U	< 1.51	U	3490		< 0.177	U	3170	
22	GAF-GW-22-06162020		6/16/2020	N	D			616		0.107	U	0.518	U*	0.625	U*	< 1.51	U	3860		< 0.177	U	3160	
22	GAF-GW-22-06162020		6/16/2020	N	T	0.0546	J	575		0.0327	U	0.184	U	0.216	U	< 1.51	U	3730		< 0.177	U	3100	
22	GAF-GW-22-07152020		7/15/2020	N	T			746		0.00403	U	1.29	U*	1.30	U*	< 1.51	U			< 0.177	U	3650	
22	GAF-GW-22-08182020		8/18/2020	N	D			812		0.224		0.157	U	0.381	J	< 1.51	U	3770		< 0.177	U	3880	
22	GAF-GW-22-08182020		8/18/2020	N	T	< 0.0320	U	809		0.105	U	0.140	U	0.245	U	< 1.51	U	3990		< 0.177	U	3890	
22	GAF-GW-22-10212020		10/21/2020	N	D			697		0.0762	U	-0.156	U	0.0762	U	< 1.51	U	3620		< 0.177	U	3500	
22	GAF-GW-22-10212020		10/21/2020	N	T	< 0.0320	U	647		0.0465	U	0.285	U	0.332	U	< 1.51	U	3590		< 0.177	U	3200	

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					Parameter	Strontium		Sulfate		Sulfide		Thallium		Total Dissolved Solids		Total Organic Carbon		Total Suspended Solids		Vanadium		Zinc	
					Unit	µg/L		mg/L		mg/L		µg/L		mg/L		mg/L		mg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
19R	GAF-GW-19R-01152020	39.5-49.5	1/15/2020	N	D	1180						1.45								25.0		764	
19R	GAF-GW-19R-01152020		1/15/2020	N	T	1160		2600		43.8		< 1.13	U*	4000	J	0.686	J	6.00		22.9		727	
19R	GAF-GW-19R-03182020		3/18/2020	N	T																		
19R	GAF-GW-19R-04222020		4/22/2020	N	D	1150						1.18								20.7		601	
19R	GAF-GW-19R-04222020		4/22/2020	N	T	1250		2430	J	59.8		0.676	J	3540	J	0.732	J	4.40		22.5		597	
19R	GAF-GW-19R-06162020		6/16/2020	N	T	1200	J	2500		65.7		< 1.23	U*	2670		0.817	J	1.50		21.7		636	
19R	GAF-GW-19R-07142020		7/14/2020	N	D							1.24	J							17.3		607	
19R	GAF-GW-19R-07142020		7/14/2020	N	T			2420				1.40	J	3830	J			1.40		20.2		620	
19R	GAF-GW-19R-08172020		8/17/2020	N	D	966	J					< 0.947	U*							20.4		569	
19R	GAF-GW-19R-08172020		8/17/2020	N	T	970	J	2550		20.1		< 0.952	U*	2550		0.743	J	1.20		20.4		594	
19R	GAF-GW-19R-08182020		8/18/2020	N	T																		
19R	GAF-GW-19R-10212020		10/21/2020	N	D	1200						0.938	J							18.7		552	
19R	GAF-GW-19R-10212020		10/21/2020	N	T	1200		2360		< 6.70	U	1.14		3570		0.745	J	0.700		18.1		554	
20	GAF-GW-20-01162020	42-52	1/16/2020	N	D	1130						< 0.148	U							< 0.991	U	17.0	
20	GAF-GW-20-01162020		1/16/2020	N	T	1180		1090		< 1.34	U	< 0.261	U*	1610		0.840	J	3.20		< 0.991	U	< 19.3	U*
20	GAF-GW-20-04222020		4/22/2020	N	D	1180						< 0.148	U							< 0.991	U	20.2	J
20	GAF-GW-20-04222020		4/22/2020	N	T	1180		991	J	< 1.34	U	< 0.148	U	1610		0.809	J	2.70		< 0.991	U	< 18.7	U*
20	GAF-GW-903C-04222020		4/22/2020	FD	D	1170						< 0.148	U							< 0.991	U	35.7	J
20	GAF-GW-903C-04222020		4/22/2020	FD	T	1140		956	J	< 1.34	U	< 0.148	U	1340		0.825	J	2.60		< 0.991	U	< 29.4	U*
20	GAF-GW-20-06172020		6/17/2020	N	D	1240	J					< 0.149	U*							< 0.991	U	14.8	
20	GAF-GW-20-06172020		6/17/2020	N	T	1150		1080		< 1.34	UJ	< 0.152	U*	1620		0.704	J	0.600		< 0.991	U	< 12.3	U*
20	GAF-GW-20-07152020		7/15/2020	N	T			993				< 0.148	U	1680				12.2		< 0.991	U	13.8	
20	GAF-GW-903B-08172020		8/17/2020	FD	D	1130	J					< 0.148	U							< 0.991	U	19.5	
20	GAF-GW-903B-08172020		8/17/2020	FD	T	1170	J	1170		< 1.34	U	< 0.148	U	1610		0.939	J	3.70	J	< 0.991	U	17.8	
20	GAF-GW-20-08172020		8/17/2020	N	D	1130	J					< 0.148	U							< 0.991	U	15.1	
20	GAF-GW-20-08172020		8/17/2020	N	T	1140	J	1070		< 1.34	U	< 0.267	U*	1620		1.11		5.30	J	< 0.991	U	14.2	
20	GAF-GW-903A-10212020		10/21/2020	FD	D	1130						< 0.148	U							< 0.991	U	9.61	
20	GAF-GW-903A-10212020		10/21/2020	FD	T	1150		1070		< 6.70	U	< 0.148	U	1630		0.811	J	0.600	J	< 0.991	U	12.0	
20	GAF-GW-20-10212020		10/21/2020	N	D	1140						0.212	J							< 0.991	U	11.6	
20	GAF-GW-20-10212020		10/21/2020	N	T	1120		1000		< 6.70	U	0.319	J	1710		0.845	J	1.50	J	< 0.991	U	10.6	
22	GAF-GW-22-01162020	39-49	1/16/2020	N	D	104						< 0.148	U							< 0.991	U	< 3.22	U
22	GAF-GW-22-01162020		1/16/2020	N	T	98.4		12.0		< 1.34	U	< 0.148	U	227		< 0.508	U	< 1.00	U	< 0.991	U	< 3.22	U
22	GAF-GW-22-04232020		4/23/2020	N	D	93.5						< 0.148	U							< 0.991	U	< 3.22	U
22	GAF-GW-22-04232020		4/23/2020	N	T	91.8		13.6		< 1.34	U	< 0.148	U	301		0.537	J	< 0.500	U	< 0.991	U	< 3.22	U
22	GAF-GW-22-06162020		6/16/2020	N	D	95.0						< 0.210	U*							< 0.991	U	< 3.22	U
22	GAF-GW-22-06162020		6/16/2020	N	T	92.4	J	10.0		< 1.34	U	< 0.148	U	293		< 0.508	U	< 0.500	U	< 0.991	U	3.24	J
22	GAF-GW-22-07152020		7/15/2020	N	T			11.9				< 0.148	U	236				2.00		< 0.991	U	< 3.22	U
22	GAF-GW-22-08182020		8/18/2020	N	D	99.0						0.386	J							< 0.991	U	3.43	J
22	GAF-GW-22-08182020		8/18/2020	N	T	102		11.2		< 1.34	U	0.199	J	306		< 0.508	U	< 1.00	U	< 0.991	U	< 3.22	U
22	GAF-GW-22-10212020		10/21/2020	N	D	90.9						< 0.148	U							< 0.991	U	< 3.22	U
22	GAF-GW-22-10212020		10/21/2020	N	T	88.4		8.42		1.42	J	< 0.148	U	236		< 0.508	U	< 0.500	U	< 0.991	U	< 3.22	U

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					Parameter	pH, Field	aerated pH	Dissolved Oxygen	ORP	Specific Conductance, Field	Temperature	Turbidity, field	Sulfide	Iron, Ferrous	Carbon Dioxide	Acidity		Alkalinity, Carbonate	
					Unit	pH units	pH units	mg/L	mV	umhos/cm	deg c	NTU	mg/L	mg/L	mg/L	mg/L		mg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Validator Qualifier	Result	Validator Qualifier
26	GAF-GW-26-01142020	93-103	1/14/2020	N	D														
26	GAF-GW-26-01142020		1/14/2020	N	T	7.21		0.16	-128.9	944	15.9	55.9						< 5.00	U
26	GAF-GW-903A-01142020		1/14/2020	FD	D														
26	GAF-GW-903A-01142020		1/14/2020	FD	T													< 5.00	U
26	GAF-GW-26-04222020		4/22/2020	N	D														
26	GAF-GW-26-04222020		4/22/2020	N	T	7.04		0.55	-145.2	1112	16.7	21.9						< 5.00	U
26	GAF-GW-26-07142020		7/14/2020	N	T	7.57	7.61	0.81	-165.4	999.2	23.3	9.77	0	7	>100				
26	GAF-GW-26-07242020		7/24/2020	N	D														
26	GAF-GW-26-07242020		7/24/2020	N	T	7.12		0.87	-117.0	1329	18.0	18.7						< 5.00	U
26	GAF-GW-903-07242020		7/24/2020	FD	D														
26	GAF-GW-903-07242020		7/24/2020	FD	T													< 5.00	U
26	GAF-GW-26-10212020		10/21/2020	N	D														
26	GAF-GW-26-10212020		10/21/2020	N	T	7.68		0.39	-110.2	919	18.5	4.71						< 5.00	U
27	GAF-GW-27-01142020	77-87	1/14/2020	N	T	6.81		0.39	-40.2	1374	17.0	3.79						< 5.00	U
27	GAF-GW-27-04222020		4/22/2020	N	D														
27	GAF-GW-27-04222020		4/22/2020	N	T	6.66		0.29	-21.9	1980	18.1	0.31						< 5.00	U
27	GAF-GW-27-07152020		7/15/2020	N	T	7.26	7.38	0.38	-41.6	1833	18.7	1.72	0	3	60			< 5.00	U
27	GAF-GW-27-10212020		10/21/2020	N	T	6.90		0.23	-8.6	1735	20.9	0.68						< 5.00	U
GAF-439U	GAF-GW-439U-01212020	29.5-39.5	1/21/2020	N	D														
GAF-439U	GAF-GW-439U-01212020		1/21/2020	N	T	6.89	6.95	0.44	-84.9	1209	12.5	54.2		6	12.5	-665		< 5.00	U
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	D														
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	T	6.67	6.67	0.45	-76.2	1887	15.1	252	8	7	13.0	-422		< 5.00	U
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	D														
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	T	6.60	6.65	0.35	-93.3	1869	17.6	OR	0	5	>100	-479		< 5.00	U
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	D														
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	T	6.66	6.59	0.77	-50.8	1840	18.0	122	0	4.5	>100	-446		< 5.00	U
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	D														
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	T	6.67	6.65	0.36	-29.0	1865	18.9	231	0	5.0	>100	-484		< 5.00	U
GAF-440U	GAF-GW-440U-01172020	41-51	1/17/2020	N	D														
GAF-440U	GAF-GW-440U-01172020		1/17/2020	N	T	6.70	6.78	1.27	141.9	1156	12.2	240		0.5	62.5	-503		< 5.00	U
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	D														
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	T	6.53	6.53	0.29	8.9	1879	16.6	56.4	>10	2.5	55	-754		< 5.00	U
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	D														
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	T	6.48	6.39	0.37	-21.9	1826	19.1	OR	0	1.0	>100	-369		< 5.00	U
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	D														
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	T	6.77	6.73	0.32	0.9	1821	19.3	139	0	1.5	72	-688		< 5.00	U
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	D														
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	T	6.67	6.67	0.89	103.7	1903	18.1	54.4	0	1.0	100	-523		< 5.00	U

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					Parameter	Alkalinity, Hydroxide as		Alkalinity, Total as CaCO3		Alkalinity,Bicarbonate (CaCO3)		Aluminum		Antimony		Arsenic		Barium		Beryllium		Boron	
					Unit	mg/L		mg/L		mg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
26	GAF-GW-26-01142020	93-103	1/14/2020	N	D									< 0.720	U*	2.34	J	29.9		0.427	J	6400	
26	GAF-GW-26-01142020		1/14/2020	N	T			135		135				< 0.378	U	< 1.75	U*	33.4		< 0.448	U*	6090	
26	GAF-GW-903A-01142020		1/14/2020	FD	D									< 0.378	U	< 1.28	U*	26.4		< 0.182	U	6550	
26	GAF-GW-903A-01142020		1/14/2020	FD	T			145		145				< 0.378	U	< 1.80	U*	34.1		< 0.422	U*	6510	
26	GAF-GW-26-04222020		4/22/2020	N	D									< 0.378	U	0.810	J	25.3		< 0.182	U	6350	
26	GAF-GW-26-04222020		4/22/2020	N	T			125		125				< 0.378	U	0.943	J	26.3		< 0.182	U	6160	
26	GAF-GW-26-07142020		7/14/2020	N	T																		
26	GAF-GW-26-07242020		7/24/2020	N	D									< 0.378	U	0.761	J	30.5		< 0.182	U	6120	
26	GAF-GW-26-07242020		7/24/2020	N	T			173		173				< 0.378	U	1.03		36.7		< 0.182	U	6010	
26	GAF-GW-903-07242020		7/24/2020	FD	D									< 0.378	U	0.733	J	29.9		< 0.182	U	5910	
26	GAF-GW-903-07242020		7/24/2020	FD	T			174		174				< 0.378	U	0.973	J	36.2		< 0.182	U	6100	
26	GAF-GW-26-10212020		10/21/2020	N	D									< 0.378	U	0.867	J	19.0		< 0.182	U	4830	
26	GAF-GW-26-10212020		10/21/2020	N	T			126		126				< 0.378	U	0.740	J	26.5		< 0.182	U	5550	
27	GAF-GW-27-01142020	77-87	1/14/2020	N	T			193		193				< 0.378	U	< 0.501	U*	31.7		< 0.182	U	7760	
27	GAF-GW-27-04222020		4/22/2020	N	D									< 0.378	U	< 0.313	U	30.0		< 0.182	U	6600	
27	GAF-GW-27-04222020		4/22/2020	N	T			229		229				< 0.378	U	< 0.313	U	29.3		< 0.182	U	6360	
27	GAF-GW-27-07152020		7/15/2020	N	T			255		255				< 0.378	U	< 0.313	U	27.3		< 0.182	U	5170	J
27	GAF-GW-27-10212020		10/21/2020	N	T			256		256				< 0.378	U	< 0.313	U	28.0		< 0.182	U	6680	
GAF-439U	GAF-GW-439U-01212020	29.5-39.5	1/21/2020	N	D							< 12.5	U	< 0.378	U	7.07		44.1		< 0.199	U*	1300	
GAF-439U	GAF-GW-439U-01212020		1/21/2020	N	T	< 5.00	U	530		530		1690		2.45		8.22		61.5		< 0.365	U*	1300	
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	D							14.0	J	< 0.378	U	6.59		45.0		< 0.182	U	1530	
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	T	< 5.00	U	512		512		2140		0.943	J	11.5		60.2		0.552	J	1520	
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	D							< 12.5	U	0.504	J	6.51		47.4		< 0.182	U	1400	
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	T	< 5.00	U	547		547		2010		0.700	J	9.73		64.1		< 0.531	U*	1350	
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	D							292		0.628	J	5.27		45.7		< 0.182	U	1350	
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	T	< 5.00	U	521		521		1890		0.914	J	6.90		60.8		0.188	J	1330	
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	D							498		< 0.378	U	6.19		47.9		< 0.182	U	1430	
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	T	< 5.00	U	535		535		5390		1.51	J	10.4		101		0.702	J	1490	
GAF-440U	GAF-GW-440U-01172020	41-51	1/17/2020	N	D							2630	J	34.0	J	0.753	J	55.4		0.215	J	1810	
GAF-440U	GAF-GW-440U-01172020		1/17/2020	N	T	< 5.00	U	563		563		3150	J	14.2	J	< 0.948	U*	53.8		< 0.287	U*	1880	
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	D							< 16.3	U*	< 1.54	U*	< 0.640	U*	33.2		< 0.182	U	1860	
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	T	< 5.00	U	559		559		566		< 2.22	U*	< 0.792	U*	39.3		< 0.182	U	1910	
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	D							185		1.25	J	0.674	J	42.2		< 0.182	U	1800	
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	T	< 5.00	U	575		575		243		1.81	J	0.680	J	42.6		< 0.182	U	1730	
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	D							< 12.5	U	1.32	J	0.671	J	38.7		< 0.182	U	1960	
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	T	< 5.00	U	580		580		480		1.45	J	0.859	J	37.4		< 0.182	U	1790	
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	D							18.7	J	< 0.378	U	0.563	J	34.6		< 0.182	U	1950	J
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	T	< 5.00	U	580		580		188		0.695	J	0.555	J	35.0		< 0.182	U	1930	

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					Parameter	Cadmium		Calcium		Chloride		Chromium		Cobalt		Copper		Fluoride		Iron		Lead	
					Unit	µg/L		µg/L		mg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
26	GAF-GW-26-01142020	93-103	1/14/2020	N	D	< 0.217	U	294000				2.02		8.24		10.2	J					0.756	J
26	GAF-GW-26-01142020		1/14/2020	N	T	0.448	J	304000		3.50		< 1.53	U	10.9		2.38	J	81.8	J			0.823	J
26	GAF-GW-903A-01142020		1/14/2020	FD	D	< 0.217	U	303000				< 1.53	U	8.23		0.972	J					< 0.128	U
26	GAF-GW-903A-01142020		1/14/2020	FD	T	< 0.217	U	299000		3.50		2.14		10.0		1.63	J	91.4	J			0.623	J
26	GAF-GW-26-04222020		4/22/2020	N	D	< 0.217	U	249000				< 1.53	U	3.45		< 0.627	U					< 0.128	U
26	GAF-GW-26-04222020		4/22/2020	N	T	0.273	J	251000		3.24		< 1.53	U	4.62		< 0.627	U	53.2	J			< 0.296	U*
26	GAF-GW-26-07142020		7/14/2020	N	T																		
26	GAF-GW-26-07242020		7/24/2020	N	D	< 0.217	U	302000				< 1.53	U	5.35		< 4.39	U*					< 0.128	U
26	GAF-GW-26-07242020		7/24/2020	N	T	< 0.217	U	321000		4.39		< 1.53	U	12.4		< 5.27	U*	< 87.7	U*			< 0.534	U*
26	GAF-GW-903-07242020		7/24/2020	FD	D	< 0.217	U	291000				< 1.53	U	5.22		< 2.57	U*					< 0.128	U
26	GAF-GW-903-07242020		7/24/2020	FD	T	0.218	J	323000		4.37		< 1.53	U	12.0		< 4.26	U*	< 76.4	U*			< 0.522	U*
26	GAF-GW-26-10212020		10/21/2020	N	D	< 0.217	U	187000				< 1.53	U	0.969		< 0.627	U					0.136	J
26	GAF-GW-26-10212020		10/21/2020	N	T	< 0.217	U	269000		3.96		< 1.53	U	3.58		< 0.627	U	< 44.0	U			< 0.128	U
27	GAF-GW-27-01142020	77-87	1/14/2020	N	T	< 0.217	U	465000		6.11		< 1.53	U	< 0.134	U	1.08	J	146				< 0.128	U
27	GAF-GW-27-04222020		4/22/2020	N	D	< 0.217	U	421000				< 1.53	U	< 0.134	U	< 0.627	U					< 0.128	U
27	GAF-GW-27-04222020		4/22/2020	N	T	< 0.217	U	419000		5.60		< 1.53	U	< 0.134	U	< 0.627	U	144				< 0.128	U
27	GAF-GW-27-07152020		7/15/2020	N	T	< 0.217	U	423000		5.44		< 1.53	U	< 0.134	U	< 0.627	U	< 135	U*			< 0.128	U
27	GAF-GW-27-10212020		10/21/2020	N	T	< 0.217	U	441000		5.39		< 1.53	U	< 0.134	U	< 0.627	U	122				< 0.128	U
GAF-439U	GAF-GW-439U-01212020	29.5-39.5	1/21/2020	N	D	< 0.217	U	319000				< 1.53	U	8.23		< 0.627	U			6390		< 0.128	U
GAF-439U	GAF-GW-439U-01212020		1/21/2020	N	T	< 0.217	U	327000		25.9		2.48		9.33		< 1.26	U*	153		8900		1.84	
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	D	< 0.217	U	303000				< 1.53	U	9.97		< 0.627	U			6470		< 0.128	U
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	T	0.348	J	309000		26.2		4.86		12.8		< 4.19	U*	158		9030		5.84	
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	D	< 0.217	U	321000				< 1.53	U	11.2		< 0.627	U			6340		< 0.128	U
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	T	0.278	J	326000		30.4		4.44		12.6		2.85		163		8750		4.23	
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	D	< 0.217	U	301000				< 1.53	U	10.4		< 0.627	U			6220		0.347	J
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	T	< 0.217	U	306000		26.9		3.08		11.6		1.52	J	< 73.6	U*	7880		2.10	
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	D	< 0.217	U	316000				< 1.53	U	10.5		< 0.627	U			6650		0.702	J
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	T	0.359	J	327000		27.3		8.79		12.7		6.15		121	J	13400		7.34	
GAF-440U	GAF-GW-440U-01172020	41-51	1/17/2020	N	D	< 0.217	U	342000				2.48		15.6		2.27				2750		< 1.16	U*
GAF-440U	GAF-GW-440U-01172020		1/17/2020	N	T	< 0.217	U	345000		36.6		3.27		20.5		2.58		203		3510		1.42	
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	D	< 0.217	U	324000				< 1.53	U	23.6		< 0.656	U*			788		< 0.128	U
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	T	< 0.217	U	341000		41.3		< 1.53	U	24.6		< 1.21	U*	270		1690		< 0.439	U*
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	D	< 0.217	U	340000				< 1.53	U	26.1		1.48	J			1220		0.318	J
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	T	< 0.217	U	340000		48.7		< 1.53	U	25.6		< 0.627	U	299		1620		0.350	J
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	D	< 0.217	U	339000				< 1.53	U	26.0		0.840	J			1060		< 0.128	U
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	T	< 0.217	U	326000		41.5		< 1.53	U	25.6		1.22	J	< 95.3	U*	1610		0.465	J
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	D	< 0.217	U	347000				< 1.53	U	25.0		< 0.627	U			1170		< 0.128	U
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	T	< 0.217	U	337000		40.7		< 1.53	U	24.6		< 0.627	U	206		1350		< 0.128	U

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					Parameter	Lithium		Magnesium		Manganese		Mercury		Molybdenum		Nickel		nitrate-nitrite nitrogen		Nitrogen, Kjeldahl, Total		Phosphate as PO4	
					Unit	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		mg/L		mg/L		mg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
26	GAF-GW-26-01142020	93-103	1/14/2020	N	D	4.97	J	22900				< 0.101	U	14.9		5.08	J						
26	GAF-GW-26-01142020		1/14/2020	N	T	4.06	J	21700				< 0.101	U	15.8		3.52	J						
26	GAF-GW-903A-01142020		1/14/2020	FD	D	3.99	J	21800				< 0.101	U	15.9		2.27	J						
26	GAF-GW-903A-01142020		1/14/2020	FD	T	5.75		21500				< 0.101	U	17.1		5.13	J						
26	GAF-GW-26-04222020		4/22/2020	N	D	3.81	J	16100				< 0.130	U	27.7	J	0.577	J						
26	GAF-GW-26-04222020		4/22/2020	N	T	3.83	J	16000				< 0.130	U	21.6	J	< 1.91	U*						
26	GAF-GW-26-07142020		7/14/2020	N	T																		
26	GAF-GW-26-07242020		7/24/2020	N	D	< 3.39	U	20000				< 0.130	U	11.2		0.682	J						
26	GAF-GW-26-07242020		7/24/2020	N	T	< 3.39	U	20100				< 0.130	U	12.1		4.15							
26	GAF-GW-903-07242020		7/24/2020	FD	D	< 3.39	U	19500				< 0.130	U	10.8		0.826	J						
26	GAF-GW-903-07242020		7/24/2020	FD	T	3.50	J	20200				< 0.130	U	11.9		3.98							
26	GAF-GW-26-10212020		10/21/2020	N	D	< 3.39	U	15400				< 0.130	U	6.74		0.357	J						
26	GAF-GW-26-10212020		10/21/2020	N	T	< 3.39	U	18800				< 0.130	U	8.24		1.21							
27	GAF-GW-27-01142020	77-87	1/14/2020	N	T	6.11		36900				< 0.101	U	1.97	J	0.916	J						
27	GAF-GW-27-04222020		4/22/2020	N	D	5.63		32200				< 0.130	U	1.80	J	< 0.336	U						
27	GAF-GW-27-04222020		4/22/2020	N	T	5.28		32100				< 0.130	U	1.83	J	< 0.336	U						
27	GAF-GW-27-07152020		7/15/2020	N	T	4.81	J	29300				< 0.130	U	1.73	J	< 0.336	U						
27	GAF-GW-27-10212020		10/21/2020	N	T	< 3.39	U	30200				< 0.130	UJ	1.97	J	< 0.336	U						
GAF-439U	GAF-GW-439U-01212020	29.5-39.5	1/21/2020	N	D	3.60	J	32700		10200		< 0.101	U	30.5		1.74							
GAF-439U	GAF-GW-439U-01212020		1/21/2020	N	T	3.49	J	32900		11900		< 0.101	U	31.0		3.18		< 0.0650	U	< 0.260	U	1.15	
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	D	5.00		36000		9230		< 0.130	U	29.2	J	2.21							
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	T	6.10		35900		9570		< 0.130	U	15.5	J	5.19		< 0.0650	U	0.675		2.84	
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	D	3.90	J	35500		9460		< 0.130	U	30.0	J	2.29							
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	T	4.77	J	35500		9870		< 0.130	U	21.8	J	4.39		< 0.0650	U	< 0.782	U*	1.68	
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	D	4.08	J	33600		8540		< 0.130	U	29.1		2.19							
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	T	4.52	J	33700		8910		< 0.130	U	28.9		3.79		< 0.0650	U	0.600		1.01	
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	D	< 3.39	U	33800		9490		< 0.130	UJ	27.9		2.64							
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	T	6.06		33700		10400		< 0.130	UJ	29.2		8.43		< 0.0650	U	0.806		2.30	
GAF-440U	GAF-GW-440U-01172020	41-51	1/17/2020	N	D	4.79	J	32200		4790		< 0.101	U	0.784	J	9.98							
GAF-440U	GAF-GW-440U-01172020		1/17/2020	N	T	4.82	J	30400		5670		< 0.101	U	0.827	J	10.4		< 0.0650	U	< 0.531	U*	0.344	
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	D	< 6.91	U*	27100		5760		< 0.130	U	< 0.610	U	5.96							
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	T	< 6.91	U*	29600		6230		< 0.130	U	< 0.610	U	6.87		< 0.0650	U	< 0.816	U*	< 0.160	U*
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	D	3.39	J	30600		6330		< 0.130	U	< 0.610	U	7.31							
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	T	< 3.39	U	30000		6370		< 0.130	U	< 0.610	U	6.72		< 0.0650	U	< 0.519	U*	< 0.114	U
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	D	< 3.39	U	29400		6490		< 0.130	U	0.623	J	6.64							
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	T	< 3.39	U	27600		6510		< 0.130	U	0.624	J	6.25		< 0.0650	U	< 0.260	U	0.273	J
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	D	< 3.39	U	29200		6160		< 0.130	U	< 0.610	U	5.52							
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	T	< 3.39	U	28700		6280		< 0.130	U	< 0.610	U	5.35		< 0.0650	U	0.403	J	< 0.114	U

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					Parameter	Phosphorus		Potassium		Radium-226		Radium 228		Radium 226 + Radium 228		Selenium		Silicon		Silver		Sodium	
					Unit	mg/L		µg/L		pCi/L		pCi/L		pCi/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
26	GAF-GW-26-01142020	93-103	1/14/2020	N	D			9670		-0.103	U	0.479	U*	0.479	U*	< 1.51	U			< 0.177	U	8690	
26	GAF-GW-26-01142020		1/14/2020	N	T			9540		0.168		0.217	U	0.385	J	< 1.51	U			< 0.177	U	8040	
26	GAF-GW-903A-01142020		1/14/2020	FD	D			9300		0.00689	U	0.810	U*	0.817	U*	< 1.51	U			< 0.177	U	8020	
26	GAF-GW-903A-01142020		1/14/2020	FD	T			9350		0.329		0.477	U	0.806	J	< 1.51	U			< 0.177	U	7710	
26	GAF-GW-26-04222020		4/22/2020	N	D			9540		0.0324	U	0.342	UJ	0.375	UJ	< 1.51	U			< 0.177	U	6640	
26	GAF-GW-26-04222020		4/22/2020	N	T			9470		0.0493	U	0.176	U	0.225	U	< 1.51	U			< 0.177	U	6710	
26	GAF-GW-26-07142020		7/14/2020	N	T																		
26	GAF-GW-26-07242020		7/24/2020	N	D			9980		0.183		1.14	U*	1.32	J	< 1.51	U			< 0.177	U	9630	
26	GAF-GW-26-07242020		7/24/2020	N	T			10000		0.0663	U	0.495	U	0.562	U	< 1.51	U			< 0.177	U	9400	
26	GAF-GW-903-07242020		7/24/2020	FD	D			9800		0.0890	U	1.36	U*	1.45	U*	< 1.51	U			< 0.177	U	9040	
26	GAF-GW-903-07242020		7/24/2020	FD	T			10100		0.000	U	0.763		0.763	J	< 1.51	U			< 0.177	U	9510	
26	GAF-GW-26-10212020		10/21/2020	N	D			8630		0.102	U	0.318	U	0.420	U	< 1.51	U			< 0.177	U	7720	
26	GAF-GW-26-10212020		10/21/2020	N	T			9550		0.354	U*	0.258	U	0.612	U*	< 1.51	U			< 0.177	U	8090	
27	GAF-GW-27-01142020	77-87	1/14/2020	N	T			13200		0.405		0.506		0.910		< 1.51	U			< 0.177	U	14400	
27	GAF-GW-27-04222020		4/22/2020	N	D			12900		0.372		0.244	UJ	0.615	J	< 1.51	U			< 0.177	U	14000	
27	GAF-GW-27-04222020		4/22/2020	N	T			12800		0.363		0.387	U	0.750	J	< 1.51	U			< 0.177	U	13800	
27	GAF-GW-27-07152020		7/15/2020	N	T			11800		0.327		0.322	U	0.649	J	< 1.51	U			< 0.177	U	12400	
27	GAF-GW-27-10212020		10/21/2020	N	T			12400		0.270	U*	0.110	U	0.380	U*	< 1.51	U			< 0.177	U	13000	
GAF-439U	GAF-GW-439U-01212020	29.5-39.5	1/21/2020	N	D			2240		0.0941	U	0.280	U	0.374	U	< 1.51	U	5350		< 0.177	U	91600	
GAF-439U	GAF-GW-439U-01212020		1/21/2020	N	T	0.354		2490		0.165	U	0.638	U*	0.803	U*	< 1.51	U	7530		< 0.177	U	91000	
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	D			2570		0.0812	U	0.109	UJ	0.190	UJ	< 1.51	U	6070		< 0.177	U	107000	
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	T	0.809		2660		0.448		0.698	U	1.15	J	< 1.51	U	7520		< 0.177	U	104000	
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	D			2530		0.0399	U	0.234	U	0.274	U	< 1.51	U	6070		< 0.177	U	110000	
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	T	0.548		2690		0.218	U	0.125	U	0.344	U	< 1.51	U	8150		< 0.177	U	108000	
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	D			2550		0.256		0.345	U	0.601	J	< 1.51	U	6140		< 0.177	U	109000	
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	T	0.224		2760		0.180	U	0.285	U	0.465	U	< 1.51	U	8570		< 0.177	U	107000	
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	D			2500		0.0752	U	0.372	U	0.447	U	< 1.51	U	6240		< 0.177	U	101000	
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	T	0.655		3120		0.316	U	1.49	U*	1.80	U*	< 1.51	U	12900		< 0.177	U	100000	
GAF-440U	GAF-GW-440U-01172020	41-51	1/17/2020	N	D			3450		-0.00121	U	0.654	U*	0.654	U*	< 1.51	U	9950		< 0.177	U	80000	
GAF-440U	GAF-GW-440U-01172020		1/17/2020	N	T	< 0.102	U*	4760		0.111	U	0.433	U	0.544	U	< 1.51	U	9980		< 0.177	U	84500	
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	D			4670		0.101	U	0.201	U	0.302	U	< 1.51	U	4800		< 0.177	U	86300	
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	T	0.190		5150		0.122	U	0.579		0.701	J	< 1.51	U	5700		< 0.177	U	93200	
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	D			3980		0.0258	U	0.573	U*	0.599	U*	< 1.51	U	6160		< 0.177	U	93300	
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	T	0.0966	J	4280		0.148	U	0.453	U*	0.601	U*	< 1.51	U	6150		< 0.177	U	93200	
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	D			4150		0.179	U	0.130	U	0.309	U	< 1.51	U	5940		< 0.177	U	89000	
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	T	< 0.0320	U	4740		0.308	U	0.530	U	0.838	U	< 1.51	U	6210		< 0.177	U	87300	
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	D			4760		0.174		0.314	U	0.487	J	< 1.51	U	5450		< 0.177	U	92200	
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	T	< 0.0320	U	4990		0.167	U	0.403	U	0.570	U	< 1.51	U	5370		< 0.177	U	95200	

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					Parameter	Strontium		Sulfate		Sulfide		Thallium		Total Dissolved Solids		Total Organic Carbon		Total Suspended Solids		Vanadium		Zinc	
					Unit	µg/L		mg/L		mg/L		µg/L		mg/L		mg/L		mg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
26	GAF-GW-26-01142020	93-103	1/14/2020	N	D							0.679	J							1.16		17.8	J
26	GAF-GW-26-01142020		1/14/2020	N	T			708				< 0.814	U*	1130				57.7	J	1.81		15.9	
26	GAF-GW-903A-01142020		1/14/2020	FD	D							< 0.148	U							< 0.991	U	< 3.22	UJ
26	GAF-GW-903A-01142020		1/14/2020	FD	T			744				< 0.148	U	1170				35.6	J	2.50		11.5	
26	GAF-GW-26-04222020		4/22/2020	N	D							< 0.148	U							< 0.991	U	< 3.22	U
26	GAF-GW-26-04222020		4/22/2020	N	T			532	J			< 0.148	U	1020				35.4		< 0.991	U	< 15.6	U*
26	GAF-GW-26-07142020		7/14/2020	N	T																		
26	GAF-GW-26-07242020		7/24/2020	N	D							< 0.183	U*							< 0.991	U	< 3.22	U
26	GAF-GW-26-07242020		7/24/2020	N	T			742				< 0.148	U	1350				49.4		1.64		10.6	
26	GAF-GW-903-07242020		7/24/2020	FD	D							< 0.148	U							< 0.991	U	< 3.22	U
26	GAF-GW-903-07242020		7/24/2020	FD	T			743				< 0.148	U	1330				51.1		1.58		11.3	
26	GAF-GW-26-10212020		10/21/2020	N	D							< 0.216	U*							< 0.991	U	< 3.22	U
26	GAF-GW-26-10212020		10/21/2020	N	T			627				< 0.148	U	1050				25.0		< 0.991	U	3.95	J
27	GAF-GW-27-01142020	77-87	1/14/2020	N	T			1010				< 0.148	U	1730				1.00		< 0.991	U	< 3.22	U
27	GAF-GW-27-04222020		4/22/2020	N	D							< 0.148	U							< 0.991	U	< 3.22	U
27	GAF-GW-27-04222020		4/22/2020	N	T			909	J			< 0.148	U	1730				< 0.500	U	< 0.991	U	< 3.22	U
27	GAF-GW-27-07152020		7/15/2020	N	T			906				< 0.148	U	1740				0.500		< 0.991	U	< 3.22	U
27	GAF-GW-27-10212020		10/21/2020	N	T			1000				< 0.148	U	1660				< 0.500	U	< 0.991	U	< 3.22	U
GAF-439U	GAF-GW-439U-01212020	29.5-39.5	1/21/2020	N	D	539						< 0.148	U							< 0.991	U	17.7	J
GAF-439U	GAF-GW-439U-01212020		1/21/2020	N	T	542		619		< 1.34	U	< 0.171	U*	1440		2.78		85.8		4.68		7.48	J
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	D	526						< 0.148	U							< 0.991	U	< 3.22	U
GAF-439U	GAF-GW-439U-04222020		4/22/2020	N	T	550		546	J	< 1.34	U	0.386	J	1420		2.81		471		14.5		< 17.5	U*
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	D	541						< 0.148	U							< 0.991	U	< 3.22	U
GAF-439U	GAF-GW-439U-06192020		6/19/2020	N	T	544		597		< 1.34	U	< 0.307	U*	1350		2.86		245		10.8		12.9	
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	D	492						< 0.148	U							1.42		< 3.22	U
GAF-439U	GAF-GW-439U-08202020		8/20/2020	N	T	512		611		< 1.34	U	< 0.148	U	1390		< 3.02	U*	100		5.65		9.82	
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	D	532						< 0.404	U*							2.04		5.24	
GAF-439U	GAF-GW-439U-10192020		10/19/2020	N	T	551		545		< 1.34	U	0.518	J	1390		3.10		61.6		16.9		34.2	
GAF-440U	GAF-GW-440U-01172020	41-51	1/17/2020	N	D	561						< 0.148	U							3.52		36.0	J
GAF-440U	GAF-GW-440U-01172020		1/17/2020	N	T	584		507		< 1.34	U	< 0.165	U*	1460		3.24		62.8		4.05		16.6	J
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	D	551						< 0.148	U							< 0.991	U	< 7.77	U*
GAF-440U	GAF-GW-440U-04232020		4/23/2020	N	T	570		515		< 1.34	U	< 0.148	U	1360		3.17		23.9		< 0.991	U	< 8.44	U*
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	D	580						< 0.148	U							< 0.991	U	8.47	
GAF-440U	GAF-GW-440U-06182020		6/18/2020	N	T	571		502		< 1.34	U	< 0.148	U	1360		3.00		31.0		< 0.991	U	6.36	
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	D	591						< 0.178	U*							< 0.991	U	4.69	J
GAF-440U	GAF-GW-440U-08192020		8/19/2020	N	T	576		580		< 1.34	U	0.430	J	1420		3.14		26.6		< 0.991	U	6.58	
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	D	598						< 0.148	U							< 0.991	U	5.07	
GAF-440U	GAF-GW-440U-10202020		10/20/2020	N	T	575		563		6.19		< 0.148	U	1390		3.23		12.9		< 0.991	U	6.37	

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					Parameter	pH, Field	aerated pH	Dissolved Oxygen	ORP	Specific Conductance, Field	Temperature	Turbidity, field	Sulfide	Iron, Ferrous	Carbon Dioxide	Acidity		Alkalinity, Carbonate	
					Unit	pH units	pH units	mg/L	mV	umhos/cm	deg c	NTU	mg/L	mg/L	mg/L	mg/L		mg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Validator Qualifier	Result	Validator Qualifier
GAF-441U	GAF-GW-441U-01162020	40-50	1/16/2020	N	D														
GAF-441U	GAF-GW-441U-01162020		1/16/2020	N	T	3.50	3.62	0.44	230.1	5546	18.5	149		7	100	1110		< 5.00	U
GAF-441U	GAF-GW-441U-03172020		3/17/2020	N	T	3.57	3.49	0.45	266.9	6442	15.3	470	0	>7	100				
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	D														
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	T	3.29	3.29	0.39	286.1	7416	17.2	781	>10	6	80	1810		< 5.00	U
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	D														
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	T	3.25	3.27	0.14	326.8	7103	20.6	570	0	6	60	1230		< 5.00	U
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	D														
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	T	2.72	2.7	0.20	242.8	7124	21.0	240	0	5.5	>100	1840		< 5.00	U
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	D														
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	T	3.74	3.76	0.18	198.8	6717	21.6	154	0	5.5	70	1010		< 5.00	U
GAF-442U	GAF-GW-442U-01172020	59-69	1/17/2020	N	D														
GAF-442U	GAF-GW-442U-01172020		1/17/2020	N	T	6.52	6.57	0.47	-6.2	1730	14.8	111		3	6.25	8.09		< 5.00	U
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	D														
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	T	6.29	6.29	0.41	-116.1	2528	18.3	25.0	7	3	6.25	< 5.00	UR	< 5.00	U
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	D														
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	T	6.30	6.21	0.34	-69.3	2487	18.5	23.6	0	7	70	< 5.00	U	< 5.00	U
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	D														
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	T	6.86	6.86	0.37	-33.1	2444	21.5	72.6	0	4	60	-21.8		< 5.00	U
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	D														
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	T	6.33	6.4	0.29	-7.5	2342	19.2	53.9	0	5	56.0	-13.5		< 5.00	U
GAF-444U	GAF-GW-444U-01202020	50-60	1/20/2020	N	D														
GAF-444U	GAF-GW-444U-01202020		1/20/2020	N	T	4.13	4.13	0.43	292.6	1917	15.1	9.97		3	25	298		< 5.00	U
GAF-444U	GAF-GW-444U-02132020		2/13/2020	N	T	3.94		0.74	230.3	2261	14.2	10.6	>2	5.5	100				
GAF-444U	GAF-GW-444U-03172020		3/17/2020	N	T	3.86	3.81	7.37	259.2	2405	16.4	224	1	>7	25				
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	D														
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	T	4.30	4.3	0.33	217.3	2610	17.5	23.7	3	3	30	406		< 5.00	U
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	D														
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	T	4.47	4.51	0.30	190.2	2792	19.0	10.2	0	5.5	>100	364		< 5.00	U
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	D														
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	T	6.53	6.52	0.32	224.9	2807	18.8	34.1	0	3	>100	369		< 5.00	U
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	D														
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	T	4.17	4.2	2.64	222.1	2999	23.4	55.6	0	6	40	369		< 5.00	U
GAF-447U	GAF-GW-447U-01212020	8.6-13.6	1/21/2020	N	D														
GAF-447U	GAF-GW-447U-01212020		1/21/2020	N	T	6.53	6.62	0.99	70.0	1655	11.4	137		5	5	-103		< 5.00	U
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	D														
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	T	6.35	6.39	0.63	31.3	2570	13.9	206	5	8	6.0	-135		< 5.00	U
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	D														
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	T	6.45		0.35	35.3	2567	16.2	67.7	0	5.8	>100	-43.7		< 5.00	U
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	D														
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	T	6.71	6.70	0.60	10.2	2372	21.1	103	0	5	>100	-72.1		< 5.00	U
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	D														
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	T	6.35	6.35	1.65	103.9	2476	18.6	38.40	0	5	>100	-62.3		< 5.00	U

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					Parameter	Alkalinity, Hydroxide as		Alkalinity, Total as CaCO3		Alkalinity,Bicarbonate (CaCO3)		Aluminum		Antimony		Arsenic		Barium		Beryllium		Boron	
					Unit	mg/L		mg/L		mg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-441U	GAF-GW-441U-01162020	40-50	1/16/2020	N	D							122000		< 0.905	U*	3.36		9.84	J	18.6		2960	J
GAF-441U	GAF-GW-441U-01162020		1/16/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	129000		< 2.57	U*	5.40		22.7		19.2		2970	J
GAF-441U	GAF-GW-441U-03172020		3/17/2020	N	T																		
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	D							97100		< 1.89	U	19.5		11.5	J	17.2		2800	
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	106000		< 1.89	U	19.8		19.3	J	16.8		2930	
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	D							106000		< 1.89	U	16.1		14.5	J	14.8		2740	
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	109000		< 1.89	U	14.8		9.82	J	14.2		2520	
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	D							95400		< 0.378	U	13.2		< 16.0	U	12.4		2800	
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	101000		2.45		16.1		37.7	J	13.0		2850	
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	D							82500		< 0.756	U	16.5		11.5	J	13.1		< 2950	U*
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	85700		2.39	J	17.6		19.4	J	12.7		< 2940	U*
GAF-442U	GAF-GW-442U-01172020	59-69	1/17/2020	N	D							26.8	J	0.796	J	3.39		25.3		< 0.182	U	10800	
GAF-442U	GAF-GW-442U-01172020		1/17/2020	N	T	< 5.00	U	41.2		41.2		754	J	7.45		3.38		28.4		< 0.399	U*	10900	
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	D							15.8	J	0.892	J	3.49		23.2		< 0.182	U	10900	
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	T	< 5.00	U	35.1		35.1		218		1.69	J	3.99		23.7		< 0.182	U	11300	
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	D							< 12.5	U	0.645	J	4.21		23.4		< 0.182	U	10800	
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	T	< 5.00	U	36.9		36.9		119		6.07		3.85		26.6		< 0.199	U*	11400	
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	D							47.2		0.653	J	2.99		23.7		< 0.182	U	12800	
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	T	< 5.00	U	48.7		48.7		395		2.09		3.74		26.9		< 0.182	U	12500	
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	D							112		0.779	J	4.11		24.1		< 0.182	U	11600	J
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	T	< 5.00	U	47.6		47.6		502		3.70		3.92		25.8		< 0.182	U	10900	
GAF-444U	GAF-GW-444U-01202020	50-60	1/20/2020	N	D							11000		0.554	J	3.60		16.2		11.7		3740	
GAF-444U	GAF-GW-444U-01202020		1/20/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	11400		1.57	J	4.21		19.4		12.8		3740	
GAF-444U	GAF-GW-444U-02132020		2/13/2020	N	T																		
GAF-444U	GAF-GW-444U-03172020		3/17/2020	N	T																		
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	D							13300	J	0.478	J	7.50	J	17.3		9.20		4080	
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	11400	J	0.919	J	6.56	J	17.7		8.77		4250	
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	D							9660		0.610	J	6.27		< 15.3	U*	7.58		4230	
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	9610		0.692	J	5.67		15.1		7.96		4000	J
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	D							10900		< 0.378	U	5.12		18.1		7.36		4590	
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	11600		0.989	J	5.16		19.1		7.24		4500	
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	D							10900		< 0.378	U	7.72		17.1		8.44		4520	J
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	12400		0.717	J	8.14		20.2		8.42		< 4320	U*
GAF-447U	GAF-GW-447U-01212020	8.6-13.6	1/21/2020	N	D							< 12.5	U	0.694	J	< 0.313	U	17.1		< 0.182	U	2140	
GAF-447U	GAF-GW-447U-01212020		1/21/2020	N	T	< 5.00	U	195		195		25.3	J	1.29	J	< 0.492	U*	16.3		< 0.182	U	2090	
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	D							< 15.3	U*	< 1.02	U*	< 0.415	U*	13.6		< 0.182	U	1890	
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	T	< 5.00	U	176		176		< 67.1	U*	< 1.93	U*	< 0.949	U*	15.6		< 0.182	U	1910	
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	D							< 24.2	U*	< 0.378	U	0.560	J	15.6		< 0.182	U	1330	
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	T	< 5.00	U	157		157		36.1		< 0.378	U	0.602	J	16.3		< 0.182	U	1230	
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	D							< 12.5	U	0.436	J	0.376	J	19.0		< 0.182	U	1710	
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	T	< 5.00	U	174		174		< 12.5	U	< 0.378	U	0.379	J	17.6		< 0.182	U	1700	
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	D							36.4		< 0.378	U	0.555	J	17.4		< 0.182	U	1810	
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	T	< 5.00	U	130		130		43.2		0.404	J	0.490	J	16.9		< 0.182	U	1690	

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					Parameter	Cadmium		Calcium		Chloride		Chromium		Cobalt		Copper		Fluoride		Iron		Lead	
					Unit	µg/L		µg/L		mg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-441U	GAF-GW-441U-01162020	40-50	1/16/2020	N	D	11.8	J	426000				1.67	J	956	J	14.7	J			2940000		1.35	
GAF-441U	GAF-GW-441U-01162020		1/16/2020	N	T	11.6		437000		45.5		4.63		1100		53.5		5840		3200000		3.85	
GAF-441U	GAF-GW-441U-03172020		3/17/2020	N	T																		
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	D	15.0		436000				< 7.65	U	1320		56.2				2660000		< 1.51	U*
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	T	15.7		457000		37.0		< 7.65	U	1350		69.9		5160		2810000		< 3.37	U*
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	D	19.9		473000	J			15.1		1680		54.0				2710000	J	2.43	J
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	T	19.1		457000		42.0		< 7.65	U	1680		46.1		4750		2810000		< 2.02	U*
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	D	13.9		433000				2.02		1420		24.6				2630000		1.17	
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	T	12.8		423000		37.9		6.86		1280		34.3		3920		2670000		5.59	
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	D	8.23		440000				< 3.06	U	862		16.7				2240000		0.820	J
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	T	7.56		441000		41.5		4.05		845		18.7		3860		2280000		2.37	
GAF-442U	GAF-GW-442U-01172020	59-69	1/17/2020	N	D	< 0.217	U	637000				< 1.53	U	10.7		< 0.627	U			4470		< 0.137	U*
GAF-442U	GAF-GW-442U-01172020		1/17/2020	N	T	< 0.217	U	620000		7.24		< 1.53	U	20.9		1.24	J	107		4840		< 1.02	U*
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	D	< 0.217	U	576000				< 1.53	U	14.6		0.632	J			6320		< 0.128	U
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	T	< 0.217	U	585000		6.13		< 1.53	U	16.1		< 0.627	U	78.8	J	6480		< 0.311	U*
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	D	< 0.217	U	568000				< 1.53	U	14.1		< 0.627	U			7160		< 0.128	U
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	T	< 0.217	U	616000		6.79		1.97	J	15.7		0.649	J	125	J	7220		0.294	J
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	D	< 0.217	U	614000				< 1.53	U	13.3		< 0.627	U			6760		< 0.128	U
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	T	< 0.217	U	626000		5.53		< 1.53	U	14.2		0.936	J	< 53.4	U*	7170		0.389	J
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	D	< 0.217	U	628000				< 1.53	U	14.5		< 0.627	U			6860		< 0.128	U
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	T	< 0.217	U	629000		5.49		1.69	J	15.1		1.63	J	78.7	J	7100		0.468	J
GAF-444U	GAF-GW-444U-01202020	50-60	1/20/2020	N	D	7.22		501000				< 1.91	U*	1430		< 0.809	U*			71300		2.52	
GAF-444U	GAF-GW-444U-01202020		1/20/2020	N	T	8.17		509000		6.33		1.60	J	1500		< 5.32	U*	732		68100		5.58	
GAF-444U	GAF-GW-444U-02132020		2/13/2020	N	T																		
GAF-444U	GAF-GW-444U-03172020		3/17/2020	N	T																		
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	D	9.79		507000				< 1.53	U	1430		4.54				122000		2.53	
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	T	9.29		516000		6.73		< 1.53	U	1400		< 5.08	U*	879		113000		< 2.23	U*
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	D	9.17		530000				< 1.53	U	1390		11.8	J			105000		2.14	
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	T	10.1		535000		7.01		< 1.53	U	1360		< 3.62	U*	1050		108000		< 2.15	U*
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	D	9.60		517000				< 1.53	U	1320		5.34				95300		2.11	
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	T	9.92		523000		6.38		1.53	J	1330		5.61		220	J	104000		2.26	
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	D	9.26		484000				< 1.53	U	1330		< 1.31	U*			88900		1.99	
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	T	9.40		464000		6.47		2.10		1280		4.44		810		91000		2.67	
GAF-447U	GAF-GW-447U-01212020	8.6-13.6	1/21/2020	N	D	< 0.217	U	601000				< 1.53	U	63.3		< 0.627	U			7770		< 0.141	U*
GAF-447U	GAF-GW-447U-01212020		1/21/2020	N	T	< 0.217	U	600000		2.92		< 1.53	U	64.7		< 0.627	U	56.9	J	14400		< 0.638	U*
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	D	< 0.217	U	555000				< 1.53	U	65.7		< 1.60	U*			1590		< 0.128	U
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	T	< 0.217	U	547000		3.08		< 1.53	U	66.1		< 1.58	U*	60.6	J	18100		< 0.475	U*
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	D	< 0.217	U	535000	J			< 1.53	U	89.0		< 1.91	U*			15500	J	< 0.128	U
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	T	< 0.217	U	539000		2.11		< 1.53	U	84.9		< 0.725	U*	35.9	J	15300		< 0.298	U*
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	D	< 0.217	U	554000				< 1.53	U	76.2		< 0.627	U			8480		< 0.128	U
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	T	< 0.217	U	553000		2.02		< 1.53	U	101		< 0.627	U	< 38.9	U*	14700		< 0.128	U
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	D	< 0.217	U	579000				< 1.53	U	73.1		1.07	J			6360	J	< 0.128	U
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	T	< 0.217	U	552000		1.38	J	< 1.53	U	66.2		1.33	J	< 110	UJ	4920	J	0.185	J

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					Parameter	Lithium		Magnesium		Manganese		Mercury		Molybdenum		Nickel		nitrate-nitrite nitrogen		Nitrogen, Kjeldahl, Total		Phosphate as PO4	
					Unit	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		mg/L		mg/L		mg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-441U	GAF-GW-441U-01162020	40-50	1/16/2020	N	D	16.4		139000		63600		< 0.101	U	< 0.610	U	705							
GAF-441U	GAF-GW-441U-01162020		1/16/2020	N	T	21.6		143000		77500		< 0.101	U	< 0.610	U	769		1.94		2.42		0.387	
GAF-441U	GAF-GW-441U-03172020		3/17/2020	N	T																		
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	D	< 17.0	U	126000		93700		< 0.130	U	< 3.05	U	771							
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	T	< 17.0	U	133000		90700		0.130	J	< 3.05	U	777		1.60		< 2.54	U*	2.66	J
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	D	< 17.0	U	135000	J	23500	J	< 0.130	U	< 3.05	U	887							
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	T	22.5	J	138000		107000		< 0.130	U	< 3.05	U	904		1.58		2.22		1.30	
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	D	< 33.9	U	124000		108000	J	< 0.130	U	< 0.610	U	762							
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	T	< 33.9	U	123000		93100	J	< 0.130	U	< 0.610	U	730		1.40		1.73		0.329	
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	D	13.4		123000		51400		< 0.130	U	< 1.22	U	612							
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	T	14.0		126000		49800		< 0.130	U	< 1.22	U	608		0.463		2.27		1.28	
GAF-442U	GAF-GW-442U-01172020	59-69	1/17/2020	N	D	< 3.39	U	22600		1530		< 0.101	U	39.8	J	1.42							
GAF-442U	GAF-GW-442U-01172020		1/17/2020	N	T	< 3.39	U	20700		2380		< 0.101	U	22.9	J	3.48		< 0.0650	U	< 1.78	U*	< 0.114	U
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	D	< 3.39	U	22500		1620		< 0.130	U	25.1		5.69	J						
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	T	< 3.39	U	22800		1630		< 0.130	U	25.2		1.79	J	< 0.0650	U	1.00		< 0.123	U*
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	D	< 3.39	U	21400		1570		< 0.130	U	31.4		1.39							
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	T	< 3.39	U	22400		2040		< 0.130	U	31.7		4.27		< 0.0650	U	1.42		< 0.114	U
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	D	< 3.39	U	22000		1580		< 0.130	U	28.4		1.50							
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	T	< 3.39	U	21900		1620		< 0.130	U	33.1		2.24		< 0.0650	U	0.772		0.364	
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	D	< 3.39	U	21800		1530		< 0.130	U	34.0		1.49							
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	T	< 3.39	U	22200		1560		< 0.130	U	35.4		3.34		< 0.0650	U	1.13		< 0.114	U
GAF-444U	GAF-GW-444U-01202020	50-60	1/20/2020	N	D	35.9		54000		112000		< 0.101	U	< 0.610	U	643							
GAF-444U	GAF-GW-444U-01202020		1/20/2020	N	T	37.4		54800		111000		< 0.101	U	< 0.610	U	660		< 0.0650	U	1.22	J	< 0.114	U
GAF-444U	GAF-GW-444U-02132020		2/13/2020	N	T																		
GAF-444U	GAF-GW-444U-03172020		3/17/2020	N	T																		
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	D	30.7		48300		82900		< 0.130	U	< 0.610	U	520							
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	T	31.2		51100		91800		< 0.130	U	< 0.610	U	527		< 0.0650	U	< 1.50	U*	< 0.155	U*
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	D	31.5		51000		98000		< 0.130	U	< 0.610	U	552							
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	T	31.2		51500		101000		< 0.130	U	< 0.610	U	534		< 0.0650	U	< 1.13	U*	< 0.114	U
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	D	31.6		51200		86800		< 0.130	U	< 0.610	U	522							
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	T	30.2		49800		89700		< 0.130	U	< 0.610	U	508		< 0.0650	U	0.341	J	< 0.114	U
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	D	31.2		50400		93700		< 0.130	U	< 0.610	U	536							
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	T	31.3		47800		87100		< 0.130	U	< 0.610	U	511		< 0.0650	U	0.890		< 0.114	U
GAF-447U	GAF-GW-447U-01212020	8.6-13.6	1/21/2020	N	D	< 3.39	U	54200		39600		< 0.101	U	< 0.610	U	8.10							
GAF-447U	GAF-GW-447U-01212020		1/21/2020	N	T	< 3.39	U	54400		39800		< 0.101	U	< 0.610	U	8.26		< 0.0650	U	0.618		< 0.114	U
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	D	< 6.57	U*	48300		31000		< 0.130	U	< 0.610	U	7.26							
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	T	< 5.18	U*	47300		31100		< 0.130	U	< 0.610	U	7.51		< 0.0650	U	< 1.07	U*	< 0.114	U
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	D	< 3.39	U	38700	J	32400	J	< 0.130	U	< 0.610	U	9.43							
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	T	< 3.39	U	36700		26000	J	< 0.130	U	< 0.610	U	10.2		< 0.0650	U	< 0.753	U*	< 0.114	U
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	D	< 3.39	U	41600		28200		< 0.130	U	< 0.610	U	11.9	J						
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	T	< 3.39	U	42700		31200		< 0.130	U	< 0.610	U	10.2	J	< 0.0650	U	0.808		< 0.114	U
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	D	< 3.39	U	41800	J	32900	J	< 0.130	UJ	< 0.610	U	10.4							
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	T	< 3.39	U	36400	J	28200	J	< 0.130	UJ	< 0.610	U	11.3		0.0920	J	0.592		< 0.114	U

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					Parameter	Phosphorus		Potassium		Radium-226		Radium 228		Radium 226 + Radium 228		Selenium		Silicon		Silver		Sodium	
					Unit	mg/L		µg/L		pCi/L		pCi/L		pCi/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-441U	GAF-GW-441U-01162020	40-50	1/16/2020	N	D			18400		0.687		1.12	U*	1.81	J	5.44		10400		< 0.177	U	97200	
GAF-441U	GAF-GW-441U-01162020		1/16/2020	N	T	0.211		19500		0.738		1.30		2.03		7.15		20800		< 0.177	U	97500	
GAF-441U	GAF-GW-441U-03172020		3/17/2020	N	T																		
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	D			16100		0.211	U	0.605	J	0.816	J	< 7.55	U	10200		< 0.885	U	84800	
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	T	0.554		16900		0.594		0.811	U	1.41	J	< 7.55	U	14900		< 0.885	U	89900	
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	D			16000	J	0.742	U	2.09		2.84	J	< 7.55	U	13500	J	< 0.885	U	94300	J
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	T	0.427		16100		0.196	U	1.39	U	1.59	U	< 7.55	U	12500		< 0.885	U	90600	
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	D			14500		0.240	U	0.785		1.03	J	4.13	J	11500		< 0.177	U	76300	
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	T	0.212		15200		0.532	U	0.919	U	1.45	U	4.30	J	19300		< 0.177	U	78400	
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	D			14400		0.193	UJ	0.405	UJ	0.598	UJ	< 3.02	U	9470		< 0.354	U	89100	
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	T	0.326		15200		0.429	UJ	1.12	J	1.55	J	< 3.02	U	12500		< 0.354	U	90200	
GAF-442U	GAF-GW-442U-01172020	59-69	1/17/2020	N	D			42100		0.447		1.48		1.93		< 1.51	U	1470		< 0.177	U	24100	
GAF-442U	GAF-GW-442U-01172020		1/17/2020	N	T	< 0.0320	U	39900		0.432		0.963		1.39		< 1.51	U	2580		< 0.177	U	25200	
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	D			42700		0.298		0.560	J	0.859	J	< 1.51	U	1740		< 0.177	U	24500	
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	T	< 0.0320	U	43200		0.279		0.777		1.06		< 1.51	U	1810		< 0.177	U	24100	
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	D			42600		0.493		1.01	U*	1.50	J	< 1.51	U	1760		< 0.177	U	24200	
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	T	0.0348	J	44400		0.354		0.788		1.14		< 1.51	U	2050		< 0.177	U	26100	
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	D			42200		0.615		1.00	U*	1.62	J	< 1.51	U	1790		< 0.177	U	23100	
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	T	< 0.0320	U	42700		0.535		1.08		1.62		< 1.51	U	2160		< 0.177	U	23000	
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	D			42400		0.360		0.739		1.10		< 1.51	U	1730		< 0.177	U	22000	
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	T	< 0.0320	U	42800		0.159	U	0.260	U	0.419	U	< 1.51	U	2080		< 0.177	U	21500	
GAF-444U	GAF-GW-444U-01202020	50-60	1/20/2020	N	D			9630		-0.00421	U	-0.197	U	0.000	U	1.52	J	8760		< 0.177	U	52500	
GAF-444U	GAF-GW-444U-01202020		1/20/2020	N	T	< 0.0320	U	9970		0.0958	U	0.311	U	0.406	U	1.86	J	8900		< 0.177	U	53100	
GAF-444U	GAF-GW-444U-02132020		2/13/2020	N	T																		
GAF-444U	GAF-GW-444U-03172020		3/17/2020	N	T																		
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	D			12300		0.0754	U	0.109	UJ	0.184	UJ	< 1.51	U	9120		< 0.177	U	58400	
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	T	0.0994	J	12100		0.145		0.322	U	0.467	J	< 1.51	U	9070		< 0.177	U	68100	
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	D			11900								< 1.51	U	9290		< 0.177	U	65300	
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	T	< 0.0320	U	11800								< 1.51	U	9350		< 0.177	U	67600	
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	D			12300		0.147	U	0.338	U	0.484	U	1.79	J	8900		< 0.177	U	75200	
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	T	< 0.0320	U	12500		0.221		0.524		0.745		1.92	J	9290		< 0.177	U	69400	
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	D			11500		0.157	UJ	0.488	J	0.646	J	< 1.51	U	8170		< 0.177	U	71800	
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	T	0.0674	J	11400		0.224	UJ	0.489	J	0.713	J	< 1.51	U	9010		< 0.177	U	65500	
GAF-447U	GAF-GW-447U-01212020	8.6-13.6	1/21/2020	N	D			2150		0.0848	U	0.0975	U	0.182	U	< 1.51	U	7860		< 0.177	U	51100	
GAF-447U	GAF-GW-447U-01212020		1/21/2020	N	T	< 0.0320	U	2190		0.0294	U	0.691	U*	0.720	U*	< 1.51	U	8400		< 0.177	U	51300	
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	D			2270		0.0427	U	0.00716	U	0.0499	U	< 1.51	U	7580		< 0.177	U	44500	
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	T	0.0679	J	2180		0.0723	U	0.313	U	0.385	U	< 1.51	U	8340		< 0.177	U	43300	
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	D			2450	J	0.242	U	0.402	U	0.645	U	< 1.51	U	8730	J	< 0.177	U	32000	J
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	T	< 0.0446	U*	2880		0.101	U	1.25		1.35	J	< 1.51	U	8940		< 0.177	U	32600	
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	D			2750		0.108	U	0.570		0.678	J	< 1.51	U	9130		< 0.177	U	33200	
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	T	< 0.0320	U	2570		0.135	U	0.641		0.776	J	< 1.51	U	8430		< 0.177	U	32600	
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	D			2700		0.0914	U	0.0551	U	0.147	U	< 1.51	U	8720		< 0.177	U	33600	
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	T	< 0.0320	U	2980		0.0874	U	0.112	U	0.199	U	< 1.51	U	8380		< 0.177	U	30500	

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					Parameter	Strontium		Sulfate		Sulfide		Thallium		Total Dissolved Solids		Total Organic Carbon		Total Suspended Solids		Vanadium		Zinc	
					Unit	µg/L		mg/L		mg/L		µg/L		mg/L		mg/L		mg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-441U	GAF-GW-441U-01162020	40-50	1/16/2020	N	D	1000						3.69								32.3		2760	
GAF-441U	GAF-GW-441U-01162020		1/16/2020	N	T	1020		8440		45.3		3.87		11100		4.80		97.0		42.3		2930	
GAF-441U	GAF-GW-441U-03172020		3/17/2020	N	T																		
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	D	879						< 4.83	U*							28.3		2680	
GAF-441U	GAF-GW-441U-04242020		4/24/2020	N	T	964		7300		28.7		< 3.70	U*	5500		4.64		486		37.1		2730	
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	D	996	J					< 3.89	U*							34.7		2880	
GAF-441U	GAF-GW-441U-06172020		6/17/2020	N	T	940		7060		17.1	J	4.15	J	5360		4.55		306		34.3		2820	
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	D	842						3.29								27.2		2630	
GAF-441U	GAF-GW-441U-08182020		8/18/2020	N	T	869		7560		23.1		3.54		5290		5.09		152		37.5		2580	
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	D	981						3.47								24.7		2290	
GAF-441U	GAF-GW-441U-10222020		10/22/2020	N	T	982		6640		< 23.7	U*	3.44		5550	J	4.42		148		29.5		2280	
GAF-442U	GAF-GW-442U-01172020	59-69	1/17/2020	N	D	2040						< 0.148	U							< 0.991	U	19.7	
GAF-442U	GAF-GW-442U-01172020		1/17/2020	N	T	1930		1230		< 1.34	U	< 0.378	U*	2530		3.84		14.8		1.67		16.7	
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	D	2050						< 0.148	U							< 0.991	U	< 16.7	U*
GAF-442U	GAF-GW-442U-04222020		4/22/2020	N	T	2050		1520	J	< 1.34	U	< 0.148	U	1830		2.10		14.6		< 0.991	U	< 9.38	U*
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	D	2150						0.254	J							< 0.991	U	7.95	
GAF-442U	GAF-GW-442U-06182020		6/18/2020	N	T	2200		1670		1.77	J	< 0.367	U*	1850		4.79		6.50		< 0.991	U	18.5	
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	D	2310						< 0.148	U							< 0.991	U	< 3.22	U
GAF-442U	GAF-GW-442U-08192020		8/19/2020	N	T	2350		1750		< 1.34	U	0.196	J	1820		1.90		13.5		< 0.991	U	5.29	
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	D	2260						< 0.148	U							< 0.991	U	3.43	J
GAF-442U	GAF-GW-442U-10202020		10/20/2020	N	T	2290		1830		< 1.34	U	0.293	J	2290		2.01		20.6		1.23		8.40	
GAF-444U	GAF-GW-444U-01202020	50-60	1/20/2020	N	D	922						< 0.460	U*							< 0.991	U	677	
GAF-444U	GAF-GW-444U-01202020		1/20/2020	N	T	936		1570		< 6.70	U	< 0.587	U*	2820		5.31		1.40		< 0.991	U	724	
GAF-444U	GAF-GW-444U-02132020		2/13/2020	N	T																		
GAF-444U	GAF-GW-444U-03172020		3/17/2020	N	T																		
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	D	1230						< 0.893	U*							< 0.991	U	788	J
GAF-444U	GAF-GW-444U-04242020		4/24/2020	N	T	1500		1940		< 1.34	U	< 0.510	U*	2060		4.26		< 13.2	U*	< 0.991	U	699	J
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	D	1430						< 0.997	U*							< 0.991	U	677	
GAF-444U	GAF-GW-444U-06162020		6/16/2020	N	T	1440	J	1870		< 6.70	U	< 0.544	U*	2060		6.51		7.00		< 0.991	U	649	
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	D	1510						< 0.429	U*							< 0.991	U	718	
GAF-444U	GAF-GW-444U-08192020		8/19/2020	N	T	1460		2220		< 13.4	U	0.454	J	2080		2.77		10.0		< 0.991	U	734	
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	D	1440						0.506	J							< 0.991	U	720	
GAF-444U	GAF-GW-444U-10222020		10/22/2020	N	T	1350		2010		< 13.4	U	0.490	J	2800		2.39		4.10		2.31		713	
GAF-447U	GAF-GW-447U-01212020	8.6-13.6	1/21/2020	N	D	973						< 0.156	U*							< 0.991	U	5.44	
GAF-447U	GAF-GW-447U-01212020		1/21/2020	N	T	989		1300		< 1.34	U	< 0.193	U*	2560		3.79		7.90		< 0.991	U	5.88	
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	D	850						< 0.191	U*							< 0.991	U	< 7.70	U*
GAF-447U	GAF-GW-447U-04232020		4/23/2020	N	T	848		1390		< 1.34	U	< 0.171	U*	1810		2.91		8.00		< 0.991	U	< 8.99	U*
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	D	1000	J					< 0.240	U*							< 0.991	U	8.15	
GAF-447U	GAF-GW-447U-06172020		6/17/2020	N	T	1080		1460		< 1.34	UJ	< 0.291	U*	1660		2.81		2.80		< 0.991	U	< 10.9	U*
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	D	946						< 0.148	U							< 0.991	U	10.1	
GAF-447U	GAF-GW-447U-08182020		8/18/2020	N	T	917		1490		< 6.70	U	< 0.148	U	1770		2.46		3.70		< 0.991	U	6.54	
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	D	1090						< 0.163	U*							< 0.991	U	8.26	
GAF-447U	GAF-GW-447U-10192020		10/19/2020	N	T	1210		1470		< 13.4	U	0.194	J	1130		2.12		2.00		< 0.991	U	8.66	

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					Parameter	pH, Field	aerated pH	Dissolved Oxygen	ORP	Specific Conductance, Field	Temperature	Turbidity, field	Sulfide	Iron, Ferrous	Carbon Dioxide	Acidity		Alkalinity, Carbonate	
					Unit	pH units	pH units	mg/L	mV	umhos/cm	deg c	NTU	mg/L	mg/L	mg/L	mg/L		mg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Validator Qualifier	Result	Validator Qualifier
GAF-448U	GAF-GW-448U-01202020	35-50	1/20/2020	N	D														
GAF-448U	GAF-GW-448U-01202020		1/20/2020	N	T	6.93	6.93	0.33	-123.9	1025	15.1	48.5		5	25	-435		< 5.00	U
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	D														
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	T	6.52	6.52	0.11	-124.7	1600	16.8	65.3	10	6	20	-479		< 5.00	U
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	D														
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	T	6.81		1.43	-61.6	1419	20.5	37.9	0	3	>100	-334		< 5.00	U
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	D														
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	T	6.13	6.04	0.37	-120.2	1446	20.8	328	0	6	>100	-329		< 5.00	U
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	D														
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	T	6.62	6.6	0.44	-88.1	1461	19.9	388	0	5.5	100	-485		< 5.00	U
GAF-489U	GAF-GW-489U-01212020	44-54	1/21/2020	N	D														
GAF-489U	GAF-GW-489U-01212020		1/21/2020	N	T	6.11	6.21	1.96	171.5	48.7	13.2	17.8		0	6.25	-27.3		< 5.00	U
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	D														
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	T	5.75	5.75	3.87	175.5	66.5	15.1	28.6	8	2.5	6.5	-93.5		< 5.00	U
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	D														
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	T	5.56	5.61	4.66	219.6	64.2	16.7	43.6	0	6.0	30	< 5.00	U	< 5.00	U
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	D														
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	T	5.53	5.5	1.86	212.5	77.8	17.4	13.3	0	0	35	39.3		< 5.00	U
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	D														
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	T	5.80	15.20	3.79	162.1	84.2	16.4	68.7	0	0	50	-7.88		< 5.00	U
GAF-526U	GAF-GW-526U-04232020	63-68	4/23/2020	N	D														
GAF-526U	GAF-GW-526U-04232020		4/23/2020	N	T	6.82	6.8	0.30	-65.0	1242	15.8	16.8	7.5	7	8	-140		< 5.00	U
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	D														
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	T	6.81		3.74	103.5	1431	18.4	4.78	0	0.7	70	-130		< 5.00	U
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	D														
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	T	6.78	6.8	0.28	-70.41	1487	19.8	4.66	0.2	1.0	60	-138		< 5.00	U
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	D														
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	T	7.14	7.14	0.63	-2.5	1527	17.7	2.22	0	0.5	30	-145		< 5.00	U
GAF-541U	GAF-GW-541U-04242020	58-63	4/24/2020	N	D														
GAF-541U	GAF-GW-541U-04242020		4/24/2020	N	T	6.04	6.04	0.33	-68.9	4032	18.3	54.5	>10	5.5	50	189		< 5.00	U
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	D														
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	T	6.12	6.12	0.31	-43.6	3765	19.0	17.9	0	7	54	39.1		< 5.00	U
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	D														
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	T	5.91	5.9	0.48	73.1	4110	21.8	8.37	0	3.3	>100	11.8		< 5.00	U
GAF-541U	GAF-GW-541U-10222020		10/22/2020	N	T	6.05	6.09	0.26	-57.8	4016	20.4	4.96	0	7	50	-37.5		< 5.00	U

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					Parameter	Alkalinity, Hydroxide as		Alkalinity, Total as CaCO3		Alkalinity,Bicarbonate (CaCO3)		Aluminum		Antimony		Arsenic		Barium		Beryllium		Boron	
					Unit	mg/L		mg/L		mg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-448U	GAF-GW-448U-01202020	35-50	1/20/2020	N	D							13.1	J	0.828	J	26.7	J	349	J	< 0.182	U	< 98.3	U*
GAF-448U	GAF-GW-448U-01202020		1/20/2020	N	T	< 5.00	U	443		443		243		2.15		17.6	J	274	J	< 0.664	U*	< 73.7	U*
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	D							< 23.1	U*	< 0.988	U*	30.8		342		< 0.182	U	< 38.6	U
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	T	< 5.00	U	433		433		380		< 1.09	U*	31.2		367		< 0.182	U	< 38.6	U
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	D							107	J	0.436	J	24.4	J	353		< 0.182	U	69.2	J
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	T	< 5.00	U	430		430		13.2	J	< 0.378	U	21.0	J	323		< 0.182	U	< 54.9	U*
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	D							188		< 0.378	U	26.6		368		< 0.182	U	< 38.6	U
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	T	< 5.00	U	492		492		377		0.494	J	30.7		380		< 0.182	U	< 38.6	U
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	D							214		< 0.378	U	29.0		332		< 0.182	U	< 38.6	U
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	T	< 5.00	U	523		523		546		0.603	J	30.7		361		< 0.182	U	< 47.5	U*
GAF-489U	GAF-GW-489U-01212020	44-54	1/21/2020	N	D							20.5	J	2.69		< 0.313	U	13.9		< 0.182	U	52.9	J
GAF-489U	GAF-GW-489U-01212020		1/21/2020	N	T	< 5.00	U	22.2		22.2		53.6		3.59		< 0.313	U	15.8		< 0.284	U*	59.1	J
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	D							< 12.5	U	< 1.13	U*	< 0.313	U	12.3		< 0.182	U	< 38.6	U
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	T	< 5.00	U	35.3		35.3		288		< 1.23	U*	< 0.313	U	13.6		< 0.182	U	< 38.6	U
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	D							38.4		0.861	J	< 0.313	U	15.7		< 0.182	U	< 62.5	U*
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	T	< 5.00	U	23.0		23.0		40.2		0.900	J	< 0.313	U	13.2		< 0.182	U	< 72.7	U*
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	D							25.7	J	0.453	J	< 0.313	U	11.6		< 0.182	U	< 38.6	U
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	T	< 5.00	U	48.9		48.9		381		0.826	J	< 0.313	U	14.5		< 0.182	U	< 38.6	U
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	D							28.5	J	< 0.378	U	< 0.313	U	13.7		< 0.182	U	< 75.1	U*
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	T	< 5.00	U	42.0		42.0		343		0.727	J	< 0.313	U	18.5		< 0.182	U	< 129	U*
GAF-526U	GAF-GW-526U-04232020	63-68	4/23/2020	N	D							< 18.7	U*	< 1.49	U*	< 1.08	U*	34.2		< 0.182	U	5280	
GAF-526U	GAF-GW-526U-04232020		4/23/2020	N	T	< 5.00	U	156		156		178		< 1.16	U*	< 1.33	U*	36.3		< 0.182	U	5360	
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	D							< 12.5	U	< 0.378	U	0.535	J	35.8		< 0.182	U	5140	
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	T	< 5.00	U	176		176		30.4		< 0.378	U	0.392	J	38.1		< 0.182	U	5420	
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	D							< 12.5	U	< 0.378	U	0.462	J	32.6		< 0.182	U	5260	
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	T	< 5.00	U	174		174		90.0		< 0.378	U	0.432	J	32.6		< 0.182	U	5180	
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	D							< 12.5	U	< 0.378	U	< 0.313	U	29.2		< 0.182	U	5540	
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	T	< 5.00	U	170		170		66.9		< 0.378	U	0.324	J	29.3		< 0.182	U	5490	
GAF-541U	GAF-GW-541U-04242020	58-63	4/24/2020	N	D							114		< 0.378	U	< 0.313	U	31.8		< 0.182	U	517	
GAF-541U	GAF-GW-541U-04242020		4/24/2020	N	T	< 5.00	U	261		261		243		< 0.378	U	0.410	J	31.4		< 0.182	U	< 524	U*
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	D							< 64.9	U*	< 0.378	U	0.626	J	30.0		< 0.182	U	534	
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	T	< 5.00	U	253		253		186		< 0.378	U	0.629	J	31.7		< 0.182	U	493	
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	D							< 12.5	U	< 0.378	U	0.569	J	24.3		< 0.182	U	533	
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	T	< 5.00	U	348		348		52.7		< 0.378	U	0.787	J	41.1		< 0.182	U	574	
GAF-541U	GAF-GW-541U-10222020		10/22/2020	N	T	< 5.00	U	333		333		148		< 0.378	U	0.755	J	22.8		< 0.182	U	< 1240	U*

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					Parameter	Cadmium		Calcium		Chloride		Chromium		Cobalt		Copper		Fluoride		Iron		Lead	
					Unit	µg/L		µg/L		mg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-448U	GAF-GW-448U-01202020	35-50	1/20/2020	N	D	< 0.217	U	254000	J			< 1.53	U	1.40		< 0.627	U			85600	J	< 0.160	U*
GAF-448U	GAF-GW-448U-01202020		1/20/2020	N	T	< 0.217	U	201000	J	11.8		< 1.53	U	3.02		< 0.912	U*	150		55000	J	< 0.521	U*
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	D	< 0.217	U	248000				< 1.53	U	< 1.57	U*	< 0.874	U*			85100		< 0.128	U
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	T	< 0.217	U	246000		13.7		2.04		1.80		< 1.53	U*	205		86500		< 0.581	U*
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	D	< 0.217	U	246000	J			< 1.53	U	2.10		< 2.08	U*			66600	J	0.325	J
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	T	< 0.217	U	241000		14.3		< 1.53	U	2.22		< 0.627	U	167		64700		< 0.128	U
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	D	< 0.217	U	275000	J			< 1.53	U	0.810		< 0.627	U			76900	J	0.173	J
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	T	< 0.217	U	247000	J	12.6		< 1.53	U	1.31		< 0.627	U	< 58.6	U*	68500	J	0.404	J
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	D	< 0.217	U	246000				< 1.53	U	0.933		< 0.627	U			63000		0.157	J
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	T	< 0.217	U	230000		12.7		1.84	J	1.22		0.807	J	176		58600		0.478	J
GAF-489U	GAF-GW-489U-01212020	44-54	1/21/2020	N	D	< 0.217	U	5190				< 1.53	U	0.230	J	< 0.937	U*			< 426	U*	< 0.154	U*
GAF-489U	GAF-GW-489U-01212020		1/21/2020	N	T	< 0.217	U	5230		0.989	J	< 1.53	U	0.255	J	< 1.36	U*	31.3	J	80.4		< 0.525	U*
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	D	< 0.217	U	10700	J			< 1.53	U	< 0.134	U	< 1.16	U*			< 19.5	U	< 0.128	U
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	T	< 0.217	U	7780	J	1.22		< 1.53	U	< 0.359	U*	< 1.12	U*	< 26.3	U	395		< 0.450	U*
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	D	< 0.217	U	5780				< 1.53	U	0.327	J	0.738	J			189	J	0.351	J
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	T	< 0.217	U	6320		1.31		< 1.53	U	0.346	J	< 0.627	U	37.4	J	< 82.9	U*	0.272	J
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	D	< 0.217	U	6980				< 1.53	U	< 0.134	U	< 0.627	U			< 19.5	U	< 0.128	U
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	T	< 0.217	U	7050		1.10		< 1.53	U	0.429	J	0.808	J	< 32.9	U*	535		0.502	J
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	D	< 0.217	U	9340				< 1.53	U	0.195	J	< 0.627	U			< 66.1	U*	< 0.128	U
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	T	< 0.217	U	9350		1.12		< 1.53	U	0.644		1.66	J	< 44.0	U	700		0.665	J
GAF-526U	GAF-GW-526U-04232020	63-68	4/23/2020	N	D	< 0.217	U	276000				< 1.53	U	3.53		< 1.38	U*			779		< 0.149	U*
GAF-526U	GAF-GW-526U-04232020		4/23/2020	N	T	< 0.217	U	282000		3.06		< 1.53	U	3.92		< 1.31	U*	81.2	J	1170		< 0.324	U*
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	D	< 0.217	U	309000				< 1.53	U	7.87		< 0.627	U			408		< 0.128	U
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	T	< 0.217	U	322000		3.57		< 1.53	U	8.25		< 0.627	U	92.1	J	513		< 0.128	U
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	D	< 0.217	U	329000				< 1.53	U	5.33		< 0.627	U			544		< 0.128	U
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	T	< 0.217	U	327000		3.76		< 1.53	U	5.82		0.695	J	< 46.2	U*	699		0.147	J
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	D	< 0.217	U	334000				< 1.53	U	2.53		< 0.627	U			326		< 0.128	U
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	T	< 0.217	U	329000		3.65		< 1.53	U	2.36		< 0.627	U	< 44.0	UJ	555		< 0.128	U
GAF-541U	GAF-GW-541U-04242020	58-63	4/24/2020	N	D	< 0.217	U	581000				< 1.53	U	990		< 0.627	U			134000		< 0.128	U
GAF-541U	GAF-GW-541U-04242020		4/24/2020	N	T	0.554	J	586000		12.2		< 1.53	U	959		< 0.627	U	< 113	U*	136000		< 0.537	U*
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	D	< 0.217	U	523000	J			< 1.53	U	707		< 1.87	U*			115000	J	< 0.128	U
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	T	0.499	J	540000		12.1		< 1.53	U	733		< 0.906	U*	< 65.8	U	133000		< 0.477	U*
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	D	< 0.217	U	511000				< 1.53	U	668		< 0.627	U			120000		< 0.128	U
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	T	< 0.217	U	536000		10.6		< 1.53	U	725		< 0.627	U	< 180	U*	132000		< 0.128	U
GAF-541U	GAF-GW-541U-10222020		10/22/2020	N	T	< 0.217	U	554000		11.2		< 1.53	U	907		< 0.627	U	< 110	U	146000		< 0.128	U

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					Parameter	Lithium		Magnesium		Manganese		Mercury		Molybdenum		Nickel		nitrate-nitrite nitrogen		Nitrogen, Kjeldahl, Total		Phosphate as PO4	
					Unit	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		mg/L		mg/L		mg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-448U	GAF-GW-448U-01202020	35-50	1/20/2020	N	D	< 3.39	U	14800	J	12000	J	< 0.101	U	< 0.610	U	0.558	J						
GAF-448U	GAF-GW-448U-01202020		1/20/2020	N	T	< 3.39	U	12700	J	7690	J	< 0.101	U	1.23	J	1.05		< 0.0650	U	13.3	J	1.04	
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	D	< 6.22	U*	15100		9610		< 0.130	U	0.659	J	0.605	J						
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	T	< 6.68	U*	14800		9660		< 0.130	U	< 0.610	U	< 1.01	U*	< 0.0650	U	12.3		2.25	
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	D	< 3.39	U	15300	J	8580	J	< 0.130	U	0.700	J	1.33							
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	T	< 3.39	U	15800		7480	J	< 0.130	U	0.886	J	< 1.55	U*	< 0.0680	U*	14.6		0.666	
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	D	< 3.39	U	15300		10800	J	< 0.130	U	< 0.610	U	0.800	J						
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	T	< 3.39	U	15300		8000	J	< 0.130	U	< 0.610	U	1.01		< 0.0650	U	14.3		1.92	
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	D	< 3.39	U	14800		9280	J	< 0.130	UJ	< 0.610	U	0.779	J						
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	T	< 3.39	U	14800		7290	J	< 0.130	UJ	0.697	J	1.35		< 0.0650	U	14.8		1.86	
GAF-489U	GAF-GW-489U-01212020	44-54	1/21/2020	N	D	< 3.39	U	816		73.3		< 0.101	U	< 0.610	U	3.20	J						
GAF-489U	GAF-GW-489U-01212020		1/21/2020	N	T	< 3.39	U	757		89.2		< 0.101	U	< 0.610	U	2.02	J	1.74		< 0.260	U	< 0.114	U
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	D	< 6.23	U*	946		< 42.7	U*	< 0.130	U	< 0.610	U	1.60							
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	T	< 5.23	U*	912		< 81.3	U*	< 0.130	U	< 0.610	U	3.13		1.50		< 0.663	U*	< 0.114	U
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	D	< 3.39	U	881		89.3		< 0.130	U	< 0.610	U	2.26							
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	T	< 3.39	U	903		90.1		< 0.130	U	< 0.610	U	2.19		1.28		< 0.317	U*	< 0.114	U
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	D	< 3.39	U	923		37.9		< 0.130	U	< 0.610	U	1.21							
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	T	< 3.39	U	966		86.8		< 0.130	U	< 0.610	U	2.17		1.41		< 0.260	U	< 0.114	U
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	D	< 3.39	U	985		126		< 0.130	U	< 0.610	U	1.92							
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	T	< 3.39	U	1010		193		< 0.130	U	< 0.610	U	3.05		1.42		< 0.260	U	< 0.114	U
GAF-526U	GAF-GW-526U-04232020	63-68	4/23/2020	N	D	< 11.0	U*	14000		4170		< 0.130	U	5.64		3.03							
GAF-526U	GAF-GW-526U-04232020		4/23/2020	N	T	< 10.3	U*	14400		4400		< 0.130	U	5.31		3.53		< 0.0650	U	< 0.783	U*	< 0.187	U*
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	D	4.76	J	16600		5790		< 0.130	U	7.16		4.57							
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	T	4.06	J	17200		6440		< 0.130	U	7.48		4.91		< 0.0650	U	< 0.478	U*	< 0.114	U
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	D	4.42	J	17200		4580		< 0.130	U	5.15		3.58							
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	T	4.58	J	17400		4620		< 0.130	U	5.47		4.32		< 0.0650	U	< 0.260	U	< 0.114	U
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	D	3.55	J	17100		2580		< 0.130	UJ	3.81	J	2.60							
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	T	4.18	J	16600		2920		< 0.130	UJ	3.77	J	2.49		< 0.0650	U	0.348	J	< 0.114	U
GAF-541U	GAF-GW-541U-04242020	58-63	4/24/2020	N	D	34.7		71000		114000		< 0.130	U	< 0.610	U	345							
GAF-541U	GAF-GW-541U-04242020		4/24/2020	N	T	34.2		71100		113000		< 0.130	U	< 0.610	U	337		< 0.0650	U	< 1.20	U*	< 0.246	U*
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	D	30.2		61200	J	97300	J	< 0.130	U	< 0.610	U	241							
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	T	33.5		65500		97200		< 0.130	U	< 0.610	U	261		< 0.784	U*	< 0.670	U*	0.128	J
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	D	25.2		62400		96700		< 0.130	U	< 0.610	U	225							
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	T	26.7		64800		102000		< 0.130	U	< 0.610	U	243		< 0.0650	U	0.696		< 0.114	U
GAF-541U	GAF-GW-541U-10222020		10/22/2020	N	T	26.6		75400		119000		< 0.130	U	< 0.610	U	325		< 0.0650	U	0.915		< 0.114	U

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					Parameter	Phosphorus		Potassium		Radium-226		Radium 228		Radium 226 + Radium 228		Selenium		Silicon		Silver		Sodium	
					Unit	mg/L		µg/L		pCi/L		pCi/L		pCi/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-448U	GAF-GW-448U-01202020	35-50	1/20/2020	N	D			1810		0.230	J	-0.0753	U	0.230	J	< 1.51	U	5500		< 0.177	U	11100	
GAF-448U	GAF-GW-448U-01202020		1/20/2020	N	T	0.386		2430		0.153		-0.0608	U	0.153	J	< 1.51	U	4870		< 0.177	U	11500	
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	D			2150		0.330		0.558	U	0.888	J	< 1.51	U	5070		< 0.177	U	11400	
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	T	0.834		2090		0.202	U	0.122	U	0.324	U	< 1.51	U	5390		< 0.177	U	11200	
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	D			2570	J	0.341		0.178	U	0.519	J	< 1.51	U	4980	J	< 0.177	U	12100	J
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	T	< 0.387	U*	2490		0.459		0.261	U	0.720	J	< 1.51	U	4810		< 0.177	U	12300	
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	D			1940		0.330	U	0.344	U	0.674	U	< 1.51	U	6040	J	< 0.177	U	11700	
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	T	0.635		2670		0.364		0.730		1.09		< 1.51	U	5340	J	< 0.177	U	11300	
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	D			2140		0.270		0.987		1.26		< 1.51	U	5350		< 0.177	U	11000	
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	T	0.699		2420		0.250	U	0.207	U	0.457	U	< 1.51	U	5280		< 0.177	U	10400	
GAF-489U	GAF-GW-489U-01212020	44-54	1/21/2020	N	D			500		0.00900	U	0.203	U	0.212	U	< 1.51	U	3430		< 0.177	U	5830	
GAF-489U	GAF-GW-489U-01212020		1/21/2020	N	T	< 0.0320	U	504		0.0697	U	0.246	U	0.316	U	< 1.51	U	3440		< 0.177	U	6390	
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	D			546		0.0660	U	0.0772	U	0.143	U	< 1.51	U	3580		< 0.177	U	6330	
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	T	0.0506	J	603		0.0472	U	-0.131	U	0.0472	U	< 1.51	U	3880		< 0.177	U	5790	
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	D			431	J							< 1.51	U	3980		< 0.177	U	6900	
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	T	< 0.0320	U	432	J							< 1.51	U	4070		< 0.177	U	6980	
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	D			508		-0.00901	U	0.105	U	0.105	U	< 1.51	U	4060		< 0.177	U	8230	
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	T	< 0.0320	U	618		0.0950	U	0.0621	U	0.157	U	< 1.51	U	4420		< 0.177	U	8430	
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	D			< 460	U*	0.129	U	-0.0403	U	0.129	U	< 1.51	U	3670		< 0.177	U	8020	J
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	T	< 0.0320	U	< 573	U*	0.0567	UJ	0.0884	UJ	0.145	UJ	< 1.51	U	4070		< 0.177	U	7040	J
GAF-526U	GAF-GW-526U-04232020	63-68	4/23/2020	N	D			7910		0.0344	U	0.0280	U	0.0624	U	< 1.51	U	4020		< 0.177	U	7950	
GAF-526U	GAF-GW-526U-04232020		4/23/2020	N	T	0.0428	J	7840		0.0285	U	0.176	U	0.204	U	< 1.51	U	4280		< 0.177	U	8070	
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	D			8470		0.161	U	0.771	U*	0.932	U*	< 1.51	U	4590		< 0.177	U	7990	
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	T	< 0.0320	U	8220		0.267		0.590	U*	0.857	J	< 1.51	U	4440		< 0.177	U	7310	
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	D			9070		0.171	U	0.973	U*	1.14	U*	< 1.51	U	5070		< 0.177	U	9400	
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	T	< 0.0320	U	9200		0.388		0.238	UJ	0.626	J	< 1.51	U	5170		< 0.177	U	9340	
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	D			8730		0.0458	U	0.384	U	0.430	U	< 1.51	U	4900		< 0.177	U	8420	
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	T	< 0.0320	U	9130		-0.0411	U	0.303	U	0.303	U	< 1.51	U	5290		< 0.177	U	9820	
GAF-541U	GAF-GW-541U-04242020	58-63	4/24/2020	N	D			5120		0.00352	U	0.118	UJ	0.121	UJ	< 1.51	U	5640		< 0.177	U	315000	
GAF-541U	GAF-GW-541U-04242020		4/24/2020	N	T	0.0853	J	5110		0.521		0.432	U	0.953	J	< 1.51	U	5680		< 0.177	U	310000	
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	D			4750	J							< 1.51	U	5270	J	< 0.177	U	315000	J
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	T	< 0.0940	U*	4680								< 1.51	U	5420		< 0.177	U	311000	
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	D			5070		0.0946	U	0.509		0.6036	J	< 1.51	U	5010		< 0.177	U	347000	
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	T	< 0.0320	U	5380		0.305		0.215	U	0.519	J	< 1.51	U	5470		< 0.177	U	363000	
GAF-541U	GAF-GW-541U-10222020		10/22/2020	N	T	< 0.0320	U	5490		0.167	UJ	0.449	J	0.617	J	< 1.51	U	4800		< 0.177	U	380000	

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					Parameter	Strontium		Sulfate		Sulfide		Thallium		Total Dissolved Solids		Total Organic Carbon		Total Suspended Solids		Vanadium		Zinc	
					Unit	µg/L		mg/L		mg/L		µg/L		mg/L		mg/L		mg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-448U	GAF-GW-448U-01202020	35-50	1/20/2020	N	D	483	J					< 0.148	U							< 0.991	U	3.24	J
GAF-448U	GAF-GW-448U-01202020		1/20/2020	N	T	416	J	94.8		< 1.34	U	< 0.194	U*	714		24.9		83.8		1.03		4.81	J
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	D	449						< 0.148	U							< 0.991	U	< 4.40	U*
GAF-448U	GAF-GW-448U-04232020		4/23/2020	N	T	456		248		< 1.34	U	< 0.148	U	942		26.8		143		1.65		< 4.72	U*
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	D	483	J					< 0.148	U							< 0.991	U	5.04	
GAF-448U	GAF-GW-448U-06172020		6/17/2020	N	T	459		211		< 1.34	UJ	< 0.148	U	820		23.8		47.9		< 0.991	U	< 4.26	U*
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	D	467						< 0.148	U							< 0.991	U	3.46	J
GAF-448U	GAF-GW-448U-08182020		8/18/2020	N	T	465		203		< 6.70	U	0.168	J	840		24.4		131		1.12		3.85	J
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	D	462						< 0.148	U							< 0.991	U	3.26	J
GAF-448U	GAF-GW-448U-10192020		10/19/2020	N	T	467		155		< 1.34	U	< 0.148	U	806		25.6		109		1.51		6.66	
GAF-489U	GAF-GW-489U-01212020	44-54	1/21/2020	N	D	13.1						< 0.148	U							< 0.991	U	33.8	J
GAF-489U	GAF-GW-489U-01212020		1/21/2020	N	T	12.8		4.08		< 1.34	U	< 0.148	U	44.0		< 0.508	U	1.40		< 0.991	U	16.5	J
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	D	13.4						< 0.148	U							< 0.991	U	< 7.30	U*
GAF-489U	GAF-GW-489U-04232020		4/23/2020	N	T	10.5		< 5.54	U*	< 1.34	U	< 0.148	U	< 10.0	U	0.527	J	5.90		< 0.991	U	< 20.7	U*
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	D	8.96						< 0.148	U							< 0.991	U	8.40	
GAF-489U	GAF-GW-489U-06182020		6/18/2020	N	T	10.8		5.57		< 1.34	U	< 0.148	U	48.0		2.08		5.00		< 0.991	U	6.83	
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	D	11.2						< 0.148	U							< 0.991	U	7.59	
GAF-489U	GAF-GW-489U-08202020		8/20/2020	N	T	11.3		6.32		< 1.34	U	< 0.148	U	98.0		< 2.48	U*	3.00		1.17		8.05	
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	D	13.3						< 0.148	U							< 0.991	U	6.92	
GAF-489U	GAF-GW-489U-10222020		10/22/2020	N	T	13.1		4.35		< 1.34	U	< 0.148	U	45.0		0.564	J	18.6		< 0.991	U	13.4	
GAF-526U	GAF-GW-526U-04232020	63-68	4/23/2020	N	D	690						< 0.278	U*							< 0.991	U	< 3.22	U
GAF-526U	GAF-GW-526U-04232020		4/23/2020	N	T	710		528		< 1.34	U	< 0.270	U*	971		0.861	J	14.0		< 0.991	U	< 3.22	U
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	D	785						0.176	J							< 0.991	U	< 3.22	U
GAF-526U	GAF-GW-526U-06182020		6/18/2020	N	T	804		679		< 1.34	U	< 0.148	U	996		0.620	J	7.60		< 0.991	U	4.55	J
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	D	826						< 0.148	U							< 0.991	U	< 3.22	U
GAF-526U	GAF-GW-526U-08192020		8/19/2020	N	T	827		760		< 1.34	U	0.171	J	1310		0.896	J	4.10		< 0.991	U	8.26	
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	D	701						< 0.148	U							< 0.991	U	< 3.22	U
GAF-526U	GAF-GW-526U-10192020		10/19/2020	N	T	772		712		< 1.34	U	< 0.148	U	1240		0.710	J	4.10		< 0.991	U	< 3.22	U
GAF-541U	GAF-GW-541U-04242020	58-63	4/24/2020	N	D	659						< 0.148	U							< 0.991	U	7.31	
GAF-541U	GAF-GW-541U-04242020		4/24/2020	N	T	708		2270		< 1.34	U	< 0.148	U	2850		2.69		74.0		< 0.991	U	35.3	
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	D	692	J					< 0.148	U							< 0.991	U	12.2	
GAF-541U	GAF-GW-541U-06172020		6/17/2020	N	T	647		2210		< 1.34	UJ	< 0.172	U*	3430		6.02		42.3		< 0.991	U	46.5	
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	D	709						< 0.148	U							< 0.991	U	4.61	J
GAF-541U	GAF-GW-541U-08182020		8/18/2020	N	T	746		2360		< 6.70	U	< 0.148	U	3310		4.33		10.6		< 0.991	U	23.2	
GAF-541U	GAF-GW-541U-10222020		10/22/2020	N	T	885		2590		< 13.4	U	< 0.148	U	3700		2.13		6.20		< 0.991	U	51.0	

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					Parameter	pH, Field	aerated pH	Dissolved Oxygen	ORP	Specific Conductance, Field	Temperature	Turbidity, field	Sulfide	Iron, Ferrous	Carbon Dioxide	Acidity		Alkalinity, Carbonate	
					Unit	pH units	pH units	mg/L	mV	umhos/cm	deg c	NTU	mg/L	mg/L	mg/L	mg/L		mg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Validator Qualifier	Result	Validator Qualifier
GAF-S3	GAF-GW-S3-01202020	48.7-58.7	1/20/2020	N	D														
GAF-S3	GAF-GW-S3-01202020		1/20/2020	N	T	3.80	4.35	0.39	251.4	1470	9.0	12.2		5.5	50	415		< 5.00	U
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	D														
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	T	3.76	3.80	0.34	263.5	2343	15.4	8.75	9	6.0	45	483		< 5.00	U
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	D														
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	T											430	J	< 5.00	U
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	D														
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	T	3.70		0.19	273.3	2543	17.2	7.44	0	2.7	>100	531	J	< 5.00	U
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	D														
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	T	3.60	3.6	0.13	260.7	2446	17.9	7.43	0	1.5	>100	434		< 5.00	U
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	D														
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	T	4.06	4.0	0.21	131.8	2233	16.1	12.1	0	5	>100	406		< 5.00	U

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Well Groundwater Analytical Results, January to October 2020
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

					Parameter	Alkalinity, Hydroxide as		Alkalinity, Total as CaCO3		Alkalinity,Bicarbonate (CaCO3)		Aluminum		Antimony		Arsenic		Barium		Beryllium		Boron	
					Unit	mg/L		mg/L		mg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-S3	GAF-GW-S3-01202020	48.7-58.7	1/20/2020	N	D							20300		< 0.378	U	1.50		14.8		5.30		5170	
GAF-S3	GAF-GW-S3-01202020		1/20/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	20700		< 0.378	U	1.86		17.1		6.34		5140	
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	D							22200		< 0.872	U*	3.72		14.5		4.61		5750	
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	22700		< 0.378	U	3.91		15.0		4.39		5620	
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	D							21300		< 0.378	U	3.48		15.1		5.12		5650	
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	T	< 5.00	U	< 5.00	U	< 5.00	U	22000		< 0.378	U	3.52		16.3		4.98		5360	
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	D							21000		< 0.378	U	3.29		14.5		4.90		5130	
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	21400		< 0.378	U	3.51		15.8		5.06		5230	
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	D							20700		< 0.378	U	2.95		11.3		3.83		5810	
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	20700		< 0.378	U	3.13		12.4		4.08		5770	
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	D							19800		< 0.378	U	4.21		14.5		4.37		5670	J
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	T	< 5.00	U	< 5.00	U	< 5.00	U	19500		< 0.378	U	3.98		15.9		4.26		5450	

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NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

					Parameter	Cadmium		Calcium		Chloride		Chromium		Cobalt		Copper		Fluoride		Iron		Lead	
					Unit	µg/L		µg/L		mg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-S3	GAF-GW-S3-01202020	48.7-58.7	1/20/2020	N	D	8.41		467000				< 1.53	U	318		11.0				165000		1.86	
GAF-S3	GAF-GW-S3-01202020		1/20/2020	N	T	8.24		465000		2.91		1.67	J	310		10.7		249		160000		1.82	
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	D	8.45		475000				< 1.53	U	328		< 11.5	U*			170000		1.74	
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	T	8.37		476000		3.53		< 1.53	U	332		< 11.9	U*	452		172000		< 1.82	U*
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	D	8.23		472000				< 1.53	U	327		11.7				171000		1.64	
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	T	8.51		486000		3.36	J	1.84	J	326		11.4		363		175000		1.80	
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	D	8.46		464000				< 1.53	U	325		11.2				165000		1.62	
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	T	8.47		472000		3.08		1.88	J	323		11.3		351		168000		1.77	
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	D	7.47		472000				< 1.53	U	301		10.9				162000		1.42	
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	T	7.64		473000		3.15		< 1.53	U	311		10.6		< 102	U*	162000		1.53	
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	D	7.90		433000				< 1.53	U	306		11.0				140000		1.38	
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	T	7.70		427000		3.04		< 1.53	U	299		9.63		306		137000		1.45	

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NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

					Parameter	Lithium		Magnesium		Manganese		Mercury		Molybdenum		Nickel		nitrate-nitrite nitrogen		Nitrogen, Kjeldahl, Total		Phosphate as PO4	
					Unit	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		mg/L		mg/L		mg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-S3	GAF-GW-S3-01202020	48.7-58.7	1/20/2020	N	D	31.3		27100		26500		< 0.101	U	< 0.610	U	140							
GAF-S3	GAF-GW-S3-01202020		1/20/2020	N	T	30.8		27100		25700		< 0.101	U	< 0.610	U	139		< 0.0650	U	0.562	J	0.182	J
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	D	< 33.6	U*	28000		25900		< 0.130	U	< 0.610	U	154							
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	T	< 33.4	U*	27400		25900		< 0.130	U	< 0.610	U	155		< 0.0650	U	< 0.711	U*	< 0.227	U*
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	D	33.1		27900		26500		< 0.130	U	< 0.610	U	152							
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	T	33.6		29100		28000		< 0.130	U	< 0.610	U	152		< 0.0650	U	< 0.827	U*	< 0.114	U
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	D	32.6		27200		26600		< 0.130	U	< 0.610	U	150							
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	T	32.9		28300		26500		< 0.130	U	< 0.610	U	150		< 0.0650	U	< 0.741	U*	< 0.114	U
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	D	30.0		27000		23900		< 0.130	U	< 0.610	U	140							
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	T	30.4		27000		24900		< 0.130	U	< 0.610	U	145		< 0.0650	U	0.601		0.131	J
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	D	29.0		26600		25200		< 0.130	U	< 0.610	U	140							
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	T	28.0		25900		24500		< 0.130	U	< 0.610	U	136		< 0.0650	U	0.700		< 0.114	U

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NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

					Parameter	Phosphorus		Potassium		Radium-226		Radium 228		Radium 226 + Radium 228		Selenium		Silicon		Silver		Sodium	
					Unit	mg/L		µg/L		pCi/L		pCi/L		pCi/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-S3	GAF-GW-S3-01202020	48.7-58.7	1/20/2020	N	D			14700		0.313	J	0.762		1.07	J	< 1.51	U	9640		< 0.177	U	9450	
GAF-S3	GAF-GW-S3-01202020		1/20/2020	N	T	< 0.0320	U	14700		0.378		0.723		1.10		1.82	J	9160		< 0.177	U	9430	
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	D			15100		0.249		0.123	U	0.372	J	< 1.51	U	9230		< 0.177	U	9950	
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	T	< 0.0320	U	15400		0.383		0.00252	U	0.385	J	< 1.51	U	9610		< 0.177	U	23800	
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	D			15600		0.351		1.52	U*	1.87	J	< 1.51	U	10500		< 0.177	U	10100	
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	T	< 0.0320	U	16000		0.361		0.593	U*	0.954	J	< 1.51	U	10400		< 0.177	U	10600	
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	D			15300		0.418		1.38	U*	1.80	J	< 1.51	U	10100		< 0.177	U	10000	
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	T	< 0.0320	U	15400		0.522		0.997	J	1.52	J	< 1.51	U	10200		< 0.177	U	10300	
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	D			16100		0.296		0.944	U*	1.24	J	< 1.51	U	9810		< 0.177	U	10100	
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	T	0.0429	J	15800		0.343		1.07		1.42		< 1.51	U	9980		< 0.177	U	10000	
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	D			14900		0.312		0.452		0.764		< 1.51	U	9050		< 0.177	U	9940	
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	T	< 0.0320	U	14600		0.444	J	0.401	J	0.844	J	< 1.51	U	9060		< 0.177	U	9670	

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Well Groundwater Analytical Results, January to October 2020
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

					Parameter	Strontium		Sulfate		Sulfide		Thallium		Total Dissolved Solids		Total Organic Carbon		Total Suspended Solids		Vanadium		Zinc	
					Unit	µg/L		mg/L		mg/L		µg/L		mg/L		mg/L		mg/L		µg/L		µg/L	
Location ID	Sample ID	Screen Depth (ft)	Sample Date	Sample Type	Total or Dissolved	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
GAF-S3	GAF-GW-S3-01202020	48.7-58.7	1/20/2020	N	D	1570						< 1.29	U*							< 4.16	U*	228	
GAF-S3	GAF-GW-S3-01202020		1/20/2020	N	T	1560		1270		< 6.70	U	< 1.44	U*	2580		0.624	J	2.40		4.78		220	
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	D	1440						< 1.53	U*							4.08		247	
GAF-S3	GAF-GW-S3-04232020		4/23/2020	N	T	1490		1770		< 1.34	U	< 1.81	U*	1880		0.884	J	10.4		4.14		340	
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	D	1460						1.31								4.42		253	
GAF-S3	GAF-GW-903B-06182020		6/18/2020	FD	T	1460		1740		5.17		1.49		1900		0.652	J	3.70		5.04		240	
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	D	1450						1.36								4.44		237	
GAF-S3	GAF-GW-S3-06182020		6/18/2020	N	T	1450		1790		2.23	J	1.54		1890		0.715	J	2.80		4.65		235	
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	D	1060						1.11								4.31		232	
GAF-S3	GAF-GW-S3-08192020		8/19/2020	N	T	1080		1950		< 6.70	U	1.13		1800		0.872	J	2.60		4.51		241	
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	D	1440						1.19								3.95		219	
GAF-S3	GAF-GW-S3-10222020		10/22/2020	N	T	1420		1870		< 6.70	U	1.13		2500		< 0.508	U	3.50		4.20		218	

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Table 4-2a
In Situ Groundwater Analytical Results, 2020 Investigation
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

					Parameter	pH, Field	Dissolved Oxygen	ORP	Specific Conductance, Field	Temperature	Beryllium		Cadmium		Iron		Lithium		Nickel	
					Unit	pH units	mg/L	MV	umhos/cm	deg C	µg/L		µg/L		µg/L		µg/L		µg/L	
Location ID	Sample Depth (ft bgs)	Sample Date	Sample Type	Total or Dissolved		Result	Result	Result	Result	Result	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier	Result	Validator Qualifier
NRS 052	35 - 39	1/30/2020	N	D							0.182	U	0.217	U	17400		3.39	U	11.1	
NRS 052		1/30/2020	N	T		7.0	1.11	-81.2	1783	12.2	6.24	J	4.74	J	122000		36.3	J	125	
NRS 053	68 - 72	1/29/2020	N	D							11.1		54.2		14400		7.98		51.2	
NRS 053		1/29/2020	N	T		6.8	1.52	6.1	2424	14.5	554		2700		958000		352		1540	
NRS 054	62 - 66	1/29/2020	N	D							0.229	J	1.25		595000		20.8		311	
NRS 054		1/29/2020	N	T		7.0	2.04	-66.4	3504	6.3	88		35.7		2040000		521		1710	
NRS 055	66 - 70	1/28/2020	N	D							6.28		20.3		152000		25.7		142	
NRS 055		1/28/2020	N	T		6.5	0.70	-29.7	2619	13.9	170		460		926000		311		1400	
NRS 056	65 - 69	1/27/2020	N	D							0.182	U	0.217	U	41.6	U*	3.39	U	10.9	
NRS 056		1/27/2020	N	T		7.5	4.92	215.1	1430	12.6	88.8		34.1		2330000		623		2970	
NRS 057	16 - 20	2/3/2020	N	D							1.23		0.998	J	558000	J	229		51.1	
NRS 057		2/3/2020	N	T		5.6	0.82	-1.8	3469	20.7	9.87		43.2		546000		277		113	
NRS 058	16 - 20	2/3/2020	N	D							0.182	U	0.217	U	620000	J	285		6.48	
NRS 058		2/3/2020	N	T		6.5	0.07	-92.0	3559	19.4	5.53		6.68		712000		309		50.1	
NRS 058	59 - 63	2/3/2020	N	T		6.6	0.63	71.4	1222	19.8										
NRS 059	41 - 45	2/4/2020	N	D							0.182	U	0.221	J	12800	J	4.82	J	26.7	
NRS 059		2/4/2020	N	T		6.5	1.19	-82.4	1449	17.6	5.09		3.77		179000		37.8		158	
NRS 060	16 - 20	1/31/2020	N	D							3.52		3.24	J	1240000	J	167		204	
NRS 060		1/31/2020	N	T		4.9	1.04	101.7	4319	16.0	12.6		15		1160000		321		532	
NRS 060	71 - 75	2/3/2020	N	D							31	J	86.2		4430000	J	170	U	4000	
NRS 060		2/3/2020	N	T		5.1	3.59	78.4	10206	17.5	151		90.3		5190000		332		5170	
NRS 061	14 - 18	1/31/2020	N	D							21.2	J	10.9	U	2520000	J	338		237	
NRS 061		1/31/2020	N	T		6.2	0.26	-91.7	3810	12.5	502		445		6950000		1150		2790	
NRS 061	38 - 42	1/31/2020	N	D							6.01		6.19		341000	J	51.4		523	
NRS 061		1/31/2020	N	T		5.9	1.79	-28.9	4466	16.0	295		344		6530000		1110		2850	
NRS 062	29 - 33	1/30/2020	FD	D							0.182	U	0.217	U	3670	J	11.7		40.6	
NRS 062		1/30/2020	FD	T							27.2		8.1	J	573000		238		493	
NRS 062		1/30/2020	N	D							0.182	U	0.217	U	3460	J	9.69		40.9	
NRS 062		1/30/2020	N	T		6.5	1.19	11.9	2751	15.2	22.7		5.56	J	507000		205		430	
NRS 064	11-15	2/4/2020	N	D							0.182	U	0.217	U	434	U*	53.1		0.995	J
NRS 064		2/4/2020	N	T		10.2	3.83	150.4	1028		9.01		9.28		66100		75.3		59.4	
NRS 064	44-48	2/5/2020	N	T		8.5	1.90	42.0	423.5	17.0										
NRS 065	43 - 47	2/4/2020	N	D							1.58		0.217	U	29900	J	18.1		29.7	
NRS 065		2/4/2020	N	T		8.7	8.18	164.0	355.3		8.68		1.36		167000		83.3		161	

Notes:

µg/L = micrograms per liter
deg C = degrees Celsius
ft bgs = feet below ground surface
mg/L = milligrams per liter
MV = millivolts
umhos/cm = microSiemens

D = Dissolved
FD = field duplicate sample
J = Quantitation is approximate due to limitations identified during data validation.
N = primary sample
T = Total
U* = This result should be considered “not detected” because it was detected in a rinsate blank or laboratory blank at a similar level.
U = Not detected above reporting limit shown.

Table 4-2b
In Situ Groundwater pH and Iron (II), 2015 Investigation
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Location ID	Date	Sample Depth Inverval (ft bgs)	pH	Fe (II) (mg/L)
NRS001W	7/10/2015	53-57	5.5	2.13
NRS002W	7/13/2015	45-49	7.1	NM
NRS003A	3/26/2015	18.7-22.7	6.8	NM
NRS003B	4/1/2015	36.0-40.0	DRY	
NRS003W	7/11/2015	39-43	6.5	5.5
NRS004A	3/27/2015	20.7-24.7	6.4	NM
NRS004B	3/27/2015	30.8-34.8	5.7	NM
NRS005A	3/31/2015	14.2-18.2	6.4	NM
NRS005B	3/31/2015	31.3-35.3	6.2	NM
NRS005C	3/31/2015	38.7-42.7	DRY	
NRS006A	3/30/2015	10.8-14.8	6.1	NM
NRS006B	4/1/2015	32.0-36.0	DRY	
NRS007A	4/1/2015	45.0-49.0	5.3	NM
NRS007A	4/2/2015	39.0-49.0	4.3	NM
NRS007A	4/7/2015	39.0-49.0	4.0	NM
NRS009A	3/27/2015	11.5-16.5	6.9	NM
NRS009B	3/26/2015	3.0-8.0	DRY	
NRS012A	3/27/2015	10.7-14.7	7.2	NM
NRS012B	4/2/2015	20.0-24.0	6.1	NM
NRS015W	7/13/2015	45-49	6.7	4.32
NRS018W	7/10/2015	31-35	5.1	NM
NRS020W	7/10/2015	28-32	5.9	NM
NRS022W	7/14/2015	48-52	6.5	4.06
NRS035W	7/14/2015	10-14	7.1	5.44
NRS035W	7/14/2015	24-28	9.3	2.73
NRS036WA	7/14/2015	15-19	9.3	5.44
NRS040W	7/14/2015	13-17	6.5	5.5
NRS042W	7/14/2015	44-48	4.5	5.45
NRS044W	7/15/2015	24-28	10.2	NM

Notes:
Groundwater samples for Fe (II) analysis were collected at the beginning of purging, as groundwater recovery was poor at the majority of sampling locations.
ft bgs = feet below ground surface
mg/L = milligrams per liter
NM = Not measured

Table 4-3
Field Soil pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Location ID	Date	Depth Interval (ft bgs)	pH
NRS001	3/12/2015	4.0-5.0	3.9
NRS001	3/12/2015	9.0-10.0	3.9
NRS001	3/12/2015	10.6-11.2	5.2
NRS001	3/12/2015	14.0-15.0	3.9
NRS001	3/12/2015	17.7-18.0	4.9
NRS001	3/12/2015	19.0-20.0	4.3
NRS001	3/12/2015	21.6-22.5	4.8
NRS001	3/12/2015	24.0-25.0	4.9
NRS001	3/12/2015	26.1-26.7	3.5
NRS001	3/12/2015	29.0-30.0	3.6
NRS001	3/12/2015	31.0-32.6	3.6
NRS001	3/12/2015	34.0-35.0	4.0
NRS001	3/12/2015	35.0-36.0	4.0
NRS001	3/12/2015	39.0-40.0	3.6
NRS001	3/12/2015	40.0-40.2	3.6
NRS001	3/12/2015	44.0-45.0	3.9
NRS001	3/12/2015	45.2-45.8	3.7
NRS001	3/12/2015	49.0-50.0	4.0
NRS001	3/12/2015	54.0-55.0	3.9
NRS001	3/12/2015	59.0-60.0	4.0
NRS001S	7/7/2015	0-5	5.0
NRS001S	7/7/2015	5-10	4.3
NRS001S	7/7/2015	10-15	4.9
NRS001S	7/7/2015	15-20	5.6
NRS001S	7/7/2015	20-25	4.7
NRS001S	7/7/2015	25-30	4.7
NRS001S	7/7/2015	30-35	3.9
NRS001S	7/7/2015	35-40	3.9
NRS001S	7/7/2015	40-43	4.1
NRS001S	7/7/2015	43-45	5.4
NRS001S	7/7/2015	45-50	4.3
NRS001S	7/7/2015	50-55	4.3
NRS001S	7/7/2015	55-58	4.0
NRS002	3/16/2015	4.0-5.0	4.8
NRS002	3/16/2015	9.0-10.0	4.4
NRS002	3/16/2015	14.0-15.0	4.7
NRS002	3/16/2015	17.8-17.9	5.6
NRS002	3/16/2015	17.9-18.4	5.6
NRS002	3/16/2015	19.0-20.0	5.0
NRS002	3/16/2015	24.0-25.0	4.3
NRS002	3/16/2015	29.0-30.0	5.4
NRS002	3/16/2015	32.5-33.0	6.0
NRS002	3/16/2015	34.0-34.4	5.9
NRS002	3/16/2015	34.4-35.0	5.9
NRS002	3/16/2015	39.0-40.0	4.8
NRS002	3/16/2015	44.0-45.0	5.8
NRS002	3/16/2015	47.0-50.0	5.7
NRS002	3/16/2015	54.0-55.0	6.1
NRS002S	7/7/2015	0-5	4.3
NRS002S	7/7/2015	5-10	4.6
NRS002S	7/7/2015	10-15	5.3
NRS002S	7/7/2015	15-20	4.7
NRS002S	7/7/2015	20-25	4.7

Table 4-3
Field Soil pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Location ID	Date	Depth Interval (ft bgs)	pH
NRS002S	7/7/2015	25-28	4.5
NRS002S	7/7/2015	28-33	5.3
NRS002S	7/7/2015	33-38	5.2
NRS002S	7/7/2015	38-43	5.0
NRS002S	7/7/2015	43-48	5.7
NRS002S	7/7/2015	48-53	5.7
NRS002S	7/8/2015	53-56.5	6.9
NRS003	3/17/2015	4.0-4.5	6.3
NRS003	3/17/2015	4.5-5.0	6.3
NRS003	3/17/2015	9.0-10.0	6.7
NRS003	3/17/2015	14.5-15.0	6.8
NRS003	3/17/2015	19.5-20.0	6.8
NRS003	3/17/2015	24.0-25.0	6.6
NRS003	3/17/2015	27.0-27.5	5.5
NRS003	3/17/2015	28.0-28.5	6.0
NRS003	3/17/2015	29.5-30.0	5.2
NRS003	3/17/2015	32.0-32.5	4.8
NRS003	3/17/2015	33.5-34.0	4.1
NRS003	3/17/2015	34.5-35.0	4.1
NRS003	3/17/2015	37.0-39.0	4.5
NRS003	3/17/2015	39.0-40.0	3.9
NRS003	3/17/2015	44.0-45.0	4.1
NRS003	3/17/2015	49.0-50.0	6.3
NRS003	3/17/2015	53.0-53.9	6.8
NRS004	3/18/2015	0.0-0.08	7.7
NRS004	3/18/2015	7.0-7.5	7.6
NRS004	3/18/2015	9.0-10.0	7.6
NRS004	3/18/2015	12.0-13.0	7.8
NRS004	3/18/2015	24.0-25.0	5.7
NRS004	3/18/2015	29.0-30.0	5.5
NRS004	3/18/2015	28.1-28.3	5.8
NRS004	3/18/2015	31.0-32.0	5.3
NRS004	3/18/2015	34.0-35.0	4.5
NRS004	3/18/2015	38.5-38.8	4.4
NRS004	3/18/2015	39.0-40.0	4.4
NRS004	3/18/2015	42.5-43.0	4.5
NRS004	3/18/2015	43.9-44.3	4.6
NRS004	3/18/2015	44.3-45.0	5.0
NRS004	3/18/2015	49.0-50.0	5.5
NRS004	3/18/2015	54.0-55.0	5.0
NRS004	3/18/2015	55.0-56.0	6.1
NRS005	3/18/2015	0.0-0.9	7.3
NRS005	3/18/2015	4.0-5.0	6.6
NRS005	3/18/2015	8.2-8.4	6.4
NRS005	3/18/2015	9.0-9.5	6.9
NRS005	3/18/2015	14.0-14.5	4.4
NRS005	3/18/2015	14.5-15.0	4.4
NRS005	3/18/2015	17.5-17.8	6.2
NRS005	3/18/2015	17.8-18.0	5.9
NRS005	3/18/2015	19.0-20.0	6.1
NRS005	3/18/2015	24.0-25.0	6.2
NRS005	3/19/2015	28.7-29.2	5.7
NRS005	3/19/2015	29.2-30.0	5.5

Table 4-3
Field Soil pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Location ID	Date	Depth Interval (ft bgs)	pH
NRS005	3/19/2015	32.0-32.5	4.6
NRS005	3/19/2015	34.0-35.0	4.6
NRS005	3/19/2015	38.7-38.9	4.9
NRS005	3/19/2015	39.0-40.0	4.9
NRS005	3/19/2015	44.0-45.0	5.0
NRS005	3/19/2015	49.0-50.0	5.2
NRS005	3/19/2015	54.0-55.0	5.3
NRS005	3/19/2015	59.5-60.0	5.7
NRS005	3/19/2015	60.0-61.7	7.0
NRS006	3/19/2015	4.5-5.0	7.5
NRS006	3/19/2015	6.0-6.5	7.2
NRS006	3/19/2015	9.0-10.0	5.4
NRS006	3/19/2015	14.0-15.0	4.5
NRS006	3/19/2015	19.0-20.0	4.1
NRS006	3/19/2015	22.3-23.0	4.1
NRS006	3/19/2015	23.0-23.5	4.3
NRS006	3/19/2015	24.0-25.0	4.2
NRS006	3/19/2015	29.0-30.0	4.7
NRS006	3/19/2015	34.0-35.0	4.4
NRS006	3/19/2015	39.0-40.0	4.5
NRS006	3/19/2015	44.6-50.0	4.6
NRS007	3/19/2015	4.0-5.0	4.5
NRS007	3/19/2015	9.0-10.0	4.4
NRS007	3/19/2015	14.0-15.0	5.3
NRS007	3/19/2015	17.3-17.4	5.3
NRS007	3/19/2015	19.0-20.0	5.9
NRS007	3/19/2015	20.8-22.5	5.4
NRS007	3/19/2015	24.0-25.0	5.4
NRS007	3/19/2015	26.1-26.5	6.0
NRS007	3/19/2015	29.0-29.5	5.7
NRS007	3/19/2015	29.5-30.0	4.4
NRS007	3/19/2015	34.0-35.0	4.2
NRS007	3/19/2015	35.5-36.0	4.0
NRS007	3/19/2015	36.6-37.0	3.9
NRS007	3/19/2015	39.0-40.0	4.0
NRS007	3/19/2015	42.6-43.6	4.1
NRS007	3/19/2015	44.9-45.0	4.1
NRS007	3/19/2015	49.5-50.0	4.6
NRS007	3/19/2015	53.7-55.0	4.3
NRS007	3/19/2015	59.0-60.0	5.3
NRS008	3/24/2015	0.0-0.4	7.5
NRS008	3/24/2015	1.0-2.0	7.0
NRS008	3/24/2015	2.4-3.0	7.5
NRS008	3/24/2015	3.0-3.7	7.6
NRS008	3/24/2015	4.0-5.0	7.9
NRS008	3/24/2015	8.5-9.2	4.1
NRS008	3/24/2015	9.4-9.6	4.4
NRS008	3/24/2015	9.6-10.0	4.5
NRS008	3/24/2015	13.5-14.2	7.0
NRS008	3/24/2015	14.2-15.0	7.5
NRS008	3/24/2015	19.0-20.0	7.3
NRS008	3/24/2015	24.1-25.0	7.0
NRS008	3/24/2015	29.0-30.0	7.1

Table 4-3
Field Soil pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Location ID	Date	Depth Interval (ft bgs)	pH
NRS008	3/24/2015	33.7-34.0	10.5
NRS008	3/24/2015	34.0-35.0	5.2
NRS008	3/24/2015	39.0-40.0	7.8
NRS008	3/24/2015	44.0-45.0	4.8
NRS008S	7/13/2015	0-1.3	7.5
NRS008S	7/13/2015	1.3-2.8	7.5
NRS008S	7/13/2015	2.8-3.3	7.8
NRS008S	7/13/2015	4.6-6.1	7.3
NRS008S	7/13/2015	6.1-8.0	7.1
NRS008S	7/13/2015	8-10	5.4
NRS008S	7/13/2015	11.7-12.2	7.3
NRS008S	7/13/2015	12.2-13.6	8.2
NRS008S	7/13/2015	13.6-15	7.9
NRS008S	7/13/2015	15-16.6	7.6
NRS008S	7/13/2015	16.6-20	9.1
NRS008S	7/13/2015	20-24.8	9.6
NRS008S	7/13/2015	24.8-25	7.4
NRS008S	7/13/2015	25-27.5	6.4
NRS008S	7/13/2015	27.5-30	7.4
NRS008S	7/13/2015	33.5-35	7.1
NRS008S	7/13/2015	35-40	8.7
NRS008S	7/13/2015	40-41.8	6.6
NRS008S	7/13/2015	41.8-45	5.5
NRS008S	7/13/2015	45-47	5.2
NRS008S	7/13/2015	47-49	5.1
NRS008S	7/14/2015	49-51.9	4.8
NRS008S	7/14/2015	51.9-53	4.6
NRS008S	7/14/2015	53-55.7	4.7
NRS008S	7/14/2015	55.7-57	4.8
NRS008S	7/14/2015	57-59	5.7
NRS008S	7/14/2015	59-61	4.6
NRS008S	7/14/2015	61-64.2	4.9
NRS008S	7/14/2015	64.2-65	4.9
NRS008S	7/14/2015	66-67.9	5.7
NRS008S	7/14/2015	67.9-69	5.2
NRS008S	7/14/2015	69-71	7.3
NRS008S	7/14/2015	71-73	7.5
NRS008S	7/14/2015	73-75	7.6
NRS008S	7/14/2015	75-77	7.4
NRS008S	7/14/2015	77-79	7.7
NRS008S	7/14/2015	79-81	7.8
NRS008S	7/14/2015	81-83	8.5
NRS008S	7/14/2015	83-85	8.1
NRS008S	7/14/2015	85-87	8.1
NRS008S	7/14/2015	87-89	8.1
NRS009	3/26/2015	0.0-0.25	7.0
NRS009	3/26/2015	0.25-0.5	7.7
NRS009	3/26/2015	2.0-3.0	5.3
NRS009	3/26/2015	3.0-4.0	7.2
NRS009	3/26/2015	4.0-5.0	8.0
NRS009	3/26/2015	5.5-6.0	7.6
NRS009	3/26/2015	6.0-6.5	8.0
NRS009	3/26/2015	7.0-8.0	8.3

Table 4-3
Field Soil pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Location ID	Date	Depth Interval (ft bgs)	pH
NRS009	3/26/2015	9.0-10.0	8.1
NRS009	3/26/2015	12.0-13.0	8.0
NRS009	3/26/2015	14.0-15.0	7.5
NRS009	3/26/2015	15.0-16.0	7.8
NRS009	3/26/2015	16.0-16.4	7.9
NRS010	3/26/2015	0.1-2.0	7.0
NRS010	3/26/2015	3.0-4.0	6.9
NRS010	3/26/2015	4.0-5.0	6.9
NRS010	3/26/2015	5.0-6.0	7.2
NRS010	3/26/2015	7.0-8.0	7.7
NRS010	3/26/2015	9.0-10.0	7.3
NRS010	3/26/2015	12.0-13.0	7.9
NRS010	3/26/2015	14.0-15.0	7.7
NRS010	3/26/2015	15.0-16.0	7.8
NRS010	3/26/2015	17.0-17.4	7.3
NRS010	3/26/2015	18.0-18.6	6.9
NRS011	3/26/2015	0.0-1.0	6.8
NRS011	3/26/2015	2.0-3.0	5.3
NRS011	3/26/2015	4.0-5.0	5.6
NRS011	3/26/2015	5.0-6.0	5.1
NRS011	3/26/2015	6.25-6.75	4.9
NRS011	3/26/2015	7.0-8.0	4.8
NRS011	3/26/2015	9.0-10.0	4.8
NRS011	3/26/2015	10.0-11.0	5.8
NRS011	3/26/2015	11.0-12.0	5.9
NRS011	3/26/2015	13.0-14.0	5.5
NRS011	3/26/2015	14.0-15.0	6.2
NRS011	3/26/2015	15.0-15.5	6.7
NRS011	3/26/2015	15.5-16.0	7.2
NRS011	3/26/2015	17.0-17.4	7.3
NRS012	4/2/2015	0.0-0.08	6.7
NRS012	4/2/2015	3.0-4.0	6.7
NRS012	4/2/2015	4.3-5.0	7.1
NRS012	4/2/2015	7.4-8.0	6.8
NRS012	4/2/2015	9.4-10.0	7.8
NRS012	4/2/2015	13.0-13.7	8.2
NRS012	4/2/2015	14.0-15.0	7.5
NRS012	4/2/2015	17.0-18.0	7.6
NRS012	4/2/2015	19.0-20.0	6.8
NRS012	4/2/2015	22.0-23.0	7.1
NRS012	4/2/2015	24.0-25.0	4.9
NRS012S	7/8/2015	0-2.5	5.6
NRS012S	7/8/2015	2.5-5	5.7
NRS012S	7/8/2015	5-7.5	6.2
NRS012S	7/8/2015	7.5-10	6.6
NRS012S	7/8/2015	10-12.5	7.0
NRS012S	7/8/2015	12.5-15	7.0
NRS012S	7/8/2015	15-17.5	6.8
NRS012S	7/8/2015	17.5-20	6.6
NRS012S	7/8/2015	20-22.5	6.4
NRS012S	7/8/2015	22.5-25	4.1
NRS012S	7/8/2015	25-27.5	3.8
NRS012S	7/8/2015	27.5-30	3.9

Table 4-3
Field Soil pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Location ID	Date	Depth Interval (ft bgs)	pH
NRS012S	7/8/2015	30-32.5	4.1
NRS012S	7/8/2015	32.5-35	4.1
NRS012S	7/8/2015	35-37.5	4.3
NRS012S	7/8/2015	37.5-40	4.7
NRS012S	7/8/2015	40-42.5	4.9
NRS012S	7/8/2015	42.5-45	5.0
NRS012S	7/8/2015	45-47.5	5.0
NRS012S	7/8/2015	47.5-50	7.5
NRS012S	7/8/2015	50-51	7.4
NRS013	3/31/2015	4.0-5.0	3.3
NRS013	3/31/2015	9.0-10.0	4.4
NRS013	3/31/2015	19.0-20.0	6.2
NRS013	3/31/2015	29.0-30.0	7.4
NRS013	3/31/2015	33.5-33.8	8.3
NRS013	3/31/2015	33.8-34.8	8.4
NRS013	3/31/2015	44.0-45.0	10.0
NRS013	3/31/2015	54.0-55.0	5.0
NRS013	3/31/2015	64.2-65.0	4.6
NRS013	3/31/2015	74.0-75.0	6.6
NRS014	4/1/2015	3.0-4.0	5.7
NRS014	4/1/2015	6.0-7.0	7.8
NRS014	4/1/2015	8.0-9.0	5.2
NRS014	4/1/2015	10.0-11.0	5.2
NRS014	4/1/2015	12.0-13.0	4.8
NRS014	4/1/2015	24.0-25.0	5.7
NRS014	4/1/2015	34.0-35.0	6.5
NRS017S	7/14/2015	0-2.5	4.7
NRS017S	7/14/2015	2.5-5	4.4
NRS017S	7/14/2015	5-7.5	4.2
NRS017S	7/14/2015	7.5-10	5.0
NRS017S	7/14/2015	10-12.5	5.4
NRS017S	7/14/2015	12.5-15	6.0
NRS017S	7/14/2015	15-16.5	5.0
NRS017S	7/14/2015	16.5-17.5	6.7
NRS017S	7/14/2015	17.5-18.5	6.6
NRS017S	7/14/2015	18.5-20	5.1
NRS017S	7/14/2015	20-22.5	5.6
NRS017S	7/14/2015	22.5-24	5.2
NRS017S	7/14/2015	24-25	4.7
NRS017S	7/14/2015	25-26	4.1
NRS017S	7/14/2015	26-27.5	4.0
NRS017S	7/14/2015	27.5-30	4.0
NRS017S	7/14/2015	30-32.5	4.0
NRS017S	7/14/2015	32.5-35	4.2
NRS017S	7/14/2015	35-37.5	4.4
NRS017S	7/14/2015	37.5-40	4.5
NRS017S	7/14/2015	40-42.5	4.6
NRS017S	7/14/2015	42.5-45	5.2
NRS017S	7/14/2015	45-47.5	6.3
NRS017S	7/14/2015	47.5-50	7.8
NRS018S	7/13/2015	0-2.5	4.7
NRS018S	7/13/2015	2.5-5	3.6
NRS018S	7/13/2015	5-7.5	3.8

Table 4-3
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Location ID	Date	Depth Interval (ft bgs)	pH
NRS018S	7/13/2015	7.5-10	3.8
NRS018S	7/13/2015	10-12.5	4.5
NRS018S	7/13/2015	12.5-15	5.1
NRS018S	7/13/2015	15-17.5	5.4
NRS018S	7/13/2015	17.5-20	5.7
NRS018S	7/13/2015	20-22.5	5.2
NRS018S	7/13/2015	22.5-25	5.4
NRS018S	7/13/2015	25-27.5	5.2
NRS018S	7/13/2015	27.5-30	4.6
NRS018S	7/13/2015	30-32.5	4.4
NRS018S	7/13/2015	32.5-35	4.5
NRS018S	7/13/2015	35-37.5	4.3
NRS018S	7/13/2015	37.5-40	4.6
NRS018S	7/13/2015	40-42.5	4.7
NRS018S	7/13/2015	42.5-45	4.9
NRS018S	7/13/2015	45-47.5	5.1
NRS018S	7/13/2015	47.5-50	6.0
NRS018S	7/13/2015	50-52.5	6.1
NRS018S	7/13/2015	52.5-55	6.4
NRS018S	7/13/2015	55-57.5	7.0
NRS022S	7/21/2015	4-6	6.1
NRS022S	7/21/2015	9-11	5.5
NRS022S	7/21/2015	14-16	3.8
NRS022S	7/21/2015	19-21	4.9
NRS022S	7/21/2015	24-26	4.1
NRS022S	7/21/2015	29-31	4.0
NRS022S	7/21/2015	34-36	4.8
NRS025S	7/7/2015	0-5	6.8
NRS025S	7/7/2015	5-10	6.8
NRS025S	7/7/2015	10-14.3	7.1
NRS025S	7/7/2015	14.3-15	7.0
NRS025S	7/7/2015	16.5-19.1	6.5
NRS025S	7/7/2015	20-21.9	6.4
NRS025S	7/7/2015	21.9-25	5.2
NRS025S	7/7/2015	25-30	6.8
NRS025S	7/7/2015	30-35	4.9
NRS025S	7/7/2015	35-37.6	5.6
NRS025S	7/7/2015	37.6-39.2	6.1
NRS025S	7/7/2015	39.2-40	5.6
NRS025S	7/7/2015	40-43.3	5.4
NRS025S	7/7/2015	43.3-44	5.1
NRS025S	7/7/2015	44-48	5.6
NRS025S	7/7/2015	48-49.5	5.9
NRS025S	7/7/2015	49.5-52	5.9
NRS025S	7/7/2015	52-55	6.6
NRS026S	7/7/2015	0-5	7.0
NRS026S	7/7/2015	5-10	8.4
NRS026S	7/7/2015	10-15	7.5
NRS026S	7/7/2015	20-25	7.2
NRS026S	7/7/2015	25-26.8	8.8
NRS026S	7/7/2015	26.8-29	7.8
NRS029S	7/8/2015	0-5	6.9
NRS029S	7/8/2015	5-8.7	6.4

Table 4-3
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Location ID	Date	Depth Interval (ft bgs)	pH
NRS029S	7/8/2015	8.7-9.5	6.2
NRS029S	7/8/2015	9.5-10	4.8
NRS029S	7/8/2015	10-12	5.6
NRS030S	7/8/2015	0-5	6.4
NRS030S	7/8/2015	7-7.5	6.6
NRS030S	7/8/2015	7.5-8.2	6.5
NRS030S	7/8/2015	8.2-10	6.3
NRS030S	7/8/2015	10-12.5	6.4
NRS030S	7/8/2015	12.5-15	4.3
NRS030S	7/8/2015	15-17.5	4.8
NRS030S	7/8/2015	17.5-20	5.4
NRS030S	7/8/2015	20-21.9	5.8
NRS030S	7/8/2015	21.9-23.5	5.9
NRS030S	7/8/2015	23.5-25	5.9
NRS030S	7/8/2015	25-26.7	6.9
NRS030S	7/8/2015	26.7-30	7.2
NRS033S	7/21/2015	3-5	6.6
NRS033S	7/21/2015	5-7	7.1
NRS033S	7/21/2015	7-9	8.2
NRS033S	7/21/2015	9-11	8.0
NRS033S	7/21/2015	11-13	7.7
NRS033S	7/21/2015	16-18	8.0
NRS033S	7/21/2015	21-23	8.2
NRS035S	7/9/2015	1.8-2.3	7.9
NRS035S	7/9/2015	2.3-4.4	7.1
NRS035S	7/9/2015	7-7.8	4.0
NRS035S	7/9/2015	8-10	4.0
NRS035S	7/9/2015	12-13.5	3.8
NRS035S	7/9/2015	13.5-15	5.4
NRS035S	7/9/2015	15-17.5	6.0
NRS035S	7/9/2015	17.5-20	9.3
NRS035S	7/9/2015	26.5-27.1	8.5
NRS035S	7/9/2015	27.1-30	4.7
NRS035S	7/9/2015	30-32.5	5.0
NRS035S	7/9/2015	32.5-35	4.9
NRS035S	7/14/2015	35-38.2	5.3
NRS035S	7/14/2015	38.2-40	5.4
NRS035S	7/14/2015	40-42.5	5.7
NRS035S	7/14/2015	42.5-45	5.5
NRS035S	7/14/2015	45-49	5.4
NRS035S	7/14/2015	49-50	4.8
NRS035S	7/14/2015	50-54.3	5.3
NRS035S	7/14/2015	54.3-55	5.2
NRS035S	7/14/2015	55-58	5.1
NRS035S	7/14/2015	58-59	5.5
NRS036S	7/9/2015	0-2	7.1
NRS036S	7/9/2015	2-4	4.1
NRS036S	7/9/2015	4-5	4.1
NRS036S	7/9/2015	6.6-7.4	6.2
NRS036S	7/9/2015	7.4-8.1	6.2
NRS036S	7/9/2015	8.1-8.7	6.0
NRS036S	7/9/2015	8.7-10	5.9
NRS036S	7/9/2015	10.2-12.3	5.9

Table 4-3
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Location ID	Date	Depth Interval (ft bgs)	pH
NRS036S	7/9/2015	12.3-13.2	5.7
NRS036S	7/9/2015	13.2-13.9	5.7
NRS036S	7/9/2015	13.9-15	5.8
NRS036S	7/14/2015	15.1-17.1	7.7
NRS036S	7/14/2015	17.1-18.6	7.9
NRS036S	7/14/2015	20-20.8	6.8
NRS036S	7/14/2015	20.8-25	6.2
NRS036S	7/14/2015	25-27.5	7.4
NRS036S	7/14/2015	27.5-30	7.5
NRS036S	7/14/2015	30-30.9	7.7
NRS036S	7/14/2015	30.9-32	6.4
NRS036S	7/14/2015	35-37.5	4.0
NRS036S	7/14/2015	37.5-40	4.1
NRS036S	7/14/2015	40-42	4.2
NRS036S	7/14/2015	42-44	4.0
NRS036S	7/14/2015	44-46	4.2
NRS036S	7/14/2015	46-48	4.2
NRS036S	7/14/2015	48-50	4.0
NRS036S	7/14/2015	50-52	3.9
NRS036S	7/14/2015	52-54.5	3.9
NRS036S	7/14/2015	54.5-56	4.0
NRS036S	7/14/2015	56-57.4	4.1
NRS036S	7/14/2015	57.4-58.4	4.3
NRS036S	7/14/2015	58.4-60	4.7
NRS036S	7/14/2015	60-62	5.0
NRS036S	7/14/2015	62-64	5.0
NRS036S	7/14/2015	64-66	5.2
NRS036S	7/14/2015	66-68	6.1
NRS036S	7/14/2015	68-72	6.0
NRS036S	7/14/2015	72-74	6.9
NRS040S	7/9/2015	0-2.5	5.8
NRS040S	7/9/2015	2.5-5	5.1
NRS040S	7/9/2015	5-7.5	4.1
NRS040S	7/9/2015	7.5-10	6.1
NRS040S	7/9/2015	10-12.5	5.9
NRS040S	7/9/2015	12.5-15	6.5
NRS040S	7/9/2015	15-17.5	6.9
NRS040S	7/9/2015	17.5-20	8.8
NRS040S[a]	7/9/2015	25-27.5	9.9
NRS040S	7/9/2015	28-30	9.9
NRS040S	7/9/2015	30-32.5	5.5
NRS040S	7/9/2015	32.5-33	4.5
NRS043S	7/15/2015	0-4	4.4
NRS043S	7/15/2015	4-5	4.1
NRS043S	7/15/2015	5-7	4.0
NRS043S	7/15/2015	7-10	3.8
NRS043S	7/15/2015	10-13.8	3.8
NRS043S	7/15/2015	13.8-15	7.5
NRS043S	7/15/2015	15-15.7	7.9
NRS043S	7/15/2015	15.7-20	7.6
NRS043S	7/15/2015	20-24.4	9.8
NRS043S	7/15/2015	24.4-25	8.1
NRS043S	7/15/2015	25.9-26.9	8.1

Table 4-3
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Location ID	Date	Depth Interval (ft bgs)	pH
NRS043S	7/15/2015	26.9-30	8.8
NRS043S	7/15/2015	30-32	8.1
NRS043S	7/15/2015	32-35	7.6
NRS043S	7/15/2015	35-37.5	7.9
NRS043S	7/15/2015	37.5-40	7.7
NRS044S	7/9/2015	1.4-2.3	3.9
NRS044S	7/9/2015	2.3-4.6	5.5
NRS044S	7/9/2015	6.7-7.5	2.3
NRS044S	7/9/2015	7.5-9.3	3.4
NRS044S	7/9/2015	9.3-10	3.5
NRS044S	7/9/2015	10-12.5	4.7
NRS044S	7/9/2015	12.5-15	5.2
NRS044S	7/9/2015	15-17.3	6.2
NRS044S	7/9/2015	17.3-18	7.7
NRS044S	7/9/2015	18-21.2	7.8
NRS044S	7/9/2015	22.2-23	8.4
NRS044SA	7/15/2015	28-29	8.6
NRS044SA	7/15/2015	29-30	7.5
NRS044SA	7/15/2015	30-32.5	6.5
NRS044SA	7/15/2015	32.5-35	6.3
NRS044SA	7/15/2015	35-38.7	5.4
NRS044SA	7/15/2015	38.7-40	6.3
NRS044SA	7/15/2015	40-42.3	7.7
NRS044SA	7/15/2015	42.3-45	8.1
NRS044SA	7/15/2015	45-47	7.8
NRS044SA	7/15/2015	47-49	7.7
NRS044SA	7/15/2015	49-51.5	8.0
NRS046S	7/15/2015	0-2.1	4.5
NRS046S	7/15/2015	2.1-4	3.9
NRS046S	7/15/2015	4-5	4.3
NRS046S	7/15/2015	5-6.1	5.1
NRS046S	7/15/2015	6.1-9.1	5.6
NRS046S	7/15/2015	9.1-12.7	5.1
NRS046S	7/15/2015	12.7-13	5.8
NRS046S	7/15/2015	13-16.9	7.5
NRS046S	7/15/2015	16.9-18	7.6
NRS046S	7/15/2015	18-20.7	6.1
NRS046S	7/15/2015	20.7-23	6.2
NRS046S	7/15/2015	23-27	6.0
NRS046S	7/15/2015	27-28.7	5.6
NRS046S	7/15/2015	28.7-32.2	5.2
NRS046S	7/15/2015	32.2-35	4.3
NRS046S	7/15/2015	35-37.5	4.2
NRS046S	7/15/2015	37.5-40	4.1
NRS046S	7/15/2015	40-42.5	4.1
NRS046S	7/15/2015	42.5-45	4.2
NRS046S	7/15/2015	45-47.5	4.1
NRS046S	7/15/2015	47.5-50	4.0
NRS046S	7/15/2015	50-52.5	4.2
NRS046S	7/15/2015	52.5-55	4.4
NRS046S	7/15/2015	55-57.5	4.6
NRS046S	7/15/2015	57.5-60	5.3
NRS046S	7/15/2015	60-62.5	6.1

Table 4-3
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Location ID	Date	Depth Interval (ft bgs)	pH
NRS046S	7/15/2015	62.5-65	6.1
NRS046S	7/15/2015	65-67.5	6.5
NRS046S	7/15/2015	67.5-70	6.1
NRS046S	7/15/2015	70-75	7.8
NRS046S[b]	7/15/2015	75-76A	7.6
NRS046S[b]	7/15/2015	75-76B	7.8
NRS047SA	7/16/2015	0-1.9	5.7
NRS047SA	7/16/2015	1.9-3.5	4.3
NRS047SA	7/16/2015	3.5-5	4.4
NRS047SC	7/16/2015	2.5-5	6.5
NRS047SD	7/16/2015	0-2.3	6.7
NRS047SD	7/16/2015	2.3-5	4.9
NRS048S	7/16/2015	4-5.5	4.5
NRS048S	7/16/2015	5.5-6	5.5
NRS048S	7/16/2015	9-11	4.7
NRS048S	7/16/2015	14-16	6.3
NRS048S	7/16/2015	19-21	6.4
NRS048S	7/16/2015	24-26	6.2
NRS048S	7/16/2015	29-31	6.0
NRS048S	7/16/2015	34-36	5.1
NRS048S	7/16/2015	39-41	4.6
NRS048S	7/16/2015	44-46	4.7
NRS048S	7/16/2015	49-51	4.5
NRS048S	7/16/2015	54-56	5.0
NRS048S	7/17/2015	59-61	5.1
NRS048S	7/17/2015	64-66	5.4
NRS048S	7/17/2015	69-71	6.1
NRS049S	7/17/2015	4-6	5.7
NRS049S	7/17/2015	9-11	5.1
NRS049S	7/17/2015	14-16	4.5
NRS049S	7/17/2015	19-21	4.5
NRS049S	7/17/2015	24-25	5.2
NRS049S	7/17/2015	29-31	6.2
NRS049S	7/17/2015	34-36	6.7
NRS049S	7/17/2015	39-41	6.3
NRS049S	7/17/2015	44-46	6.0
NRS049S	7/17/2015	49-51	6.1
NRS049S	7/17/2015	54-56	8.2
NRS050S	7/18/2015	4-6	5.1
NRS050S	7/18/2015	9-11	4.5
NRS050S	7/18/2015	14-16	4.6
NRS050S	7/18/2015	19-21	5.9
NRS050S	7/18/2015	24-26	6.9
NRS050S	7/18/2015	29-30	7.0
NRS050S	7/18/2015	30-31	6.4
NRS050S	7/18/2015	34-36	6.2
NRS050S	7/18/2015	39-41	5.4
NRS050S	7/18/2015	44-46	5.8
NRS050S	7/18/2015	49-51	5.9
NRS050S	7/18/2015	54-56	6.4
NRS050S	7/18/2015	60-62	6.4
NRS050S	7/18/2015	64-64.25	7.5

Table 4-3
Field Soil pH Results for 2015 and 2020 Investigations
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Location ID	Date	Depth Interval (ft bgs)	pH
NRS051	1/30/2020	0-5	4.3
NRS051	1/30/2020	5-10	3.8
NRS051	1/30/2020	10-15	3.9
NRS051	1/30/2020	15-20	4.2
NRS051	1/30/2020	20-25	4.4
NRS051	1/30/2020	25-30	5.1
NRS051	1/30/2020	30-35	7.1
NRS051	1/30/2020	35-39	8.5
NRS052	1/30/2020	0-5	3.6
NRS052	1/30/2020	5-10	3.9
NRS052	1/30/2020	10-15	4.3
NRS052	1/30/2020	15-20	4.8
NRS052	1/30/2020	20-25	5.3
NRS052	1/30/2020	25-30	6.9
NRS052	1/30/2020	30-35	7.1
NRS052	1/30/2020	35-40	7.5
NRS052	1/30/2020	40-45	6.3
NRS052	1/30/2020	45-50	4.9
NRS052	1/30/2020	50-55	6.3
NRS052	1/30/2020	55-60	6.2
NRS052	1/30/2020	60-65	7.6
NRS053	1/29/2020	0-5	3.2
NRS053	1/29/2020	5-10	4.1
NRS053	1/29/2020	10-15	4.1
NRS053	1/29/2020	15-20	4.8
NRS053	1/29/2020	20-25	5.9
NRS053	1/29/2020	25-30	5.6
NRS053	1/29/2020	30-35	7.0
NRS053	1/29/2020	35-40	4.9
NRS053	1/29/2020	40-45	4.7
NRS053	1/29/2020	45-50	4.4
NRS053	1/29/2020	50-55	4.5
NRS053	1/29/2020	55-60	4.5
NRS053	1/29/2020	60-65	4.5
NRS053	1/29/2020	65-70	6.1
NRS053	1/30/2020	70-72	8.0
NRS054	1/28/2020	0-5	6.1
NRS054	1/28/2020	5-10	4.0
NRS054	1/28/2020	10-15	3.9
NRS054	1/28/2020	15-20	4.6
NRS054	1/28/2020	20-25	5.6
NRS054	1/28/2020	25-30	5.8
NRS054	1/28/2020	30-35	6.7
NRS054	1/29/2020	35-40	5.0
NRS054	1/29/2020	40-45	4.1
NRS054	1/29/2020	45-50	4.1
NRS054	1/29/2020	50-55	4.2
NRS054	1/29/2020	55-60	4.5
NRS054	1/29/2020	60-65	5.7
NRS054	1/29/2020	65-66	7.6
NRS055	1/28/2020	0-5	4.3
NRS055	1/28/2020	5-10	4.1
NRS055	1/28/2020	10-15	4.1

Table 4-3
Field Soil pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Location ID	Date	Depth Interval (ft bgs)	pH
NRS055	1/28/2020	15-20	4.4
NRS055	1/28/2020	20-25	5.3
NRS055	1/28/2020	25-30	5.9
NRS055	1/28/2020	30-35	4.8
NRS055	1/28/2020	35-40	4.7
NRS055	1/28/2020	40-45	4.7
NRS055	1/28/2020	45-50	4.4
NRS055	1/28/2020	50-55	4.3
NRS055	1/28/2020	55-59	5.0
NRS055	1/28/2020	59-60	4.5
NRS055	1/28/2020	60-65	4.6
NRS055	1/28/2020	65-70	7.0
NRS056	1/27/2020	0-5	7.0
NRS056	1/27/2020	5-10	4.2
NRS056	1/27/2020	10-15	4.3
NRS056	1/27/2020	15-20	4.3
NRS056	1/27/2020	20-25	5.2
NRS056	1/27/2020	25-30	5.6
NRS056	1/27/2020	30-35	5.4
NRS056	1/27/2020	35-40	6.2
NRS056	1/27/2020	40-45	5.8
NRS056	1/27/2020	45-50	7.3
NRS056	1/27/2020	50-55	7.2
NRS056	1/27/2020	55-60	7.3
NRS056	1/27/2020	60-65	7.3
NRS057	2/3/2020	0-5	6.7
NRS057	2/3/2020	5-10	3.9
NRS057	2/3/2020	10-15	6.7
NRS057	2/3/2020	15-20	5.4
NRS057	2/3/2020	20-25	5.1
NRS057	2/3/2020	25-30	5.4
NRS057	2/3/2020	30-35	5.2
NRS057	2/3/2020	35-40	4.5
NRS057	2/3/2020	40-45	4.4
NRS057	2/3/2020	45-50	4.5
NRS057	2/3/2020	50-55	4.9
NRS057	2/4/2020	55-60	4.3
NRS057	2/4/2020	60-65	5.7
NRS057	2/4/2020	65-70	5.4
NRS058	2/3/2020	0-5	7.7
NRS058	2/3/2020	5-10	6.8
NRS058	2/3/2020	10-15	4.4
NRS058	2/3/2020	15-20	6.2
NRS058	2/3/2020	20-25	5.9
NRS058	2/3/2020	25-30	4.2
NRS058	2/3/2020	30-35	4.5
NRS058	2/3/2020	35-40	5.2
NRS058	2/3/2020	40-45	4.5
NRS058	2/3/2020	45-50	4.7
NRS058	2/3/2020	50-55	4.9
NRS058	2/3/2020	55-60	4.5
NRS058	2/3/2020	60-63.5	5.3
NRS059	2/4/2020	0-5	7.5

Table 4-3
Field Soil pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
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Location ID	Date	Depth Interval (ft bgs)	pH
NRS059	2/4/2020	5-10	6.7
NRS059	2/4/2020	10-15	7.1
NRS059	2/4/2020	15-20	7.6
NRS059	2/4/2020	20-25	7.7
NRS059	2/4/2020	25-30	7.6
NRS059	2/4/2020	30-35	7.4
NRS059	2/4/2020	35-40	7.4
NRS059	2/4/2020	40-45	7.3
NRS059	2/4/2020	45-45.5	7.4
NRS060	1/31/2020	0-5	5.1
NRS060	1/31/2020	5-10	4.4
NRS060	1/31/2020	10-15	5.0
NRS060	1/31/2020	15-20	5.7
NRS060	1/31/2020	20-25	5.0
NRS060	1/31/2020	25-30	4.9
NRS060	1/31/2020	30-35	4.6
NRS060	1/31/2020	35-50	4.7
NRS060	1/31/2020	50-55	5.1
NRS060	1/31/2020	55-60	4.4
NRS060	1/31/2020	60-65	4.5
NRS061	1/31/2020	0-5	7.2
NRS061	1/31/2020	5-10	5.5
NRS061	1/31/2020	10-15	6.0
NRS061	1/31/2020	15-20	4.8
NRS061	1/31/2020	20-25	5.6
NRS061	1/31/2020	25-30	5.2
NRS061	1/31/2020	30-35	5.7
NRS061	1/31/2020	35-40	6.4
NRS061	1/31/2020	40-42.5	7.0
NRS062	1/31/2020	0-5	3.8
NRS062	1/31/2020	5-10	6.1
NRS062	1/31/2020	10-15	5.8
NRS062	1/31/2020	15-20	6.7
NRS062	1/31/2020	20-25	6.6
NRS062	1/31/2020	25-30	7.3
NRS062	1/31/2020	30-33	7.4
NRS064	2/4/2020	0-5	7.7
NRS064	2/4/2020	5-10	6.7
NRS064	2/4/2020	10-15	8.9
NRS064	2/4/2020	15-20	10.1
NRS064	2/4/2020	20-25	9.8
NRS064	2/4/2020	25-30	9.3
NRS064	2/4/2020	30-35	9.1
NRS064	2/4/2020	35-40	9.0
NRS064	2/4/2020	40-45	8.7
NRS064	2/4/2020	45-48	8.7
NRS065	2/4/2020	0-5	5.1
NRS065	2/4/2020	5-10	4.6
NRS065	2/4/2020	10-15	4.6
NRS065	2/4/2020	15-20	4.7
NRS065	2/4/2020	20-25	5.0
NRS065	2/4/2020	25-30	5.5
NRS065	2/4/2020	30-35	5.9

Table 4-3
Field Soil pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Location ID	Date	Depth Interval (ft bgs)	pH
NRS065	2/4/2020	35-40	6.0
NRS065	2/4/2020	40-45	6.4
NRS065	2/4/2020	45-47.5	6.7
NRS067	1/31/2020	0-5	7.2
NRS067	1/31/2020	5-10	4.4
NRS067	1/31/2020	10-15	4.3
NRS067	1/31/2020	15-20	4.3
NRS067	1/31/2020	20-25	5.7
NRS067	1/31/2020	25-30	6.0
NRS067	1/31/2020	30-35	7.4

Notes:
[a]Boring logs suggest material sampled may be slough
[b]Unknown provenance of recovery
Date shown is the date of analysis
Sample Location IDs ending in "S" (e.g., NRSxxxS) denotes a step- off boring advanced a few feet from the original boring.
ft bgs = feet below ground surface
Gray shaded cells indicate that at least a portion of the sample inerval was CCR.

Table 4-4
Soil Acid Base Accounting and Laboratory pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Sample ID	Sample Interval (feet bgs)	Total Moisture (%)	Laboratory pH	Sulfur, Total (%wt)	Sulfur, Sulfate (%wt)	Sulfur, Pyritic (%wt)	Sulfur, Residual (%wt)	AGP (t CaCO3/ 1000t)	ANP (t CaCO3/ 1000t)	NANP $_{Tot}$ (t CaCO3/ 1000t)	NPR (Calc NP/AP)
2015 Investigation											
NRS001S	0-5	29.8	N/A	0.04	0.04	0.01 U	0.01	1	2	**1**	1
	5-10	15.3	N/A	0.05	0.05	0.01 U	0.01 U	2	1	**-1**	1
	10-15	15.9	N/A	0.04	0.04	0.01 U	0.01	1	0	**-1**	0
	15-20	15.9	N/A	0.04	0.01 U	0.02	0.02	1	1	**0**	1
	20-25	23.3	N/A	0.02	0.02	0.01 U	0.01	1	1	**0**	1
	25-30	16.6	N/A	0.06	0.06	0.01 U	0.01	2	0	**-2**	0
	30-35	24.4	N/A	0.06	0.05	0.01 U	0.02	2	0	**-2**	0
	43-45	40.0	N/A	0.10	0.08	0.01 U	0.02	3	2	**-1**	1
	45-50	25.1	N/A	0.08	0.08	0.01 U	0.02	3	0	**-3**	0
NRS002S	25-28	15.7	N/A	0.08	0.08	0.01 U	0.01	3	0	**-3**	0
	33-38	18.7	N/A	0.02	0.01	0.01 U	0.01	1	0	**-1**	0
	48-53	18.2	N/A	0.02	0.01	0.01 U	0.01	1	1	**0**	2
	53-56.5	25.1	N/A	0.01	0.01	0.01 U	0.01	0	5	**5**	11
NRS008S	0-1.3	16.2	N/A	0.07	0.01 U	0.03	0.05	2	117	**115**	53
	6.1-8.0	16.7	N/A	0.24	0.02	0.17	0.05	8	3	**-5**	0
	8-10	8.1	N/A	0.61	0.10	0.42	0.09	19	2	**-17**	0
	12.2-13.6	9.0	N/A	0.55	0.01	0.45	0.09	17	26	9	**2**
	13.6-15	15.8	N/A	0.25	0.01 U	0.23	0.06	8	26	**18**	3
	25-27.5	31.8	N/A	0.29	0.18	0.06	0.05	9	8	**-1**	1
	55.7-57	17.7	N/A	0.04	0.03	0.01 U	0.01 U	1	0	**-1**	0
	59-61	16.7	N/A	0.04	0.03	0.01 U	0.02	1	0	**-1**	0
	83-85	38.1	N/A	0.02	0.01 U	0.01	0.01	1	35	**34**	39
NRS012S	20-22.5	16.4	N/A	0.02	0.01	0.01 U	0.01	1	1	**0**	2
	22.5-25	15.8	N/A	0.04	0.03	0.01 U	0.01	1	0	**-1**	0
	25-27.5	14.4	N/A	0.03	0.02	0.01 U	0.01	1	0	**-1**	0
	37.5-40	14.2	N/A	0.01 U	0.01 U	0.01 U	0.01 U	0	0	**0**	0
	42.5-45	21.1	N/A	0.01 U	0.01 U	0.01	0.01 U	0	1	**1**	3
	47.5-50	39.7	N/A	0.01 U	0.01 U	0.01	0.01 U	0	2	**2**	6
NRS017S	5-7.5	15.6	N/A	0.09	0.08	0.01 U	0.02	3	0	**-3**	0
	16.5-17.5	17.6	N/A	0.42	0.01 U	0.37	0.06	13	4	**-9**	0
	18.5-20	20.8	N/A	0.46	0.45	0.01 U	0.01 U	14	0	**-14**	0
	26-27.5	15.6	N/A	0.02	0.01	0.01 U	0.01	1	0	**-1**	0
	30-32.5	21.2	N/A	0.04	0.02	0.01 U	0.03	1	0	**-1**	0
	40-42.5	29.9	N/A	0.05	0.03	0.01 U	0.02	2	0	**-2**	0
NRS018S	2.5-5	15.4	N/A	0.53	0.40	0.04	0.10	17	0	**-17**	0
	5-7.5	14.2	N/A	2.16	1.65	0.29	0.22	68	0	**-68**	0
	7.5-10	15.6	N/A	0.12	0.09	0.01	0.02	4	0	**-4**	0
	10-12.5	21.6	N/A	0.10	0.07	0.01	0.02	3	0	**-3**	0
	17.5-20	15.7	N/A	0.01	0.01 U	0.01	0.01	0	2	**2**	6
	35-37.5	17.9	N/A	0.05	0.03	0.01	0.01	2	0	**-2**	0
	52.5-55	23.6	N/A	0.01	0.01 U	0.01	0.01	0	0	**0**	0

Table 4-4
Soil Acid Base Accounting and Laboratory pH Results for 2015 and 2020 Investigations
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Sample ID	Sample Interval (feet bgs)	Total Moisture (%)	Laboratory pH	Sulfur, Total (%wt)	Sulfur, Sulfate (%wt)	Sulfur, Pyritic (%wt)	Sulfur, Residual (%wt)	AGP (t CaCO3/ 1000t)	ANP (t CaCO3/ 1000t)	NANP $_{Tot}$ (t CaCO3/ 1000t)	NPR (Calc NP/AP)
NRS022S	4-6	14.8	N/A	0.08	0.06	0.01 U	0.03	2	11	**9**	5
	9-11	16.0	N/A	0.04	0.03	0.01 U	0.01	1	0	**-1**	0
	14-16	15.1	N/A	0.13	0.12	0.01 U	0.02	4	0	**-4**	0
	19-21a	15.9	N/A	0.05	0.03	0.01 U	0.01	1	0	**-1**	0
	19-21b	18.4	N/A	0.11	0.09	0.01 U	0.02	3	0	**-3**	0
	29-31	17.6	N/A	0.11	0.10	0.01 U	0.03	4	0	**-4**	0
	34-36	17.0	N/A	0.05	0.03	0.01 U	0.02	2	0	**-2**	0
NRS025S	0-5	34.9	N/A	0.09	0.03	0.01 U	0.07	3	25	**22**	9
	10-14.3	17.4	N/A	0.02	0.02	0.01 U	0.01 U	1	3	**2**	5
	25-30	32.0	N/A	0.14	0.03	0.06	0.04	4	19	**15**	4
	30-35	26.8	N/A	0.04	0.04	0.01 U	0.01	1	1	**0**	1
	43.3-44	31.1	N/A	0.01 U	0.01 U	0.01 U	0.01 U	0	1	**1**	3
NRS026S	25-26.8	38.5	N/A	0.23	0.10	0.10	0.03	7	95	**88**	13
	26.8-29	29.7	N/A	0.02	0.01	0.01 U	0.01	1	4	**3**	7
NRS029S	9.5-10	46.5	N/A	0.03	0.03	0.01 U	0.02	1	0	**-1**	0
NRS030S	10-12.5	19.2	N/A	0.04	0.03	0.01 U	0.01	1	0	**-1**	0
	12.5-15	20.4	N/A	0.04	0.03	0.01 U	0.01	1	0	**-1**	0
	17.5-20	20.5	N/A	0.02	0.02	0.01 U	0.01	1	1	**0**	1
	21.9-23.5	19.1	N/A	0.01	0.01 U	0.01	0.01 U	0	5	**5**	28
	23.5-25	18.1	N/A	0.01	0.01 U	0.01	0.01 U	0	11	**11**	43
	26.7-30	20.3	N/A	0.01	0.01	0.01 U	0.01 U	0	24	**24**	68
NRS033S	5-7	12.0	N/A	0.35	0.02	0.19	0.14	11	247	236	**23**
	16-18	15.7	N/A	0.02	0.01	0.01 U	0.01	1	196	**195**	196
NRS035S	12-13.5	14.5	N/A	0.53	0.29	0.18	0.06	17	0	**-17**	0
	15-17.5	31.4	N/A	0.09	0.01	0.04	0.04	3	31	**28**	11
	17.5-20	33.4	N/A	0.15	0.07	0.04	0.04	5	28	**23**	6
	26.5-27.1	14.6	N/A	0.58	0.15	0.38	0.05	18	9	**-9**	0
	27.1-30	16.9	N/A	0.05	0.05	0.01	0.01 U	2	1	**-1**	1
	32.5-35	18.0	N/A	0.03	0.03	0.01 U	0.01	1	2	**1**	2
	42.5-45	17.7	N/A	0.01 U	0.01 U	0.01	0.01 U	0	0	**0**	0
	49-50	17.8	N/A	0.01	0.01 U	0.01 U	0.01 U	0	1	**1**	3
NRS036S	0-2	16.1	N/A	2.31	1.40	0.64	0.28	72	106	34	**1**
	4-5	14.7	N/A	4.23	0.33	3.72	0.18	132	0	**-132**	0
	6.6-7.4	15.4	N/A	3.44	1.29	1.98	0.16	108	1	**-107**	0
	8.7-10	14.8	N/A	2.60	0.55	1.79	0.25	81	7	**-74**	0
	20.8-25	26.5	N/A	0.44	0.31	0.07	0.06	14	5	**-9**	0
	35-37.5	18.9	N/A	0.19	0.16	0.01 U	0.04	6	0	**-6**	0
	52-54.5	18.4	N/A	0.13	0.12	0.01 U	0.02	4	0	**-4**	0
	54.5-56	17.8	N/A	0.10	0.10	0.01 U	0.02	3	0	**-3**	0
	57.4-58.4	18.2	N/A	0.07	0.06	0.01 U	0.02	2	0	**-2**	0
	58.4-60	17.4	N/A	0.04	0.03	0.01 U	0.01	1	0	**-1**	0

Table 4-4
Soil Acid Base Accounting and Laboratory pH Results for 2015 and 2020 Investigations
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TVA Gallatin Fossil Plant, Gallatin, Tennessee

Sample ID	Sample Interval (feet bgs)	Total Moisture (%)	Laboratory pH	Sulfur, Total (%wt)	Sulfur, Sulfate (%wt)	Sulfur, Pyritic (%wt)	Sulfur, Residual (%wt)	AGP (t CaCO3/ 1000t)	ANP (t CaCO3/ 1000t)	NANP $_{Tot}$ (t CaCO3/ 1000t)	NPR (Calc NP/AP)
NRS040S	5-7.5	9.4	N/A	1.84	0.56	1.18	0.11	58	7	**-51**	0
	7.5-10	10.1	N/A	1.23	0.34	0.73	0.16	38	13	-25	**0**
	12.5-17.5	36.7	N/A	0.44	0.14	0.23	0.07	14	20	6	**1**
	27.5-30	40.6	N/A	0.39	0.22	0.12	0.05	12	34	22	**3**
	30-32.5	27.4	N/A	0.03	0.02	0.01 U	0.01 U	1	1	**0**	1
	32.5-33	11.9	N/A	0.04	0.03	0.01 U	0.01	1	0	**-1**	0
NRS043S	0-4	14.5	N/A	1.01	0.74	0.01 U	0.68	32	1	**-30**	0
	10-13.8	27.8	N/A	0.85	0.73	0.08	0.03	26	0	**-26**	0
	13.8-15	25.6	N/A	0.20	0.04	0.13	0.03	6	21	**15**	3
	20-24.4	36.4	N/A	0.18	0.12	0.04	0.03	6	67	**61**	12
	25.9-26.9	20.4	N/A	0.14	0.09	0.01 U	0.07	5	12	**8**	2
NRS044S	1.4-2.3	21.7	N/A	0.37	0.33	0.01 U	0.08	12	0	**-12**	0
	2.3-4.6	30.3	N/A	0.88	0.81	0.01 U	0.08	27	0	**-27**	0
	6.7-7.5	27.0	N/A	1.14	1.12	0.01 U	0.10	36	0	**-36**	0
	7.5-9.3	21.8	N/A	0.88	0.77	0.03	0.07	27	0	**-27**	0
	9.3-10	20.7	N/A	0.84	0.67	0.10	0.07	26	0	**-26**	0
	10-12.5	19.3	N/A	0.07	0.07	0.01 U	0.01	2	0	**-2**	0
	15-17.3	24.7	N/A	0.01	0.01 U	0.01 U	0.01	0	31	**31**	94
	17.3-18	31.0	N/A	0.01	0.01	0.01 U	0.01 U	0	540	**540**	1274
NRS044SA	35-38.7	22.4	N/A	0.05	0.04	0.01 U	0.02	2	0	**-2**	0
	47-49	22.7	N/A	0.01	0.01 U	0.01 U	0.02	0	5	**5**	16
NRS046S	2.1-4	16.9	N/A	1.50	0.82	0.47	0.22	47	0	**-47**	0
	6.1-9.1	26.3	N/A	0.41	0.23	0.13	0.05	13	0	**-13**	0
	23-27	27.0	N/A	0.42	0.32	0.07	0.03	13	4	**-9**	0
	37.5-40	16.4	N/A	0.15	0.14	0.01 U	0.02	5	0	**-5**	0
	47.5-50	15.7	N/A	0.10	0.09	0.01 U	0.01	3	0	**-3**	0
	75-76B	29.3	N/A	0.03	0.01 U	0.01 U	0.03	1	85	**84**	87
NRS047SA	1.9-3.5	13.2	N/A	0.68	0.39	0.08	0.21	21	0	**-21**	0
NRS047SD	2.3-5	8.2	N/A	1.32	0.94	0.17	0.20	41	0	**-41**	0
NRS048S	5.5-6	12.9	N/A	1.60	0.22	1.19	0.20	50	5	**-45**	0
	9-11	16.4	N/A	0.10	0.07	0.01 U	0.03	3	0	**-3**	0
	39-41	17.9	N/A	0.05	0.04	0.01 U	0.01 U	2	0	**-2**	0
	49-51	22.2	N/A	0.05	0.03	0.01 U	0.02	2	0	**-2**	0
	69-71	25.0	N/A	0.02	0.01	0.01 U	0.02	1	2	**1**	3
NRS049S	4-6	16.3	N/A	0.02	0.01	0.01 U	0.02	1	4	**3**	5
	19-21	17.2	N/A	0.11	0.09	0.01	0.02	3	0	**-3**	0
	44-46	17.0	N/A	0.02	0.01	0.01 U	0.01	1	1	**0**	2
NRS050S	4-6	19.5	N/A	0.76	0.69	0.01 U	0.17	24	3	**-21**	0
	9-11	19.9	N/A	2.03	0.01 U	1.78	0.25	63	1	**-62**	0
	29-30	35.0	N/A	0.86	0.01 U	0.73	0.18	27	55	28	**2**
	39-41	17.0	N/A	0.04	0.02	0.01 U	0.01	1	0	**-1**	0
	49-51	50.4	N/A	0.04	0.03	0.01 U	0.01	1	0	**-1**	0

Table 4-4
Soil Acid Base Accounting and Laboratory pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Sample ID	Sample Interval (feet bgs)	Total Moisture (%)	Laboratory pH	Sulfur, Total (%wt)	Sulfur, Sulfate (%wt)	Sulfur, Pyritic (%wt)	Sulfur, Residual (%wt)	AGP (t CaCO3/ 1000t)	ANP (t CaCO3/ 1000t)	NANP $_{Tot}$ (t CaCO3/ 1000t)	NPR (Calc NP/AP)
2020 Investigation											
NRS051	15-20	14.0	3.86	0.13	0.09	0.03 U	0.03	4	-3	**-7**	-1
	35-39	15.4	7.22	0.10	0.05	0.03 U	0.04	3	148	**145**	47
NRS052	25-30	18.6	7.58	0.03	0.03 U	0.03	0.03 U	1	101	**100**	107
	45-50	24.7	4.02	0.08	0.05	0.03 U	0.03	3	-2	**-4**	-1
NRS053	45-50	20.6	3.85	0.08	0.08	0.03 U	0.03	3	-2	**-4**	-1
	70-72	25.2	7.46	0.04	0.04	0.03 U	0.03 U	1	114	**113**	91
NRS054	10-15	16.0	3.57	0.14	0.10	0.03 U	0.04	4	-4	**-8**	-1
	64-65	16.9	4.93	0.03 U	0.03 U	0.03 U	0.03 U	1	2	**1**	2
NRS055	10-15	16.1	3.49	0.17	0.12	0.03 U	0.05	5	-5	**-10**	-1
	59-60	16.4	3.87	0.17	0.05	0.03 U	0.03 U	5	0	**-5**	0
NRS056	5-10	17.5	3.18	0.21	0.13	0.03 U	0.07	7	-8	**-14**	-1
	40-45	17.3	4.35	0.03	0.03	0.03 U	0.03 U	1	1	**0**	1
NRS057	20-25	18.4	4.65	0.21	0.21	0.03 U	0.04	7	1	**-6**	0
	30-35	15.0	3.82	0.06	0.06	0.03 U	0.03 U	2	0	**-2**	0
	35-40	15.8	3.77	0.05	0.05	0.03 U	0.03 U	2	6	**5**	4
	40-45	19.0	4.24	0.08	0.08	0.03 U	0.03	3	-5	**-8**	-2
	55-60	17.1	6.51	0.03 U	0.03 U	0.03 U	0.03 U	1	3	**3**	4
	65-70	20.1	7.67	0.03 U	0.03 U	0.03 U	0.03 U	1	12	**11**	13
NRS058	0-5	13.4	7.39	0.08	0.04	0.03 U	0.04	3	35	**33**	14
	10-15	11.9	3.98	3.42	2.52	0.03 U	0.89	107	1	**-106**	0
	20-25	12.2	4.57	4.24	1.09	3.02	0.13	133	19	-114	**0**
	40-45	20.5	4.55	0.03 U	0.03 U	0.03 U	0.03 U	1	2	**1**	2
	45-50	22.5	4.86	0.03 U	0.03 U	0.03 U	0.03 U	1	2	**1**	2
	55-60	18.7	4.68	0.03 U	0.03 U	0.03 U	0.03 U	1	1	**0**	1
NRS059	0-5	22.7	7.09	0.03	0.03	0.03 U	0.03 U	1	9	**8**	9
	5-10	15.2	6.98	0.03 U	0.03 U	0.03 U	0.03 U	1	5	**4**	5
	25-30	20.7	8.04	0.03 U	0.03 U	0.03 U	0.03 U	1	24	**23**	25
	30-35	16.6	7.61	0.03 U	0.03 U	0.03 U	0.03 U	1	10	**9**	10
	35-40	20.3	7.65	0.03 U	0.03 U	0.03 U	0.03 U	1	10	**9**	11
	40-45	31.5	7.76	0.03 U	0.03 U	0.03 U	0.03 U	1	17	**16**	19
NRS060	0-5	17.0	3.39	3.13	2.20	0.78	0.15	98	-8	**-106**	0
	5-10	22.9	3.88	3.11	1.51	1.37	0.24	97	1	**-96**	0
	15-20	18.0	4.37	2.68	1.50	0.98	0.20	84	1	**-83**	0
	20-25	17.7	4.25	0.18	0.18	0.03 U	0.04	6	0	**-6**	0
	25-30	17.6	3.36	0.11	0.08	0.03	0.03 U	3	-2	**-5**	0
	30-35	18.1	3.10	0.13	0.07	0.06	0.03 U	4	-4	**-8**	-1

Table 4-4
Soil Acid Base Accounting and Laboratory pH Results for 2015 and 2020 Investigations
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Sample ID	Sample Interval (feet bgs)	Total Moisture (%)	Laboratory pH	Sulfur, Total (%wt)	Sulfur, Sulfate (%wt)	Sulfur, Pyritic (%wt)	Sulfur, Residual (%wt)	AGP (t CaCO3/ 1000t)	ANP (t CaCO3/ 1000t)	NANP $_{Tot}$ (t CaCO3/ 1000t)	NPR (Calc NP/AP)
NRS061	0-5	17.7	7.53	0.20	0.11	0.03 U	0.10	6	90	**83**	14
	5-10	16.1	4.64	2.79	2.06	0.53	0.20	87	0	**-87**	0
	15-20	22.3	4.45	0.88	0.55	0.20	0.13	28	3	**-24**	0
	20-25	22.6	5.45	0.03 U	0.03 U	0.03	0.03 U	1	0	**0**	0
	30-35	23.3	5.15	0.03 U	0.03 U	0.03 U	0.03	1	1	**0**	1
	35-40	33.5	5.43	0.03 U	0.03 U	0.03 U	0.03	1	3	**2**	3
NRS062	0-5	23.8	4.31	5.58	5.35	0.03 U	0.50	174	-4	**-178**	0
	5-10	18.8	5.85	1.10	1.05	0.03 U	0.07	35	10	**-24**	0
	15-20	22.3	6.47	0.03	0.03 U	0.03 U	0.03	1	3	**2**	3
	20-25	17.4	6.56	0.03 U	0.03 U	0.03 U	0.03	1	2	**1**	2
	25-30	22.3	6.81	0.03 U	0.03 U	0.03 U	0.03	1	24	**23**	26
	30-33	22.6	7.84	0.03	0.03	0.03 U	0.03	1	119	**119**	149
NRS064	0-5	15.5	6.34	2.33	1.01	1.40	0.03 U	73	9	**-63**	0
	5-10	20.5	4.85	0.22	0.03 U	1.53	0.04	7	4	**-3**	1
	15-20	30.0	9.95	0.16	0.13	0.03 U	0.04	5	42	**37**	8
	25-30	17.5	5.71	0.04	0.04	0.03 U	0.03 U	1	2	**1**	2
	35-40	17.3	6.73	0.03 U	0.03 U	0.03 U	0.03 U	1	1	**0**	1
	40-45	16.3	6.67	0.03 U	0.03 U	0.03 U	0.03 U	1	2	**1**	2
NRS065	5-10	17.0	4.25	0.03 U	0.03 U	0.03 U	0.03 U	1	-1	**-2**	-1
	15-20	18.5	4.29	0.03 U	0.03 U	0.03 U	0.03 U	1	-1	**-2**	-1
	25-30	19.0	5.94	0.03	0.03	0.03 U	0.03 U	1	1	**1**	2
	30-35	17.3	6.67	0.03	0.03	0.03 U	0.03	1	2	**1**	2
	35-40	22.6	5.66	0.03	0.03	0.03 U	0.03 U	1	3	**2**	3
	45-47.5	27.6	7.61	0.03 U	0.03 U	0.03 U	0.03 U	1	15	**14**	16
NRS067	5-10	16.6	3.64	0.12	0.07	0.03 U	0.05	4	-3	**-7**	-1
	30-35	16.2	7.45	0.06	0.03 U	0.03 U	0.04	2	78	**77**	42
	40-58	17.6	3.93	0.06	0.06	0.03 U	0.03 U	2	0	**-2**	0
NRS068 (GAF-526U)	57-60	21.5	5.02	0.10	0.05	0.03 U	0.03	3	2	**-2**	1
NRS069 (GAF-541U)	40-50	18.5	6.24	0.11	0.11	0.03 U	0.03 U	3	3	**-1**	1
NRS070 (GAF-444U)	50-60	26.3	5.63	0.07	0.09	0.03 U	0.03 U	2	4	**2**	2

Notes:

%wt = Percent weight
% = Percent
< = Not detected above reporting limit shown
AGP = Acid Generation Potential
ANP = Acid neutralization Potential (Neutralization Potential in the laboratory report)
N/A = Not analyzed
NANP = Net acid neutralization potential (Acid=Base Potential in the laboratory report)
t CaCO3/1000t = tons calcium carbonate per 1,000 tons of soil
tot = Total

U = Not detected above reporting limit shown

Bold value indicates more reliable acid generating indicator
Gray shaded cells indicate that at least a portion of the sample interval was CCR.
Non-acid generating
Potentially acid generating
Uncertain

Table 4-5
Soil Chemical Results for 2020 Field Investigation
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

				Parameter	Aluminum		Antimony		Arsenic		Barium		Beryllium		Boron		Cadmium		Calcium	
				Unit	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Location ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Sample Type	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers
NRS 051	GAF-SB-903-01302020	15-20	1/30/2020	FD	17200		0.259	J	7.02		48.2		0.594		3.49	J	< 0.0186	U	495	J
NRS 051	GAF-SB-NRS051-15-20-01302020	15-20	1/30/2020	N	15600		0.369	J	7.30		70.6		0.579		2.77	J	0.0200	J	775	J
NRS 051	GAF-SB-NRS051-35-39-01302020	35-39	1/30/2020	N	8920		0.119	J	4.07		66.4		0.899		6.09	J	0.122		124000	
NRS 052	GAF-SB-NRS052-25-30-01302020	25-30	1/30/2020	N	12600		0.239	J	7.41		101		1.30		4.57	J	0.231		18500	
NRS 052	GAF-SB-NRS052-45-50-01302020	45-50	1/30/2020	N	14200		0.334	J	9.45		55.4		1.08		12.1	J	0.0407	J	1100	
NRS 053	GAF-SB-NRS053-45-50-01292020	45-50	1/29/2020	N	12400		0.351	J	20.0		41.6		1.64		8.44	J	0.113		771	
NRS 053	GAF-SB-NRS053-70-72-01302020	70-72	1/30/2020	N	9340		0.149	J	5.33		93.8		1.24		10.0	J	0.557		16700	
NRS 054	GAF-SB-NRS054-10-15-01282020	10-15	1/28/2020	N	13100		0.254	J	6.39		38.8		0.522		3.19	J	3.01		540	
NRS 054	GAF-SB-NRS054-65-66-01292020	65-66	1/29/2020	N	12900		0.204	J	9.44		140		1.70		7.92	J	1.34		70400	
NRS 055	GAF-SB-NRS055-10-15-01282020	10-15	1/28/2020	N	17000		0.300	J	5.85		76.4		0.504		9.02	J	0.0552	J	919	
NRS 055	GAF-SB-NRS055-59-60-01282020	59-60	1/28/2020	N	9880		0.246	J	12.0		39.7		1.46		9.91	J	0.0477	J	658	
NRS 056	GAF-SB-NRS056-5-10-01272020	5-10	1/27/2020	N	12600		0.273	J	6.73		50.3		0.326		17.2	J	0.0191	J	268	
NRS 056	GAF-SB-NRS056-40-45-01272020	40-45	1/27/2020	N	10500		0.212	J	1.73		45.9		0.208		11.1	J	< 0.0189	U	964	
NRS 057	GAF-SB-NRS057-40-45-02042020	40-45	2/4/2020	N	17900		0.242	J	7.59		66.2		1.26		8.48	J	0.0454	J	790	
NRS 057	GAF-SB-NRS057-55-60-02042020	55-60	2/4/2020	N	10900		0.195	J	5.60		94.5		1.50		5.83	J	0.0677	J	1170	
NRS 058	GAF-SB-NRS058-10-15-02032020	10-15	2/3/2020	N	14400		0.652	J	27.7		151		1.14		24.3		0.138		16800	
NRS 058	GAF-SB-NRS058-45-50-02032020	45-50	2/3/2020	N	16100		0.170	J	5.51		47.1		0.829		4.72	J	0.0206	J	359	
NRS 059	GAF-903B-02042020	0-5	2/4/2020	FD	15200		0.174	J	5.29		151	J	1.16	J	5.73	J	0.0737	J	2290	J
NRS 059	GAF-SB-NRS059-0-5-02042020	0-5	2/4/2020	N	15300		0.113	J	4.34		44.7	J	0.698	J	10.5		0.0207	J	29400	J
NRS 059	GAF-SB-NRS059-40-45-02042020	40-45	2/4/2020	N	19500		0.0730	J	9.83		74.6		1.97		9.66	J	0.119	J	5240	
NRS 060	GAF-SB-NRS060-5-10-01312020	5-10	1/31/2020	N	17900		1.16	J	14.3		158		1.95		32.3		3.16		4570	
NRS 060	GAF-SB-NRS060-30-35-01312020	30-35	1/31/2020	N	17100		0.175	J	4.99		39.8		0.479		9.25		0.0510	J	580	
NRS 061	GAF-SB-NRS061-5-10-01312020	5-10	1/31/2020	N	16600		0.301	J	4.22		84.4		1.52		34.6		0.565		14600	
NRS 061	GAF-SB-NRS061-15-20-01312020	15-20	1/31/2020	N	15900		0.157	J	5.48		50.2		0.877		19.2		0.137		1030	
NRS 062	GAF-SB-NRS062-0-5-01312020	0-5	1/31/2020	N	7660		1.16	J	22.0		108		0.756		20.3		0.749		53500	
NRS 062	GAF-SB-NRS062-30-33-01312020	30-33	1/31/2020	N	9810		0.0531	J	2.92		46.8		0.609		18.0		0.224		111000	
NRS 064	GAF-SB-NRS064-0-5-02042020	0-5	2/4/2020	N	11800		0.417	J	8.62		106		1.27		28.7		0.362		10200	
NRS 064	GAF-SB-NRS064-15-20-02042020	15-20	2/4/2020	N	7140		1.68	J	26.3		92.6		2.09		212		3.16		11200	
NRS 065	GAF-SB-NRS065-5-10-02042020	5-10	2/4/2020	N	13800		0.175	J	4.39		38.1		0.366		4.73	J	0.0198	J	143	
NRS 065	GAF-SB-NRS065-35-40-02042020	35-40	2/4/2020	N	14300		0.0865	J	3.07		74.5		1.40		8.20	J	0.0707	J	1400	
NRS 067	GAF-SB-NRS067-5-10-01312020	5-10	1/31/2020	N	15000		0.205	J	5.57		36.1		0.622		6.16	J	0.0254	J	593	
NRS 067	GAF-SB-NRS067-30-35-01312020	30-35	1/31/2020	N	13700		0.147	J	5.97		107		1.14		7.78	J	0.190		36700	
NRS 068	GAF-SB-NRS068-40-58-03122020	40-58	3/12/2020	N	7020		0.207	J	5.58	J	43.6		0.516		8.83	J	0.0508	J	324	J
NRS 069	GAF-SB-NRS069-40-50-03092020	40-50	3/9/2020	N	7430		0.202	J	4.77	J	40.7	J	0.420		< 7.45	U*	0.0399	J	617	J
NRS 069	GAF-SO-903-03092020	40-50	3/9/2020	FD	6830		0.195	J	4.44	J	27.3	J	0.446		8.74	J	0.0446	J	181	J
NRS 070	GAF-SB-NRS070-50-60-03102020	50-60	3/10/2020	N	5870		0.312	J	13.5	J	38.9		1.14		< 7.68	U*	0.191		591	J

Notes:

Gray shaded cells indicate that at least a portion of the sample interval was CCR.
J = Quantitation is approximate due to limitations identified during data validation.
UJ = This analyte was not detected, but the reporting or detection limit may or may not be higher due to a bias identified during data validation.
U* = This result should be considered “not detected” because it was detected in a rinsate blank or laboratory blank at a similar level.
< = not detected at the reporting limit shown
mg/kg = milligrams per kilogram
FD = field duplicate sample
N = primary sample
feet bgs = feet below ground surface

Table 4-5
Soil Chemical Results for 2020 Field Investigation
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

				Chromium		Cobalt		Copper		Iron		Lead		Lithium		Magnesium		Manganese		Mercury	
				mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Location ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers
NRS 051	GAF-SB-903-01302020	15-20	1/30/2020	13.5		2.06		6.47		19900		10.7		9.76		644		101	J	0.121	
NRS 051	GAF-SB-NRS051-15-20-01302020	15-20	1/30/2020	17.1		1.94		6.93		17400		15.0		8.65		698		93.7	J	0.117	
NRS 051	GAF-SB-NRS051-35-39-01302020	35-39	1/30/2020	7.71		7.13		6.35		14400		9.90		6.74		4040		379	J	0.0776	
NRS 052	GAF-SB-NRS052-25-30-01302020	25-30	1/30/2020	11.4		12.9		9.80		19800		18.8		8.32		2210		1180	J	0.0851	
NRS 052	GAF-SB-NRS052-45-50-01302020	45-50	1/30/2020	14.4		6.53		10.8		30700		12.4		10.1		730		215	J	0.0533	
NRS 053	GAF-SB-NRS053-45-50-01292020	45-50	1/29/2020	11.8		6.30		12.6		35000		17.8		6.42		540		272	J	< 0.0274	U
NRS 053	GAF-SB-NRS053-70-72-01302020	70-72	1/30/2020	8.92		7.50		12.0		17900		11.3		10.8		1140		1150	J	0.0561	
NRS 054	GAF-SB-NRS054-10-15-01282020	10-15	1/28/2020	12.6		1.49		15.6		18100		7.60		7.21		479		62.7	J	0.152	
NRS 054	GAF-SB-NRS054-65-66-01292020	65-66	1/29/2020	12.8		9.42		13.2		29000		14.5		15.3		1570		2450	J	0.0707	
NRS 055	GAF-SB-NRS055-10-15-01282020	10-15	1/28/2020	15.8		1.66		10.6		16900		8.63		13.5		827		73.1	J	0.127	
NRS 055	GAF-SB-NRS055-59-60-01282020	59-60	1/28/2020	9.20		4.64		8.35		23100		10.4		6.44		411		119	J	0.0547	
NRS 056	GAF-SB-NRS056-5-10-01272020	5-10	1/27/2020	13.4		1.61		6.22		27000		9.88		9.63		553		111	J	0.0753	
NRS 056	GAF-SB-NRS056-40-45-01272020	40-45	1/27/2020	6.95		1.47		8.16		5900		10.8		9.10		493		21.2	J	0.0388	
NRS 057	GAF-SB-NRS057-40-45-02042020	40-45	2/4/2020	21.3	J	20.3	J	9.49	J	26200		16.1		12.6		917		1300		0.0658	
NRS 057	GAF-SB-NRS057-55-60-02042020	55-60	2/4/2020	9.82	J	8.23	J	10.3	J	18600		8.72		7.54		544		581		0.0459	
NRS 058	GAF-SB-NRS058-10-15-02032020	10-15	2/3/2020	18.6	J	3.39	J	21.8	J	48000		24.1		7.43		580		48.7		0.144	
NRS 058	GAF-SB-NRS058-45-50-02032020	45-50	2/3/2020	10.5	J	3.42	J	12.0	J	16800		10.3		13.6		793		176		0.0529	
NRS 059	GAF-903B-02042020	0-5	2/4/2020	10.4	J	7.88	J	7.27	J	20300		12.9		7.84	J	923	J	476	J	0.0648	
NRS 059	GAF-SB-NRS059-0-5-02042020	0-5	2/4/2020	11.4	J	5.39	J	7.54	J	18300		9.45		15.0	J	4830	J	229	J	0.0521	
NRS 059	GAF-SB-NRS059-40-45-02042020	40-45	2/4/2020	13.2	J	8.98	J	17.9	J	32300		15.7		20.2		2520		379		< 0.0284	U
NRS 060	GAF-SB-NRS060-5-10-01312020	5-10	1/31/2020	36.2	J	7.94	J	15.7	J	42700		11.9		13.6		333		47.6		< 0.0289	U
NRS 060	GAF-SB-NRS060-30-35-01312020	30-35	1/31/2020	12.1	J	4.77	J	7.59	J	19300		7.26		10.5		831		227		0.0610	
NRS 061	GAF-SB-NRS061-5-10-01312020	5-10	1/31/2020	13.1	J	5.12	J	8.52	J	31600		2.55		8.29		466		50.1		0.149	
NRS 061	GAF-SB-NRS061-15-20-01312020	15-20	1/31/2020	9.35	J	2.22	J	11.2	J	30200		9.45		5.85		1040		60.5		0.0397	J
NRS 062	GAF-SB-NRS062-0-5-01312020	0-5	1/31/2020	25.8	J	4.79	J	12.1	J	85800		16.4		3.25		388		83.6		0.0523	
NRS 062	GAF-SB-NRS062-30-33-01312020	30-33	1/31/2020	5.35	J	2.15	J	7.82	J	8890		14.6		6.30		2260		143		0.0449	
NRS 064	GAF-SB-NRS064-0-5-02042020	0-5	2/4/2020	14.8	J	4.50	J	10.8	J	39000		5.53		6.93		484		52.5		0.263	
NRS 064	GAF-SB-NRS064-15-20-02042020	15-20	2/4/2020	30.1	J	7.66	J	16.2	J	43500		8.99		4.87		731		150		< 0.0270	U
NRS 065	GAF-SB-NRS065-5-10-02042020	5-10	2/4/2020	11.3	J	1.66	J	6.28	J	14800		7.45		7.97		528		52.9		0.0393	J
NRS 065	GAF-SB-NRS065-35-40-02042020	35-40	2/4/2020	4.79	J	9.40	J	11.7	J	22000		10.4		7.24		1300		911		< 0.0285	U
NRS 067	GAF-SB-NRS067-5-10-01312020	5-10	1/31/2020	14.6	J	1.55	J	7.67	J	18300		8.83		12.1		595		58.7		0.0766	
NRS 067	GAF-SB-NRS067-30-35-01312020	30-35	1/31/2020	10.1	J	8.82	J	9.81	J	18600		12.5		10.3		5060		639		0.0758	
NRS 068	GAF-SB-NRS068-40-58-03122020	40-58	3/12/2020	10.3		2.20	J	7.09		19300	J	7.81		4.46		311	J	95.5	J	< 0.0245	U
NRS 069	GAF-SB-NRS069-40-50-03092020	40-50	3/9/2020	16.8	J	2.89	J	6.83		17600	J	5.96		3.95		443	J	175	J	< 0.0274	U
NRS 069	GAF-SO-903-03092020	40-50	3/9/2020	6.45	J	17.3	J	8.95		16700	J	6.09		3.34		302	J	97.6	J	< 0.0272	
NRS 070	GAF-SB-NRS070-50-60-03102020	50-60	3/10/2020	25.8		28.5	J	11.2		29000	J	9.72		3.90		366	J	1200	J	0.0309	J

Notes:

Gray shaded cells indicate that at least a portion of the sample interval was CCR.
J = Quantitation is approximate due to limitations identified during data validation.
UJ = This analyte was not detected, but the reporting or detection limit may or may not be higher due to a bias identified during data validation.
U* = This result should be considered "not detected" because it was detected in a rinsate blank or laboratory blank at a similar level.
< = not detected at the reporting limit shown
mg/kg = milligrams per kilogram
FD = field duplicate sample
N = primary sample
feet bgs = feet below ground surface

Table 4-5
Soil Chemical Results for 2020 Field Investigation
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

				Molybdenum		Nickel		Phosphorus		Potassium		Selenium		Silver		Sodium		Sulfur		Thallium	
				mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Location ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers
NRS 051	GAF-SB-903-01302020	15-20	1/30/2020	1.34		6.29		490		917		0.755		< 0.0295	U	28.7	J	2400		0.237	
NRS 051	GAF-SB-NRS051-15-20-01302020	15-20	1/30/2020	1.60		6.86		371		833		0.591		< 0.0269	U	27.7	J	1820		0.258	
NRS 051	GAF-SB-NRS051-35-39-01302020	35-39	1/30/2020	0.669		8.62		678		1060		1.28		< 0.0293	U	61.2		< 1750	U	0.168	
NRS 052	GAF-SB-NRS052-25-30-01302020	25-30	1/30/2020	1.17		13.1		793		1170		1.81		< 0.0316	U	34.3	J	375	J	0.250	
NRS 052	GAF-SB-NRS052-45-50-01302020	45-50	1/30/2020	1.83		13.8		1150		1590		1.86		< 0.0334	U	45.0	J	599		0.354	
NRS 053	GAF-SB-NRS053-45-50-01292020	45-50	1/29/2020	2.37		17.0		1490		1170		2.43		< 0.0303	U	33.0	J	835		0.241	
NRS 053	GAF-SB-NRS053-70-72-01302020	70-72	1/30/2020	0.585	J	21.7		587		1300		2.45		< 0.0323	U	56.3	J	187	J	0.215	
NRS 054	GAF-SB-NRS054-10-15-01282020	10-15	1/28/2020	1.48		5.37		456		602		0.972		< 0.0293	U	< 21.6	U	1960		0.220	
NRS 054	GAF-SB-NRS054-65-66-01292020	65-66	1/29/2020	0.841		30.9		753		1430		2.17		< 0.0304	U	62.4		< 172	U	0.647	
NRS 055	GAF-SB-NRS055-10-15-01282020	10-15	1/28/2020	1.21		7.63		368		742		0.925		< 0.0282	U	33.8	J	1780		0.270	
NRS 055	GAF-SB-NRS055-59-60-01282020	59-60	1/28/2020	1.53		8.88		1050		841		1.62		< 0.0324	U	28.4	J	602		0.275	
NRS 056	GAF-SB-NRS056-5-10-01272020	5-10	1/27/2020	1.50		4.74		555		851		0.650		< 0.0280	U	38.3	J	1930		0.357	
NRS 056	GAF-SB-NRS056-40-45-01272020	40-45	1/27/2020	0.942		4.84		203		1030		1.46		< 0.0300	U	28.4	J	198	J	0.194	
NRS 057	GAF-SB-NRS057-40-45-02042020	40-45	2/4/2020	1.52		9.13	J	1350		1200		1.68	J	< 0.0336	U	47.6	J	742		0.313	
NRS 057	GAF-SB-NRS057-55-60-02042020	55-60	2/4/2020	1.29		12.8	J	578		1020		0.325	J	< 0.0280	U	< 20.7	U	< 167	U	0.241	
NRS 058	GAF-SB-NRS058-10-15-02032020	10-15	2/3/2020	7.02		11.2	J	467		1710		2.54	J	0.0429	J	228		16500		2.24	
NRS 058	GAF-SB-NRS058-45-50-02032020	45-50	2/3/2020	1.45		9.79	J	663		1180		1.23	J	< 0.0325	U	< 24.0	U	< 179	U	0.240	
NRS 059	GAF-903B-02042020	0-5	2/4/2020	0.858		9.30	J	1590		1020	J	2.09	J	< 0.0304	U	81.5		226	J	0.235	
NRS 059	GAF-SB-NRS059-0-5-02042020	0-5	2/4/2020	0.601		10.6	J	1210		1800	J	1.28	J	< 0.0302	U	152		721		0.180	
NRS 059	GAF-SB-NRS059-40-45-02042020	40-45	2/4/2020	0.748		26.6	J	1160		2300		1.91	J	< 0.0342	U	72.7		< 181	U	0.431	
NRS 060	GAF-SB-NRS060-5-10-01312020	5-10	1/31/2020	3.26		27.7	J	236		533		9.00	J	0.0487	J	128		18900		1.13	
NRS 060	GAF-SB-NRS060-30-35-01312020	30-35	1/31/2020	1.58		7.44	J	506		870		0.759	J	< 0.0311	U	29.2	J	1510		0.262	
NRS 061	GAF-SB-NRS061-5-10-01312020	5-10	1/31/2020	3.18		15.5	J	57.2		784		0.611	J	< 0.0287	U	162		42700		0.523	
NRS 061	GAF-SB-NRS061-15-20-01312020	15-20	1/31/2020	0.559	J	8.25	J	645		2090		1.48	J	< 0.0342	U	43.5	J	2040		0.227	
NRS 062	GAF-SB-NRS062-0-5-01312020	0-5	1/31/2020	4.39		13.3	J	402		1350		3.75	J	0.0464	J	250		49100		0.759	
NRS 062	GAF-SB-NRS062-30-33-01312020	30-33	1/31/2020	0.205	J	5.23	J	555		2310		1.43	J	< 0.0332	U	45.8	J	< 172	U	0.355	
NRS 064	GAF-SB-NRS064-0-5-02042020	0-5	2/4/2020	4.49		13.5	J	150		1080		1.42	J	< 0.0290	U	160		12500		0.949	
NRS 064	GAF-SB-NRS064-15-20-02042020	15-20	2/4/2020	6.26		22.7	J	171		665		4.96	J	< 0.0373	U	97.7		1640		1.83	
NRS 065	GAF-SB-NRS065-5-10-02042020	5-10	2/4/2020	0.976		5.33	J	397		746		0.978	J	< 0.0310	U	48.7	J	200	J	0.161	
NRS 065	GAF-SB-NRS065-35-40-02042020	35-40	2/4/2020	0.372	J	16.2	J	695		1730		1.62	J	< 0.0322	U	< 23.7	U	< 171	U	0.182	
NRS 067	GAF-SB-NRS067-5-10-01312020	5-10	1/31/2020	1.32		6.01	J	397		775		0.866	J	< 0.0302	U	< 22.2	U	992		0.236	
NRS 067	GAF-SB-NRS067-30-35-01312020	30-35	1/31/2020	0.873		13.8	J	1310		1480		1.44	J	< 0.0306	U	64.8		720		0.247	
NRS 068	GAF-SB-NRS068-40-58-03122020	40-58	3/12/2020	1.60		8.15	J	460		636		< 0.119	UJ	< 0.0262	U	< 19.3	UJ	553	J	0.201	
NRS 069	GAF-SB-NRS069-40-50-03092020	40-50	3/9/2020	1.44		7.32	J	379		590		< 0.135	UJ	< 0.0298	U	27.5	J	867		0.380	
NRS 069	GAF-SO-903-03092020	40-50	3/9/2020	1.36		17.2	J	510		604		< 0.0937	UJ	< 0.0207	U	28.5	J	1030		0.339	
NRS 070	GAF-SB-NRS070-50-60-03102020	50-60	3/10/2020	2.12		25.2	J	659		672		< 0.0957	UJ	< 0.0212	U	26.3	J	< 175	U	0.226	

Notes:

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U* = This result should be considered “not detected” because it was detected in a rinsate blank or laboratory blank at a similar level.
< = not detected at the reporting limit shown
mg/kg = milligrams per kilogram
FD = field duplicate sample
N = primary sample
feet bgs = feet below ground surface

Table 4-5
Soil Chemical Results for 2020 Field Investigation
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

				Total Inorganic Carbon		Total Organic Carbon		Vanadium		Zinc	
				mg/kg		mg/kg		mg/kg		mg/kg	
Location ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers
NRS 051	GAF-SB-903-01302020	15-20	1/30/2020	< 684	U	1680	J	28.9		25.5	J
NRS 051	GAF-SB-NRS051-15-20-01302020	15-20	1/30/2020	< 684	U	4130	J	27.9		26.0	J
NRS 051	GAF-SB-NRS051-35-39-01302020	35-39	1/30/2020	31200		8240	J	12.0		33.9	J
NRS 052	GAF-SB-NRS052-25-30-01302020	25-30	1/30/2020	12200		880	J	22.4		47.2	J
NRS 052	GAF-SB-NRS052-45-50-01302020	45-50	1/30/2020	< 684	U	5900	J	23.7		43.0	J
NRS 053	GAF-SB-NRS053-45-50-01292020	45-50	1/29/2020	< 684	U	< 684	UJ	26.3		46.5	J
NRS 053	GAF-SB-NRS053-70-72-01302020	70-72	1/30/2020	15000		1170	J	12.0		66.6	J
NRS 054	GAF-SB-NRS054-10-15-01282020	10-15	1/28/2020	< 684	U	1370	J	24.5		22.4	J
NRS 054	GAF-SB-NRS054-65-66-01292020	65-66	1/29/2020	40700		11200	J	17.2		81.7	J
NRS 055	GAF-SB-NRS055-10-15-01282020	10-15	1/28/2020	< 684	U	2010	J	26.1		29.6	J
NRS 055	GAF-SB-NRS055-59-60-01282020	59-60	1/28/2020	< 684	U	< 684	UJ	17.8		29.3	J
NRS 056	GAF-SB-NRS056-5-10-01272020	5-10	1/27/2020	< 684	U	1460	J	25.4		19.9	J
NRS 056	GAF-SB-NRS056-40-45-01272020	40-45	1/27/2020	< 684	U	850	J	22.1		17.9	J
NRS 057	GAF-SB-NRS057-40-45-02042020	40-45	2/4/2020	< 684	U	1510		30.4	J	32.8	
NRS 057	GAF-SB-NRS057-55-60-02042020	55-60	2/4/2020	< 684	U	< 684	U	18.7	J	36.0	
NRS 058	GAF-SB-NRS058-10-15-02032020	10-15	2/3/2020	4780		21100		50.0	J	37.2	
NRS 058	GAF-SB-NRS058-45-50-02032020	45-50	2/3/2020	< 684	U	1260		20.0	J	37.5	
NRS 059	GAF-903B-02042020	0-5	2/4/2020	1310	J	820	J	18.9	J	24.9	
NRS 059	GAF-SB-NRS059-0-5-02042020	0-5	2/4/2020	6990	J	4210	J	17.0	J	34.6	
NRS 059	GAF-SB-NRS059-40-45-02042020	40-45	2/4/2020	2540		< 684	U	15.9	J	80.3	
NRS 060	GAF-SB-NRS060-5-10-01312020	5-10	1/31/2020	7360		15100		86.2	J	61.3	
NRS 060	GAF-SB-NRS060-30-35-01312020	30-35	1/31/2020	< 684	U	5190		23.6	J	26.9	
NRS 061	GAF-SB-NRS061-5-10-01312020	5-10	1/31/2020	1410		3640		30.2	J	37.1	
NRS 061	GAF-SB-NRS061-15-20-01312020	15-20	1/31/2020	< 684	U	2060		16.8	J	30.2	
NRS 062	GAF-SB-NRS062-0-5-01312020	0-5	1/31/2020	9180		14500		54.6	J	49.2	
NRS 062	GAF-SB-NRS062-30-33-01312020	30-33	1/31/2020	6120		< 684	U	8.20	J	21.7	
NRS 064	GAF-SB-NRS064-0-5-02042020	0-5	2/4/2020	5620		11400		34.3	J	31.5	
NRS 064	GAF-SB-NRS064-15-20-02042020	15-20	2/4/2020	10100		7880		54.5	J	93.0	
NRS 065	GAF-SB-NRS065-5-10-02042020	5-10	2/4/2020	< 684	U	690	J	20.5	J	19.9	
NRS 065	GAF-SB-NRS065-35-40-02042020	35-40	2/4/2020	2900		1610		7.69	J	39.6	
NRS 067	GAF-SB-NRS067-5-10-01312020	5-10	1/31/2020	< 684	U	2370		26.1	J	20.6	
NRS 067	GAF-SB-NRS067-30-35-01312020	30-35	1/31/2020	2520		1800		16.7	J	48.4	
NRS 068	GAF-SB-NRS068-40-58-03122020	40-58	3/12/2020	< 684	U			20.6		23.7	J
NRS 069	GAF-SB-NRS069-40-50-03092020	40-50	3/9/2020	< 684	U			23.3		25.6	J
NRS 069	GAF-SO-903-03092020	40-50	3/9/2020	< 684	U			16.9		45.4	J
NRS 070	GAF-SB-NRS070-50-60-03102020	50-60	3/10/2020	< 684	U			22.9		60.7	J

Table 4-6
Sequential Extraction Results for Target Metals in Treatability Test Bulk Soil
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

			Parameter	Beryllium		Cadmium		Iron		Lithium		Nickel	
			Unit	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Location_ID	Sample ID	Sample Depth (feet bgs)	Sample Date	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers	Result	Validator Qualifiers
NRS 068	GAF-SB-NRS068-40-58-03122020 - Step 1	40-58	3/12/2020	< 0.368	U	< 0.0765	U	265		< 0.717	U	< 0.325	U
NRS 068	GAF-SB-NRS068-40-58-03122020 - Step 2		3/12/2020	< 0.0574	UJ	< 0.0395	U	28.9	J	< 0.538	U	< 0.179	U
NRS 068	GAF-SB-NRS068-40-58-03122020 - Step 3		3/12/2020	0.0640	J	< 0.0442	U*	1940		< 0.179	U	< 0.100	U
NRS 068	GAF-SB-NRS068-40-58-03122020 - Step 4		3/12/2020	0.299		0.0197	J	15100		1.57	J	6.26	
NRS 068	GAF-SB-NRS068-40-58-03122020 - Step 5		3/12/2020	< 0.377	UJ	< 0.191	U	< 52.6	UR	2.81	J	< 1.08	UJ
NRS 068	GAF-SB-NRS068-40-58-03122020 - Step 6		3/12/2020	0.105	J	< 0.0132	U	4240		2.43	J	4.00	
NRS 068	GAF-SB-NRS068-40-58-03122020 - Step 7		3/12/2020	0.566		< 0.0132	U	3470		14.3		10.7	
NRS 068	GAF-SB-NRS068-40-58-03122020 - Total		3/12/2020	1.01		0.444		21400		22.3		21.9	
NRS 068	GAF-SB-NRS068-40-58-03122020 - Sum of Steps 1-7		3/12/2020	1.03	J	0.0640	J	25000	J	21.1		21.0	J
NRS 069	GAF-SB-NRS069-40-50-03092020 - Step 1	40-50	3/9/2020	< 0.378	U	< 0.0785	U	999		< 0.736	U	0.365	J
NRS 069	GAF-SB-NRS069-40-50-03092020 - Step 2		3/9/2020	< 0.0589	UJ	< 0.0405	U	91.6	J	< 0.552	U	< 0.184	U
NRS 069	GAF-SB-NRS069-40-50-03092020 - Step 3		3/9/2020	0.0533	J	< 0.0454	U*	993		< 0.184	U	< 0.103	U
NRS 069	GAF-SB-NRS069-40-50-03092020 - Step 4		3/9/2020	0.278	J	0.0208	J	12900		0.917	J	4.50	
NRS 069	GAF-SB-NRS069-40-50-03092020 - Step 5		3/9/2020	< 0.386	UJ	< 0.196	U	< 54.0	UR	< 2.70	U	< 1.10	UJ
NRS 069	GAF-SB-NRS069-40-50-03092020 - Step 6		3/9/2020	0.128	J	< 0.0135	U	5130		2.91	J	3.30	
NRS 069	GAF-SB-NRS069-40-50-03092020 - Step 7		3/9/2020	0.586		< 0.0135	U	3700		13.7		7.02	
NRS 069	GAF-SB-NRS069-40-50-03092020 - Total		3/9/2020	1.04		0.441		23200		18.3		15.1	
NRS 069	GAF-SB-NRS069-40-50-03092020 - Sum of Steps 1-7		3/9/2020	1.04	J	0.0662	J	23800	J	17.5		15.2	J
NRS 070	GAF-SB-NRS070-50-60-03102020 - Step 1	50-60	3/10/2020	< 0.379	U	< 0.0789	U	< 14.3	U	< 0.739	U	< 0.335	U
NRS 070	GAF-SB-NRS070-50-60-03102020 - Step 2		3/10/2020	< 0.0591	UJ	< 0.0407	U	< 10.7	UR	< 0.554	U	< 0.185	U
NRS 070	GAF-SB-NRS070-50-60-03102020 - Step 3		3/10/2020	0.0727	J	< 0.0875	U*	509		< 0.185	U	0.271	J
NRS 070	GAF-SB-NRS070-50-60-03102020 - Step 4		3/10/2020	0.278	J	0.0271	J	7700		1.22	J	4.79	
NRS 070	GAF-SB-NRS070-50-60-03102020 - Step 5		3/10/2020	< 0.388	UJ	< 0.197	U	< 54.2	UR	< 2.71	U	< 1.11	UJ
NRS 070	GAF-SB-NRS070-50-60-03102020 - Step 6		3/10/2020	0.109	J	< 0.0136	U	2680		1.98	J	2.63	
NRS 070	GAF-SB-NRS070-50-60-03102020 - Step 7		3/10/2020	0.615		< 0.0136	U	3340		19.6		10.0	
NRS 070	GAF-SB-NRS070-50-60-03102020 - Total		3/10/2020	1.21		0.506		19400		18.9		20.3	
NRS 070	GAF-SB-NRS070-50-60-03102020 - Sum of Steps 1-7		3/10/2020	1.08	J	0.115	J	14200	J	22.8		17.7	J

Notes:
U* = This result should be considered “not detected” because it was detected in a rinsate blank or laboratory blank at a similar level.
UR = Unreliable reporting or detection limit; analyte may or may not be present in sample.
J = Quantitation is approximate due to limitations identified during data validation.
UJ = This analyte was not detected, but the reporting or detection limit may or may not be higher due to a bias identified during data validation.
U = Analyte not detected above laboratory reporting limit.
feet bgs = feet below ground surface
mg/kg = milligrams per kilogram
< = not detected at reporting level shown.

Table 4-7
X-Ray Diffraction Results for Treatability Test Bulk Soil
NRS Field Investigation Report
TVA Gallatin Fossil Plant, Gallatin, Tennessee

Location_ID	Sample ID	Sample Date	Bulk Sample						Clay Fraction < 2 um		
			Quartz	Goethite	K-Feldspar	Total Clay			Illite	Kaolinite	Chlorite
						Illite	Kaolinite	Chlorite			
NRS 068	GAF-SB-NRS068-40-58-03122020	3/12/2020	26	< 2 *	< 2 *	53	21	< 2 *	71	29	< 2 *
NRS 069	GAF-SB-NRS069-40-50-03092020	3/9/2020	48	< 2 *	-	33	19	< 2 *	63	37	< 2 *
NRS 070	GAF-SB-NRS070-50-60-03102020	3/10/2020	43	< 2 *	-	37	20	< 2 *	65	35	< 2 *

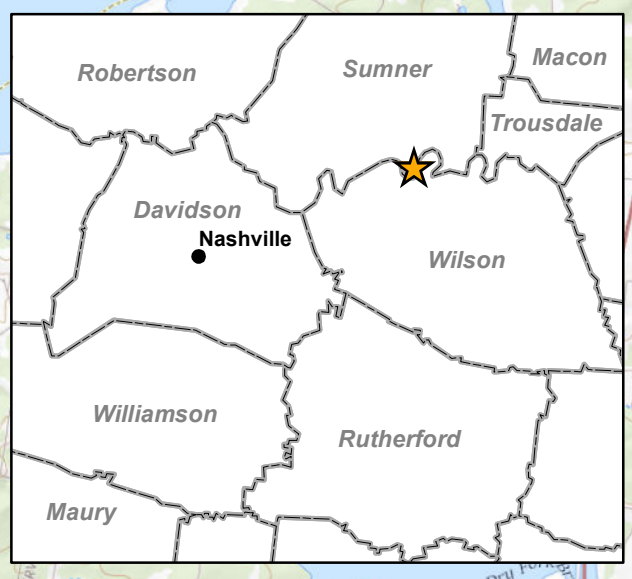
Notes:
Units in percent of total sample
< = Less than
* = may be present

Figures

Gallatin

Gallatin Fossil Plant

NRS



LEGEND

Non-Registered Site (NRS) Boundary

TVA Gallatin Fossil Plant Property Boundary (Approximate)

N

0 4,000 8,000

Feet

NOTE: USGS 7.5' Topographic Quadrangle Map
Source - ESRI USGS Topo Layer

AECOM

Figure 1-1

GALLATIN FOSSIL PLANT (GAF)
LOCATION MAP

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GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

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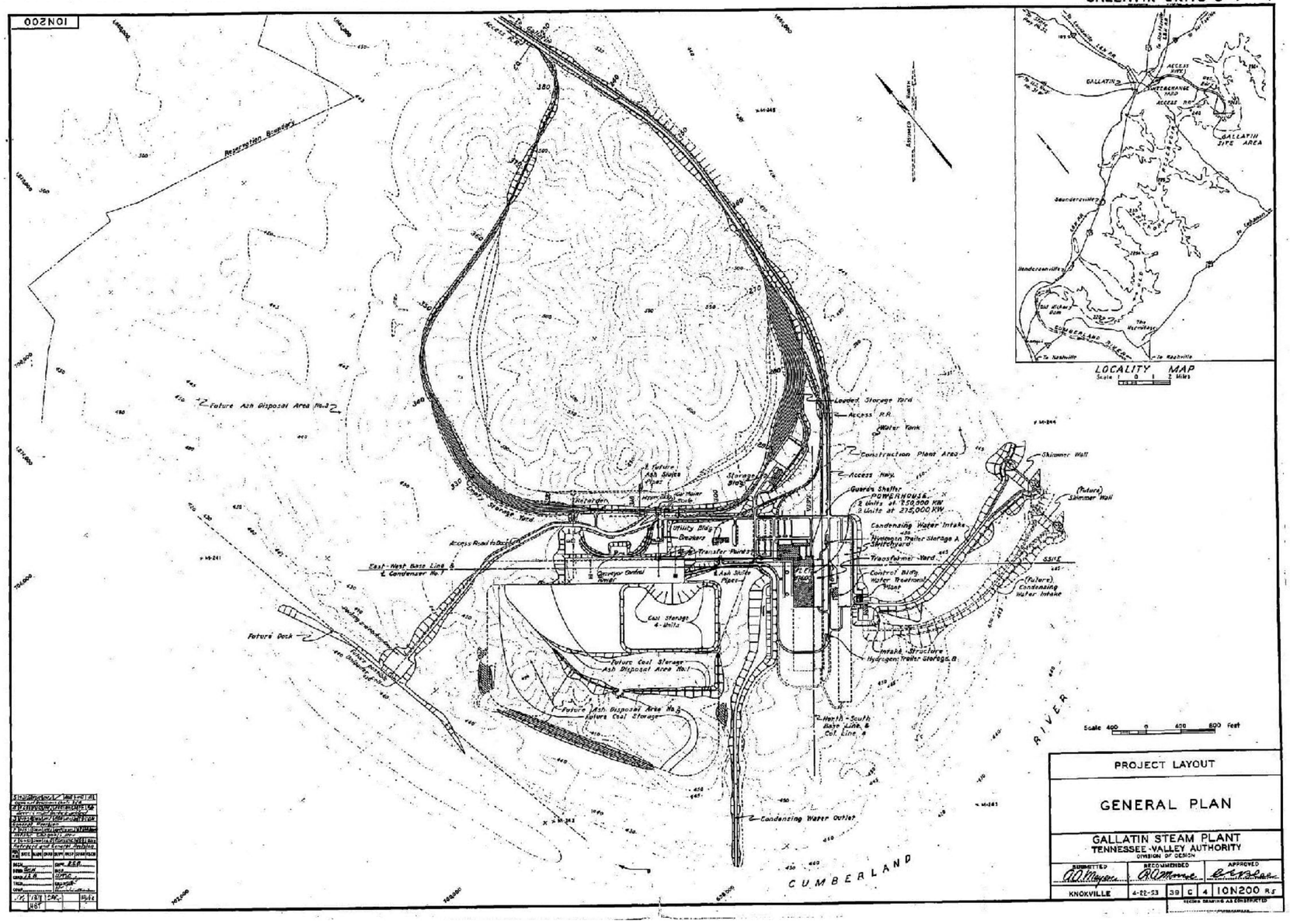

NOTE: Image from 1967 TVA Dam Inspection Report

Not to Scale

Figure 1-2

TVA DRAWING 10N200

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Plotted: Path: M:\Engr\Proj\TVA_GAFN\DS\900_GISINRS_DRAWING_10N200.mxd

Ash Pond Complex

NPDES Outfall F13

A

B

C

D

Non-Registered Site (NRS)

Coal Yard Runoff Ditch

Coal Yard

Coal Pile

Primary Pyritic Sulfur Area

Scrubber Facility

Ash Silos

Lime Silos

GAF-441U

S3

19R

GAF-444U

Discharge Channel

Cumberland River

NOTE: Aerial image dated February 2017

LEGEND

- Asbestos Landfill Limit
- CCR Management Units
- NRS Cell Boundary
- Primary Pyritic Sulfur Area - Area of NRS where pyritic sulfur exists at some of the highest mass fractions (up to 3.02%), in both the unsaturated and saturated zones, and to the greatest depth (25 ft bgs)
- Monitoring Well with Low pH and Elevated Metals

Notes:
CCR - Coal Combustion Residuals
ft bgs - feet below ground surface

N

0 400 800
Feet

AECOM

Figure 1-3

NON-REGISTERED SITE (NRS)
OPERATING AREAS AND PRIMARY
PYRITIC SULFUR AREA

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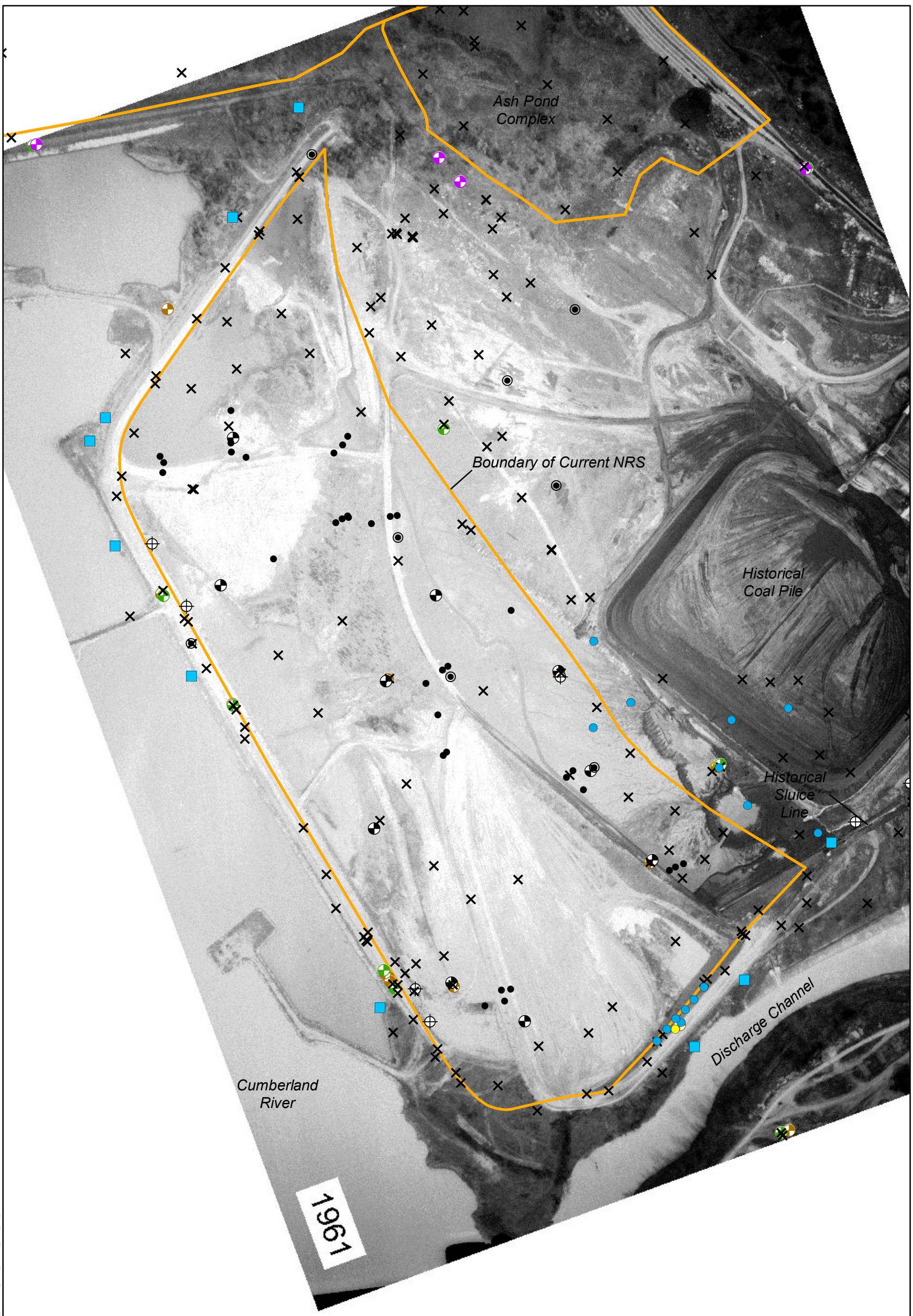

NOTE: Aerial image dated February 1961

LEGEND:

- Well Screened in Unconsolidated Material
- Well Screened in Lebanon Limestone
- Well Screened in Carters Limestone
- Well Screened in CCR
- New Monitoring Well Screened In Unconsolidated Material
- New Direct Push Boring Location
- New Sonic Boring Location
- Historic Seep Location
- Historic Well (Limited Data)
- Historic Location
- Cone Penetration Test (CPT) Location
- CCR Management Units

Notes:
CCR - Coal Combustion Residuals
NRS - Non-Registered Site

0 300 600
Feet

AECOM

Figure 1-4

1961 AERIAL PHOTOGRAPH OF HISTORICAL SLUICING OPERATIONS

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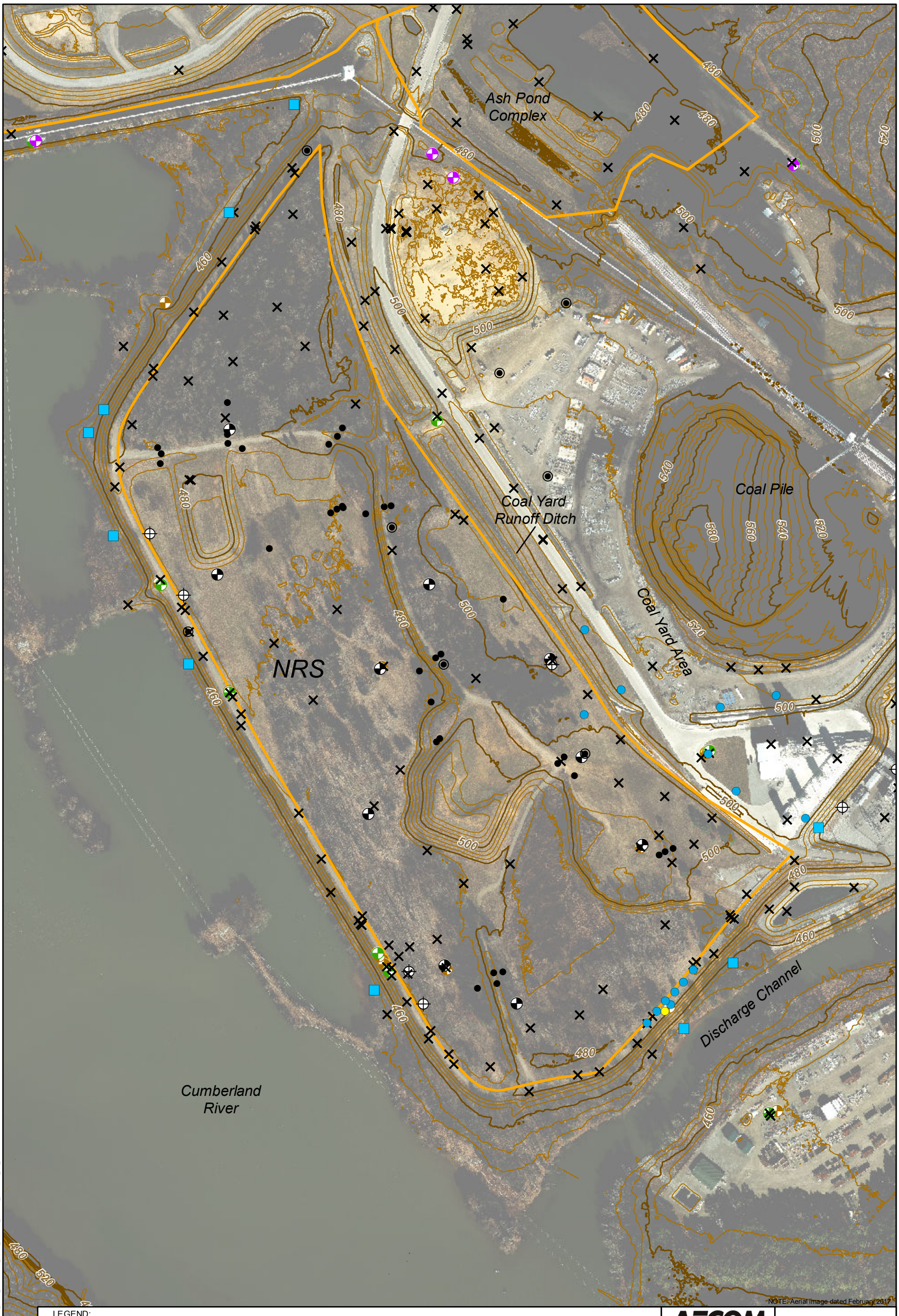

LEGEND:

- Well Screened in Unconsolidated Material
- Well Screened in Lebanon Limestone
- Well Screened in Carters Limestone
- Well Screened in CCR
- New Monitoring Well Screened In Unconsolidated Material
- New Direct Push Boring Location
- New Sonic Boring Location
- Historic Seep Location
- Historic Location
- Abandoned Well
- Historic Well (Limited Data Available)
- Cone Penetration Test (CPT) Location
- CCR Management Units
- Contour - Index 20 ft.
- Contour - Intermediate 5 ft.

Notes:
CCR - Coal Combustion Residuals
NRS - Non-Registered Site

0 300 600
Feet

NOTE: Aerial Image dated February 2017

AECOM

Figure 1-5

2017 GROUND SURFACE TOPOGRAPHY

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Document Path: K:\TVA_GAF\NRS\920_GIS\NRS_NEW_EXISTING_DATA_POINTS_Current_Contours_No_Labels.mxd

Ash Pond Complex

NRS

Coal Yard Runoff Ditch

Coal Yard Area

Coal Pile

Discharge Channel

Cumberland River

NOTE: Aerial image dated February 2017

LEGEND:

- Well Screened in Unconsolidated Material
- Well Screened in Lebanon Limestone
- Well Screened in Carters Limestone
- Well Screened in CCR
- New Monitoring Well Screened In Unconsolidated Material
- New Direct Push Boring Location
- New Sonic Boring Location
- Historic Seep Location
- Historic Well (Limited Data
- Historic Boring
- Abandoned Well
- Cone Penetration Test (CPT) Location
- CCR Management Units
- 1952 Contours (ft msl); 10ft Contour Intervals, Except a 453ft Contour Replaces the 450 ft Contour

Notes:
CCR - Coal Combustion Residuals
NRS - Non-Registered Site

0 300 600
Feet

AECOM

Figure 1-6

ESTIMATED 1952 GROUND SURFACE TOPOGRAPHY

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LEGEND:

- Well Screened in Unconsonlidated Material
- Well Screened in Lebanon Limestone
- Well Screened in Carters Limestone
- Well Screened in CCR
- New Monitoring Well Screened In Unconsolidated Material
- New Direct Push Boring Location
- New Sonic Boring Location
- Historic Seep Location
- Historic Boring
- Historic Well (Limited Data
- Abandoned Well
- Cone Penetration Test (CPT) Location
- CCR Management Units
- Top of Rock (10ft. index contour interval)
- Top of Rock (5ft. intermediate contour interval)

Notes:
CCR - Coal Combustion Residuals
NRS- Non-Registered Site

0 300 600
Feet

AECOM

Figure 1-7

BEDROCK SURFACE ELEVATION CONTOUR MAP

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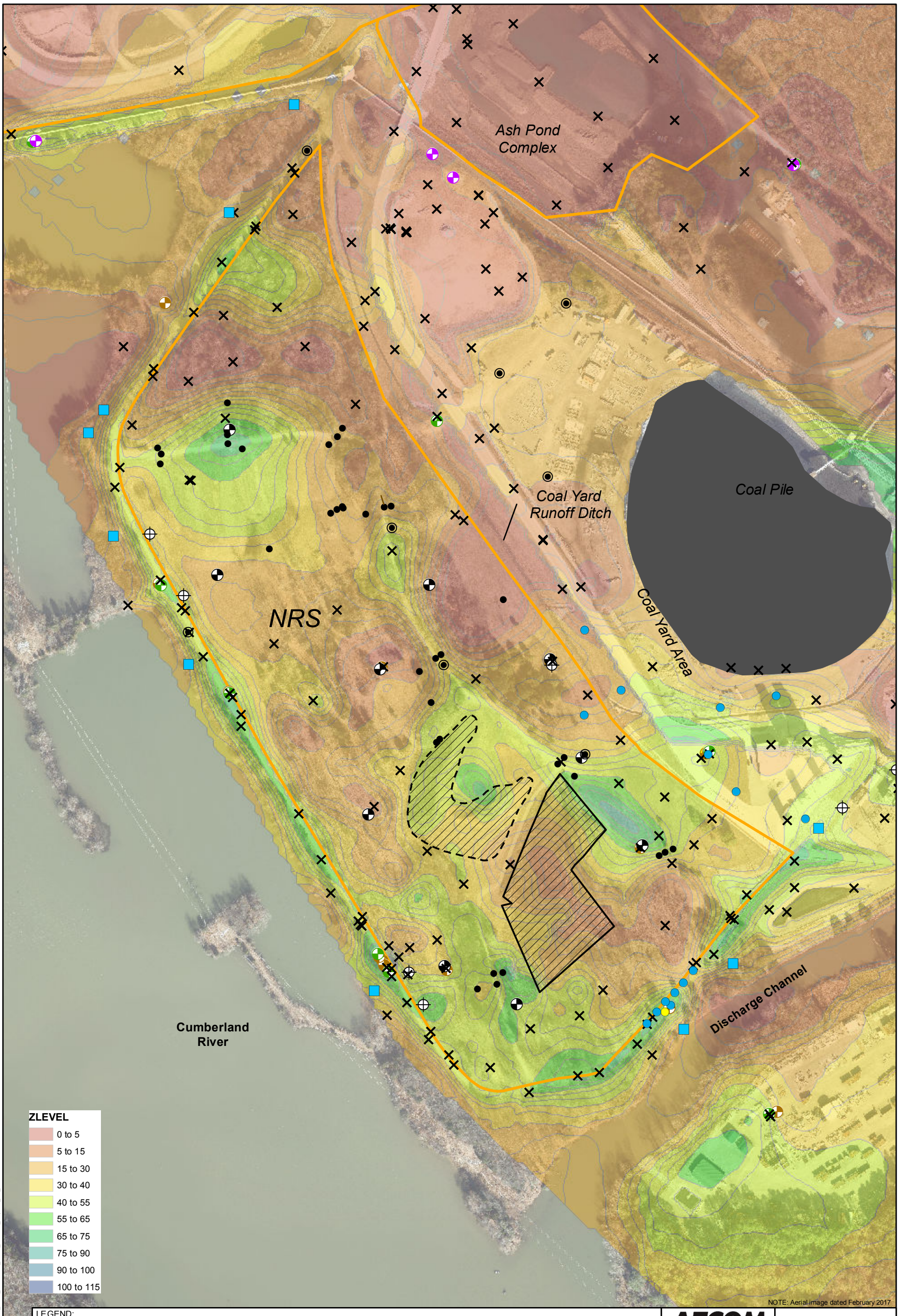
Ash Pond Complex
Coal Pile
Coal Yard Runoff Ditch
Coal Yard Area
NRS
Cumberland River
Discharge Channel
ZLEVEL
0 to 5
5 to 15
15 to 30
30 to 40
40 to 55
55 to 65
65 to 75
75 to 90
90 to 100
100 to 115
NOTE: Aerial image dated February 2017
LEGEND:
Well Screened in Unconsolidated Material
Well Screened in Lebanon Limestone
Well Screened in Carters Limestone
Well Screened in CCR
New Monitoring Well Screened In Unconsolidated Material
New Direct Push Boring Location
New Sonic Boring Location
Historic Seep Location
Cone Penetration Test (CPT) Location
Historic Boring
Abandoned Well
Historic Well (Limited Data Available)
CCR Management Units
Coal Pile
Estimated Extent of Soil Stockpile
Asbestos Landfill Limit
Notes:
CCR - Coal Combustion Residual
NRS - Non-Registered Site
0
300
600
Feet
AECOM
Figure 1-8
UNCONSOLIDATED MATERIAL
ISOPACH CONTOUR MAP
DRAWN BY: T.ADHAM
REVIEWED BY: S.BUCHANAN
APPROVED BY: M.STAUFFER
REVISION NUMBER: REV. 0
GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
DATE: 1/14/2021
DEPT: FOSSIL AND HYDRO ENGINEERING
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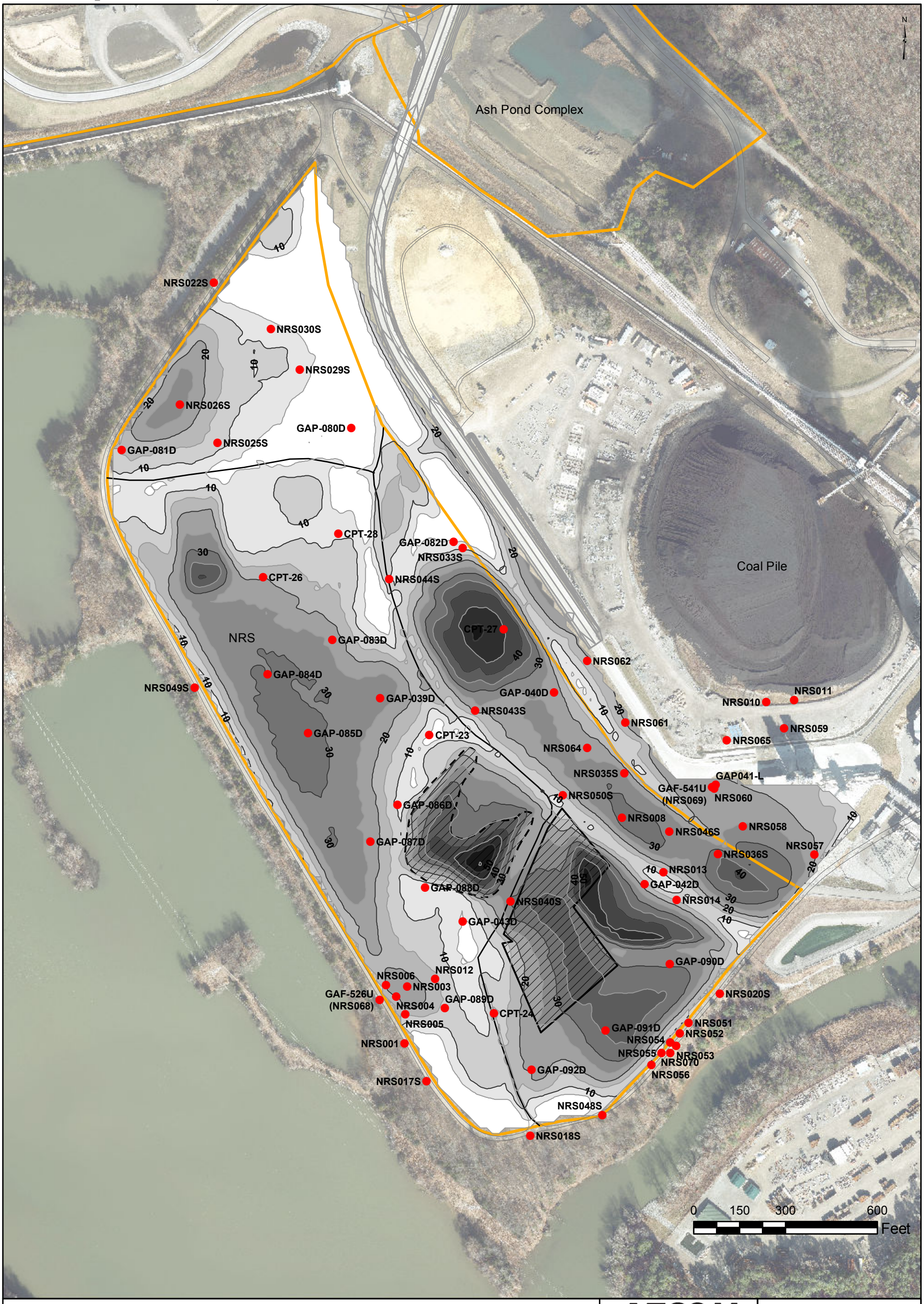

CCR Thickness Contours
(5 ft Contour Interval/10 ft Index Contour)

- Isopach Contour (in feet, thickness)
- Site Features
- CCR Waste Boundaries
- TVA Boundary
- Estimated Extent of Soil Stockpile
- Asbestos Landfill Limit
- Boring Location Used for Estimating CCR Bottom Elevation

CCR Thickness In Feet

0 - 5	25 - 30
5 - 10	30 - 35
10 - 15	35 - 40
15 - 20	40 - 45
20 - 25	45 - 50
	>50

Notes:
CCR bottom elevations were subtracted from 2017 Lidar data to produce the CCR isopach. The Soil Stockpile and Asbestos landfill unconsolidated material was not removed from the surface.

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Figure 1-9

CCR ISOPACH MAP

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SW

NE

Non-Registered Site

Coal Pile

Coal Yard
Runoff Ditch

Cumberland River

Elevation (feet MSL)

5X Vertical Exaggeration

550
500
450
400
350

0 250 500 750 1000 1250 1500 1750 2000 2250 2500 2750 3000 3250

Distance (feet)

LEGEND

- CCR
- Sand / Gravel
- Silt / Clay
- Lower Carters Limestone
- Lebanon Limestone
- Ridley Limestone
- Ground Surface
- Top of Rock (Dashed Where Approximate)
- Geologic Contact (Dashed Where Approximate)
- Cumberland River
- Phreatic Surface in CCR
- Approximate Lower Limit of CCR

NOTE: Cross section is schematic to show conceptual model and may not represent a specific physical location

- Groundwater Table in Alluvium
- Hypothetical Fractures

Generalized Location

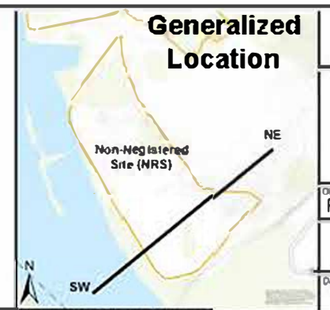

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Figure 1-10

CONCEPTUAL GEOLOGIC CROSS SECTION - NRS

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GALLATIN FOSSIL PLANT
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Document Path: O:\DCS\Projects\L-URS\Jobs4_Projects\TVA\Gallatin_General\EIP\11.0 GIS\geologic_cross_sections\MXD\NRSRev0\NRS Conceptual Hydrogeo Model.mxd

LEGEND:

GAF-444U — Well Screened in Unconsolidated Deposits

GAF-445L — Well Screened in Lebanon Limestone

GAF-405C — Well Screened in Carters Limestone

GAF-442A — Well Screened in Ash

GAF-444U — New Monitoring Well Screened In Unconsolidate Material

NRS070 — New Sonic Boring

NRS070 — New Direct Push Boring Location

NRS - Non-Registered Site

- Cone Penetration Test (CPT) Location
- Seep
- Historic Well (Limited Data Available)
- Historic Boring
- Abandoned Well
- CCR Management Units
- Primary Pyritic Sulfur Area - Area of NRS where pyritic sulfur exists at some of the highest mass fractions (up to 3.02%), in both the unsaturated and saturated zones, and to the greatest depth (25 ft bgs)

Notes:
CCR - Coal Combustion Residuals
ft bgs - feet below ground surface

0 200 400 Feet

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Figure 2-1

NEW AND EXISTING DATA POINTS AT THE NRS

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Document Path: K:\TVA_GAF\NRS\920 - GIS\NRS_NEW_EXISTING_DATA_POINTS_greved.mxd

GAF-450C
446.61
GAF-450L
450.41 (L1)
2F
<458
GAF-451CR
474.98
GAF-451C
476.48
Ash Pond
Complex
GAF-405C
479.87
GAF-405L
473.85 (L1)
2E
<460
GAF-447U
449.11
2D
<461
GP-1
471.78
2C
<456
GAF-438L
481.22 (L1)
Coal Yard
Runoff Ditch
A
Coal Pile
B
2B
<448
GP-3
465.42
20
450.49
27
456.73 (L1)
GP-2
473.47
490
C
Coal Yard Area
GAF-440AR
488.64
GAF-439A
469.19
GAF-439U
469.87
GAF-440U
490.65
2A
<452
GAF-448U
461.14
GAF-448L
460.28 (L2)
Primary
Pyritic Sulfur
Area
GAF-441U
489.46
GAF-441L
488.85 (L1)
GP-5
476.03
GAF-541U
489.37
GP-4
464.52
1A
<485
C'
GAF-442A
486.00
GAF-442U
468.60
480
470
460
E
D'
1B
<449
450
26
458.75 (L1)
S3
453.49
GAF-526U
457.63
GAF-526L
444.82 (L*)
GAF-489A
462.80
GAF-489U
461.01
19R
451.46
19R
<447
GP-6
470.17
GAF-444U
449.56
E'
1C
<448
B
D
Cumberland
River Elevation
444.98
Discharge Channel
GAF-445L
445.45 (L1)
22
446.23
N
A'
NOTE: Aerial image dated February 2017

LEGEND:

GP-4
472.14
Well Screened in CCR and Phreatic Surface Elevation (ft msl) June 15, 2020

GAF-444U
451.13
Well Screened in Unconsolidated Material and Groundwater Elevation (ft msl) June 15, 2020

CCR - Coal Combustion Residuals
ft bgs - feet below ground surface

GAF-405C
483.08
Well Screened in Carters Limestone and Groundwater Elevation (ft msl) June 15,2020

GAF-441L
490.04
Well Screened in Lebanon Limestone and Groundwater Elevation (ft msl) June 15,2020
(L1) and (L2) indicate designated fracture zone in Lebanon Limestone
(L*) indicates a fracture deeper than the L2

<448 Historic Seep Location and Ground Surface Elevation (ft msl), < indicates dry
CCR Management Units
Cross Section
Potentiometric Contour (ft msl) in Unconsolidated Material
Approximate Eastern Extent of Saturated Overburden near the NRS
Primary Pyritic Sulfur Area - Area of NRS where pyritic sulfur exists at some of the highest mass fractions (up to 3.02%), in both the unsaturated and saturated zones, and to the greatest depth (25 ft bgs)

0 200 400
Feet

AECOM

Figure 3-1

GROUNDWATER ELEVATIONS IN OVERBURDEN AND ROCK WITH POTENTIOMETRIC ELEVATION CONTOURS IN UNCONSOLIDATED MATERIAL

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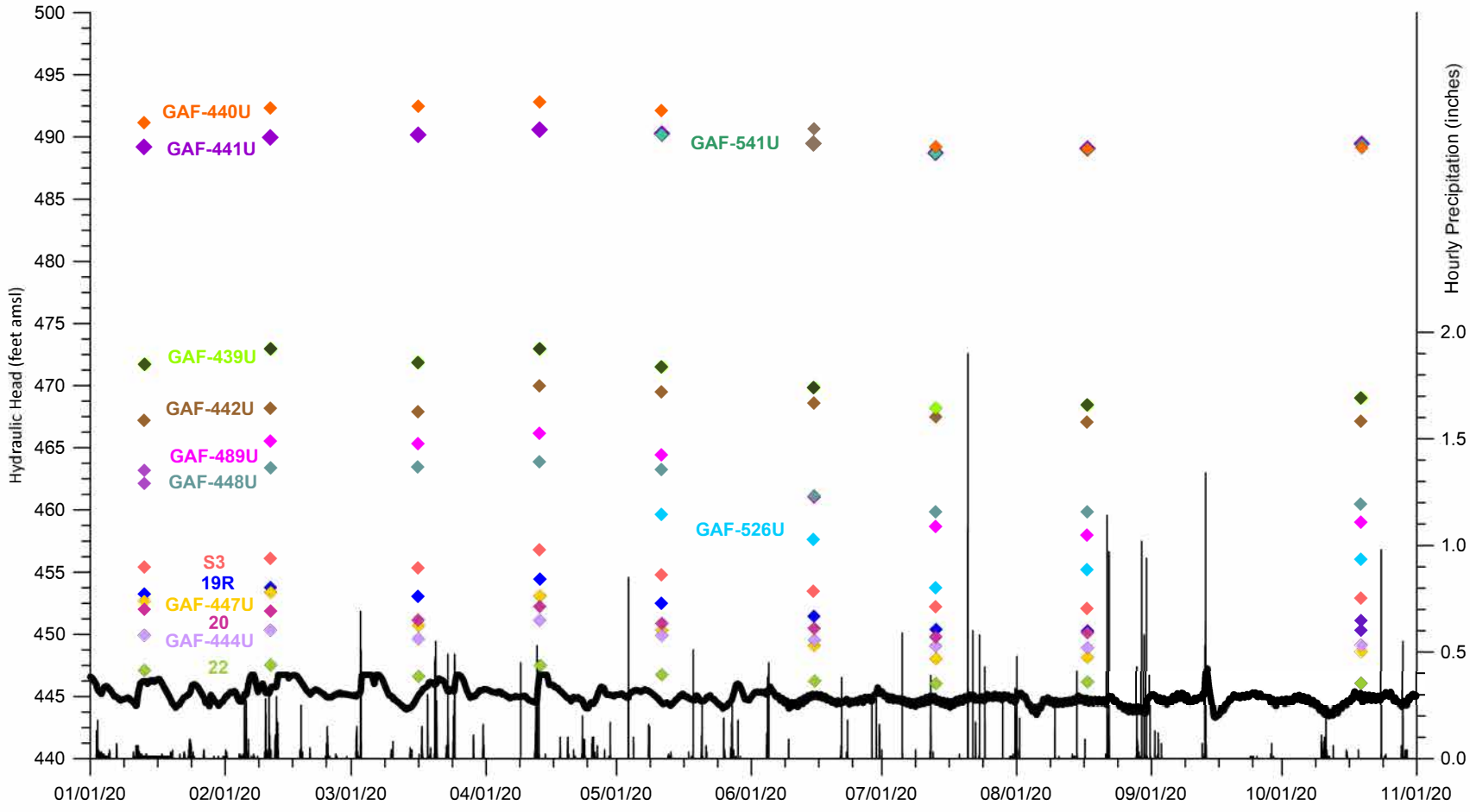

LEGEND

- Manual Gauging for Well Indicated
- Surface Water Level in River
- Precipitation

AECOM

Figure 3-2a

2020 GROUNDWATER ELEVATION HYDROGRAPHS - UNCONSOLIDATED MATERIAL

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GALLATIN FOSSIL PLANT
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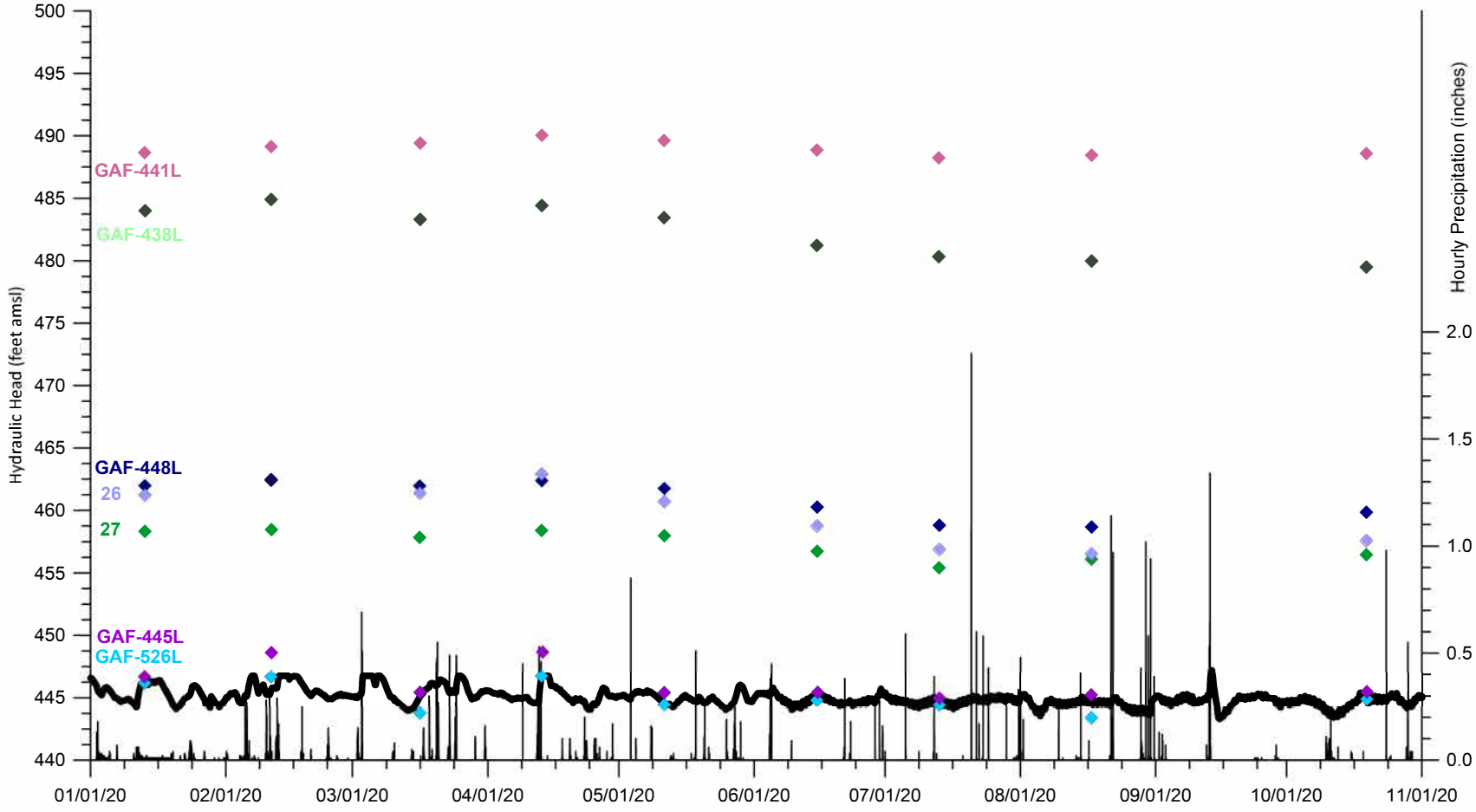

LEGEND

- Manual Gauging for Well Indicated
- Surface Water Level in River
- Precipitation

AECOM

Figure 3-2b

2020 GROUNDWATER ELEVATION HYDROGRAPHS - LEBANON LIMESTONE

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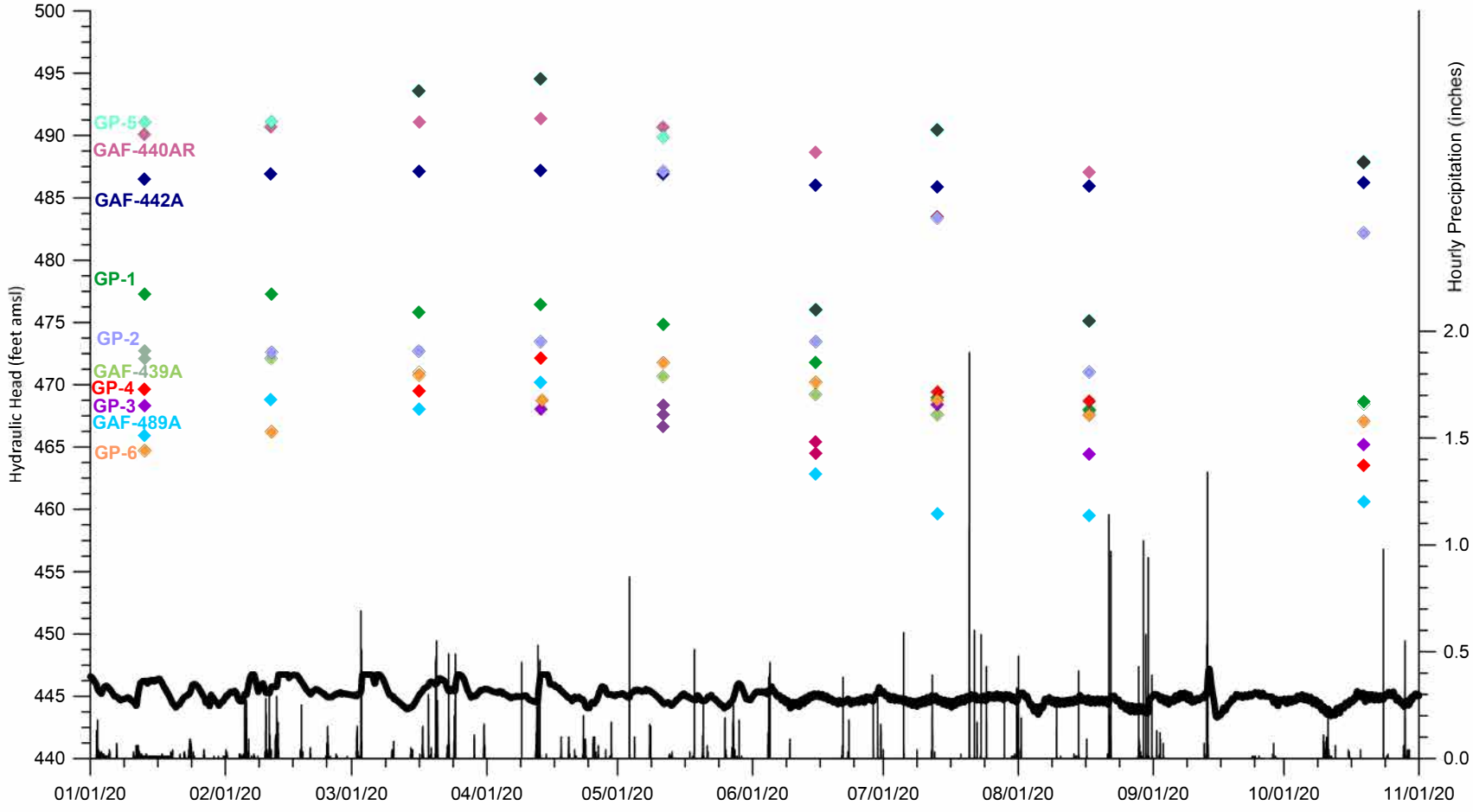
DATE:	DEPT:
11/23/2020	FOSSIL AND HYDRO ENGINEERING



LEGEND

- Manual Gauging for Well Indicated
- Surface Water Level in River
- Precipitation

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Figure 3-2c

2020 PHREATIC SURFACE ELEVATION HYDROGRAPHS - CCR WELLS

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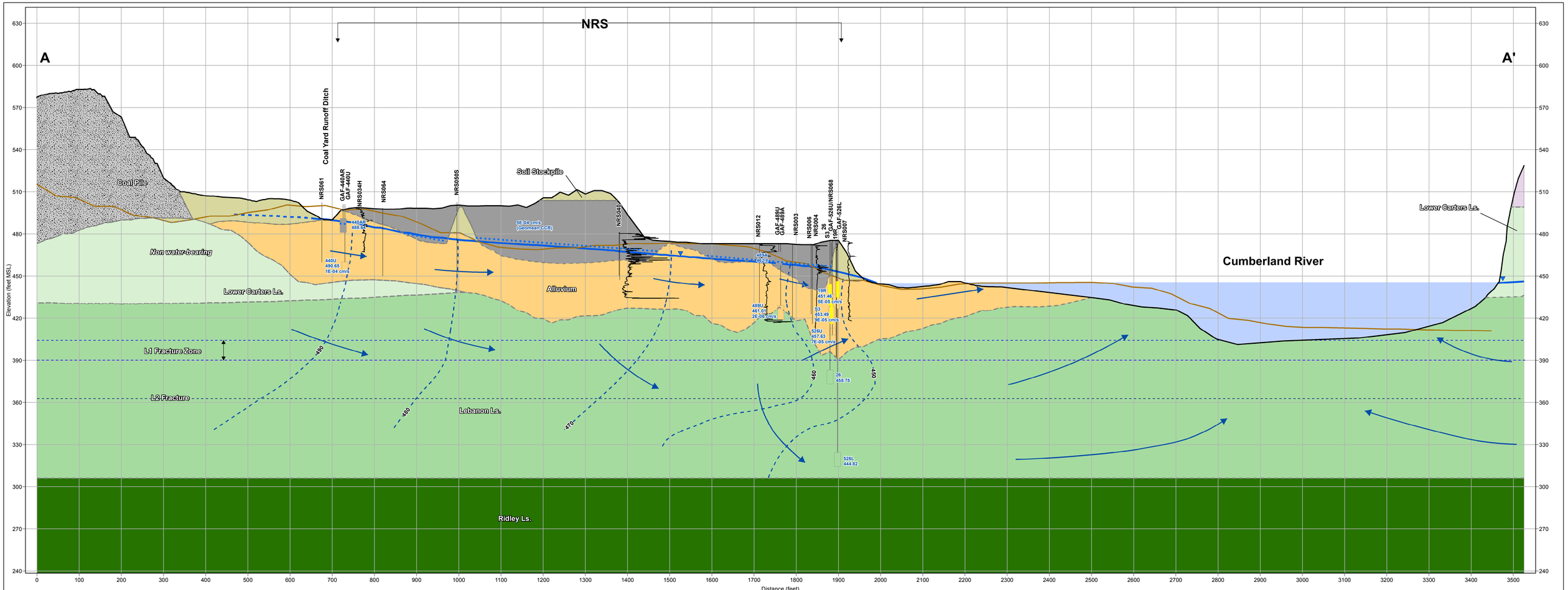
D. SCOTT	M. FRIEDMAN	M. STAUFFER	REV. 0

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE:	DEPT:
11/23/2020	FOSSIL AND HYDRO ENGINEERING



LEGEND

- Coal Pile
- Unconsolidated Material- Disturbed Native Alluvium, Fill and Mixture of Alluvium/Fill
- Unconsolidated Material – Fine-Grained Alluvium, Typically Silty Clay with Varying Content of Sand and Gravel, Residuum
- CCR
- Upper Carters Limestone
- Lower Carters Limestone
- Lebanon Limestone
- Ridley Limestone

Coarser Material Encountered in Boring: Unconsolidated Sand and Less Frequently, Gravel; Typically Very Silty and/or Clayey

- Well Screen
- Ground Surface
- Formation Contact
- 1952 Surface Topography
- Estimated Potentiometric Surface in Unconsolidated Material June 15, 2020; Dashed Where Inferred Due to Limited Data
- Estimated Phreatic Surface in CCR June 15, 2020

489U / 461.01 / 2E-06 cm/s — Monitoring Well ID and Potentiometric Surface (ft msl) in Well on June 15, 2020 Hydraulic conductivity from slug tests, low yield drawdown tests, or packer tests

- Groundwater Flow Direction
- 470' — Potentiometric Surface Contour (ft msl), June 15, 2020
- Approximate Location of Water Bearing Lebanon Ls. Fractures (L1)
- Approximate Location of Water Bearing Lebanon Ls. Fracture (L2)
- Electrical Conductivity (EC) Log in millisiemens/meter; scale varies at each location; response to right indicates increasing conductivity (e.g., clay).

Notes:
1. Lithology and top of rock interpretations at boring locations are based on boring logs and borehole geophysical data. Top of rock interpretations between borings are based on outcrops and topography.
2. Ground surface elevations derived from the 2017 LIDAR and 2016 River Bathymetry surveys.
3. Borings and wells are projected onto the cross section.

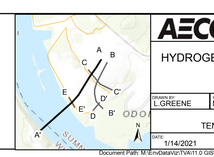


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Figure 3-3

HYDROGEOLOGIC CROSS SECTION A-A'
NRS

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L.GREENE	M. FRIEDMAN	M. STAUFFER	REV. 1

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE	UNIT
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NRS

B — **B'**

Elevation (feet MSL)

630 600 570 540 510 480 450 420 390 360 330 300 270

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900

Distance (feet)

Coal Pile

Non water-bearing

Lower Carters Ls.

Alluvium

Lebanon Ls.

Ridley Ls.

L1 Fracture Zone

L2 Fracture

NRS009
NRS065
NRS060
GAF-441L
GAF-441U
GAF-541U (NRS069)
Coal Yard Runoff Ditch
NRS008
NRS046
NRS013
GAF-442A
GAF-442U
NRS067
NRS054
GAF-444U
NRS053
Discharge Channel
Elevation 445 ft msl

5E-04 cm/s
(Geomean CCR)

442A
486.00

GP-5
476.03

441U
489.46
3E-06 cm/s

541U
489.37
9E-07 cm/s

441L
488.85
2E-06 cm/s

442U
468.60
5E-06 cm/s

444U
449.56
4E-06 cm/s

490 480 470 460 450

Notes:
1. Lithology and top of rock interpretations at boring locations are based on boring logs and borehole geophysical data. Top of rock interpretations between borings are based on outcrops and topography.
2. Ground surface elevations derived from the 2017 LIDAR and 2016 River Bathymetry surveys.
3. Borings and wells are projected onto the cross section.

LEGEND

- Coal Pile
- Unconsolidated Material- Disturbed Native Alluvium, Fill and Mixture of Alluvium/Fill
- Unconsolidated Material – Fine-Grained Alluvium, Typically Silty Clay with Varying Content of Sand and Gravel, Residuum
- CCR
- Lower Carters Limestone
- Lebanon Limestone
- Ridley Limestone

Coarser Material Encountered in Boring:

- Unconsolidated Sand and Less Frequently, Gravel; Typically Very Silty and/or Clayey
- Groundwater Flow Direction
- 489U / 461.01 / 2E-06 cm/s — Monitoring Well ID and Potentiometric Surface in Well on June 15, 2020 Hydraulic conductivity from slug tests, low yield drawdown tests, or packer tests
- Well Screen
- Ground Surface
- Formation Contact
- 1952 Surface Topography
- Estimated Potentiometric Surface in Unconsolidated Material June 15, 2020; Dashed Where Inferred Due to Limited Data
- Estimated Phreatic Surface in CCR June 15, 2020
- Approximate Location of Water Bearing Lebanon Ls. Fractures (L1)
- Approximate Location of Water Bearing Lebanon Ls. Fracture (L2)
- 470' — Potentiometric Surface Contour (ft msl), June 15, 2020
- Electrical Conductivity (EC) Log in millisiemens/meter; scale varies at each location; response to right indicates increasing conductivity (e.g., clay).

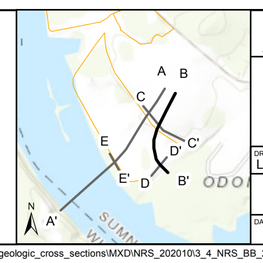

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Figure 3-4

HYDROGEOLOGIC CROSS SECTION B-B'
NRS

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
L.GREENE	M. FRIEDMAN	M. STAUFFER	REV. 1

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE: 1/14/2021

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C

C'

NRS062

NRS034H (No Boring Log)

NRS061

NRS035S

GAF-541U (NRS069)
GAF-441U
NRS060
GAF-441L

NRS036S

NRS058

NRS057

5E-04 cm/s
(Geomean CCR)

Refusal at 33'

Refusal at 42.5'

Refusal at 59'

441U
489.46
3E-06 cm/s

541U
489.37
9E-07 cm/s

Terminated at 70'

Refusal at 64'

Refusal at 74'

Refusal at 75'

Refusal at 70'

441L
488.85

L1 Fracture Zone

Elevation (feet MSL)

530
520
510
500
490
480
470
460
450
440
430
420
410
400
390
380

0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850 900 950 1000 1050 1100 1150 1200

Distance (feet)

Notes:
1. Lithology and top of rock interpretations at boring locations are based on boring logs and borehole geophysical data. Top of rock interpretations between borings are based on outcrops and topography.
2. Ground surface elevations derived from the 2017 LIDAR and 2016 River Bathymetry surveys.
3. Borings and wells are projected onto the cross section.

LEGEND

- Unconsolidated Material- Disturbed Native Alluvium, Fill and Mixture of Alluvium/Fill
- Unconsolidated Material – Fine-Grained Alluvium, Typically Silty Clay with Varying Content of Sand and Gravel, Residuum
- CCR
- Lower Carters Limestone
- Lebanon Limestone

Well or Soil Boring Lithology

- CCR
- Unconsolidated Sand and Less Frequently, Gravel; Typically Very Silty and/or Clayey
- Unconsolidated Fines, Predominantly Silt and/or Clay
- Lebanon Limestone

- Well Screen
- Ground Surface
- Formation Contact
- 1952 Surface Topography
- Estimated Potentiometric Surface in Unconsolidated Material June 15, 2020
- Estimated Phreatic Surface in CCR June 15, 2020; Interpolated from Well GAF-440AR

489U
461.01
2E-06 cm/s
Monitoring Well ID and Potentiometric Surface in Well on June 15, 2020
Hydraulic conductivity from slug tests, low yield drawdown tests, or packer tests

Approximate Location of Water Bearing Lebanon Ls. Fractures (L1)

Electrical Conductivity (EC) Log in millisiemens/meter; scale varies at each location; response to right indicates increasing conductivity (e.g., clay).

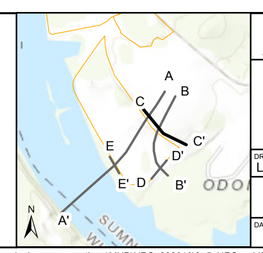

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Figure 3-5

HYDROGEOLOGIC CROSS SECTION C-C'
NRS

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
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GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

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D

D'

Elevation (feet MSL)

520
510
500
490
480
470
460
450
440
430
420
410
400
390

NRS056
NRS055
NRS070
GAF-444U
NRS054
NRS053
NRS052
NRS051
NRS067

Refusal at 69'
Refusal at 70'
Ended at 70'
Refusal at 71.5'
Refusal at 72'
Refusal at 66'
Refusal at 65'
Refusal at 39'
Refusal at 35.5'

444U
449.56
4E-06 cm/s

L1 Fracture Zone

Notes:
1. Lithology and top of rock interpretations at boring locations are based on boring logs and borehole geophysical data. Top of rock interpretations between borings are based on outcrops and topography.
2. Ground surface elevations derived from the 2017 LIDAR and 2016 River Bathymetry surveys.
3. Borings and wells are projected onto the cross section.

60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440

Distance (feet)

LEGEND

- Unconsolidated Material- Disturbed Native Alluvium, Fill and Mixture of Alluvium/Fill
- Unconsolidated Material – Fine-Grained Alluvium, Typically Silty Clay with Varying Content of Sand and Gravel, Residuum
- CCR
- Lower Carters Limestone
- Lebanon Limestone

Well or Soil Boring Lithology
- CCR
- Unconsolidated Sand and Less Frequently, Gravel; Typically Very Silty and/or Clayey
- Unconsolidated Fines, Predominantly Silt and/or Clay
- Lebanon Limestone

- Well Screen
- Ground Surface
- Formation Contact
- 1952 Surface Topography
- Estimated Potentiometric Surface in Unconsolidated Material June 15, 2020
- Estimated Phreatic Surface in CCR June 15, 2020

489U
461.01
2E-06 cm/s
Monitoring Well ID and Potentiometric Surface in Well on June 15, 2020
Hydraulic conductivity from slug tests, low yield drawdown tests, or packer tests

Approximate Location of Water Bearing Lebanon Ls. Fractures (L1)

Relative Permeability Log in mL/min/psi; represents the ratio of HPT flow maximum in milliliter/minute (mL/min) to corrected HPT pressure in pounds per square inch (psi); scale varies at each location; response to right represents highe permeability andresponse to left represents lower permeability

Electrical Conductivity (EC) Log in millisiemens/meter; scale varies at each location; response to right indicates increasing conductivity (e.g., clay).

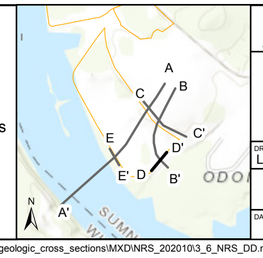

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Figure 3-6

HYDROGEOLOGIC CROSS SECTION D-D'
NRS

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L.GREENE	M. FRIEDMAN	M. STAUFFER	REV. 1

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

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E

E'

NRS002

NRS006

26

S3

GAF-526U (NRS068)

NRS004

19R

NRS007

GAF-526L

NRS005

NRS001

Refusal at 55.6'

Refusal at 55.7'

S3
453.49
9E-05 cm/s

19R
451.46
5E-05 cm/s

Refusal at 59.6'

526U
457.63
7E-05 cm/s

Refusal at 64.2'

Refusal at 61.7'

Refusal at 60.3'

L1 Fracture Zone

26
458.75

Terminated at 95'

Refusal at 103'

Terminated at 210'
Screened 314-324 ft msl

526L
444.82

L2 Fracture

Elevation (feet MSL)

490
480
470
460
450
440
430
420
410
400
390
380
370

0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400

Distance (feet)

Notes:
1. Lithology and top of rock interpretations at boring locations are based on boring logs and borehole geophysical data. Top of rock interpretations between borings are based on outcrops and topography.
2. Ground surface elevations derived from the 2017 LIDAR and 2016 River Bathymetry surveys.
3. Borings and wells are projected onto the cross section.

LEGEND

- Unconsolidated Material- Disturbed Native Alluvium, Fill and Mixture of Alluvium/Fill
- Unconsolidated Material – Fine-Grained Alluvium, Typically Silty Clay with Varying Content of Sand and Gravel, Residuum
- CCR
- Lower Carters Limestone
- Lebanon Limestone

Well or Soil Boring Lithology

- CCR
- Unconsolidated Sand and Less Frequently, Gravel; Typically Very Silty and/or Clayey
- Unconsolidated Fines, Predominantly Silt and/or Clay
- Lebanon Limestone

- Well Screen
- Ground Surface
- Formation Contact
- 1952 Surface Topography
- Estimated Potentiometric Surface in Unconsolidated Material June 15, 2020

489U
461.01
2E-06 cm/s
Monitoring Well ID and Potentiometric Surface in Well on June 15, 2020
Hydraulic conductivity from slug tests, low yield drawdown tests, or packer tests

Approximate Location of Water Bearing Lebanon Ls. Fractures (L1)

Electrical Conductivity (EC) Log in millisiemens/meter; scale varies at each location; response to right indicates increasing conductivity (e.g., clay).

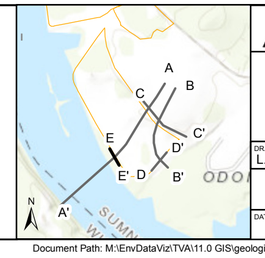

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Figure 3-7

HYDROGEOLOGIC CROSS SECTION E-E'
NRS

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L.GREENE	M. FRIEDMAN	M. STAUFFER	REV. 1

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE: 1/14/2021

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Well: GAF-447U Screen Elevation: 439-444

Date	pH	Be	Cd	Li	Ni
1/21/2020	6.5	0.182 U	0.217 U	3.39 U	8.1
4/23/2020	6.4	0.182 U	0.217 U	6.57 U*	7.26
6/17/2020	6.5	0.182 U	0.217 U	3.39 U	9.43
8/18/2020	6.7	0.182 U	0.217 U	3.39 U	11.9 J
10/19/2020	6.4	0.182 U	0.217 U	3.39 U	10.4

Well: 20 Screen Elevation: 421-431

Date	pH	Be	Cd	Li	Ni
1/16/2020	6.2	0.182 U	0.217 U	3.43 J	17.2
4/22/2020	6.0	0.182 U	0.217 U	8.22	20
6/17/2020	6.2	0.182 U	0.217 U	8.7	16.7
7/15/2020*	6.9	0.182 U	0.217 U	6.78	16.9
8/17/2020	6.2	0.182 U	0.217 U	5.05	18.5
10/21/2020	6.2	0.182 U	0.217 U	6.40	15.1

Well: 27 Screen Elevation: 386-396

Date	pH	Be	Cd	Li	Ni
1/14/2020*	6.8	0.182 U	0.217 U	6.11	0.916 J
4/22/2020	6.7	0.182 U	0.217 U	5.63	0.336 U
7/15/2020*	7.3	0.182 U	0.217 U	4.81 J	0.336 U
10/21/2020*	6.9	0.182 U	0.217 U	3.39 U	0.336 U

Well: GAF-448U Screen Elevation: 423-438

Date	pH	Be	Cd	Li	Ni
1/20/2020	6.9	0.182 U	0.217 U	3.39 U	0.558 J
4/23/2020	6.5	0.182 U	0.217 U	6.22 U*	0.605 J
6/17/2020	6.8	0.182 U	0.217 U	3.39 U	1.33
8/18/2020	6.1	0.182 U	0.217 U	3.39 U	0.8 J
10/19/2020	6.6	0.182 U	0.217 U	3.39 U	0.779 J

Well: S3 Screen Elevation: 418-428

Date	pH	Be	Cd	Li	Ni
1/20/2020	3.8	5.3	8.41	31.3	140
4/23/2020	3.8	4.61	8.45	33.6 U*	154
6/18/2020	3.7	4.9	8.46	32.6	150
8/19/2020	3.6	3.83	7.47	30	140
10/22/2020	4.1	4.37	7.90	29.0	140

Well: 26 Screen Elevation: 373-383

Date	pH	Be	Cd	Li	Ni
1/14/2020	7.2	0.427 J	0.217 U	4.97 J	5.08 J
4/22/2020	7.0	0.182 U	0.217 U	3.81 J	0.577 J
7/24/2020	7.1	0.182 U	0.217 U	3.39 U	0.682 J
10/21/2020	7.7	0.182 U	0.217 U	3.39 U	0.357 J

Well: 19R Screen Elevation: 427-437

Date	pH	Be	Cd	Li	Ni
1/15/2020	3.5	13.3	4.65	146	191
4/22/2020	3.4	12.6	4.89	123	156
6/16/2020*	3.8	12.5	4.4	130	159
7/14/2020	4.1	13.5	5.79	126	176 J
8/17/2020	3.6	11.2	3.71	129	131
10/21/2020	3.6	12.4	4.54	131	140

Well: GAF-440U Screen Elevation: 450-460

Date	pH	Be	Cd	Li	Ni
1/17/2020	6.7	0.215 J	0.217 U	4.79 J	9.98
4/23/2020	6.5	0.182 U	0.217 U	6.91 U*	5.96
6/18/2020	6.5	0.182 U	0.217 U	3.39 J	7.31
8/19/2020	6.8	0.182 U	0.217 U	3.39 U	6.64
10/20/2020	6.7	0.182 U	0.217 U	3.39 U	5.52

Well: GAF-439U Screen Elevation: 438-443

Date	pH	Be	Cd	Li	Ni
1/21/2020	6.9	0.199 U*	0.217 U	3.6 J	1.74
4/22/2020	6.7	0.182 U	0.217 U	5	2.21
6/19/2020	6.6	0.182 U	0.217 U	3.9 J	2.29
8/20/2020	6.7	0.182 U	0.217 U	4.08 J	2.19
10/19/2020	6.7	0.182 U	0.217 U	3.39 U	2.64

Well: GAF-541U Screen Elevation: 438-443

Date	pH	Be	Cd	Li	Ni
4/24/2020	6.0	0.182 U	0.217 U	34.7	345
6/17/2020	6.1	0.182 U	0.217 U	30.2	241
8/18/2020	5.9	0.182 U	0.217 U	25.2	225
10/22/2020*	6.1	0.182 U	0.217 U	26.6	325

Well: GAF-526U Screen Elevation: 408-413

Date	pH	Be	Cd	Li	Ni
4/23/2020	6.8	0.182 U	0.217 U	11 U*	3.03
6/18/2020	6.8	0.182 U	0.217 U	4.76 J	4.57
8/19/2020	6.8	0.182 U	0.217 U	4.42 J	3.58
10/19/2020	7.1	0.182 U	0.217 U	3.55	2.60

Well: GAF-489U Screen Elevation: 419-429

Date	pH	Be	Cd	Li	Ni
1/21/2020	6.1	0.182 U	0.217 U	3.39 U	3.2 J
4/23/2020	5.8	0.182 U	0.217 U	6.23 U*	1.6
6/18/2020	5.6	0.182 U	0.217 U	3.39 U	2.26
8/20/2020	5.5	0.182 U	0.217 U	3.39 U	1.21
10/22/2020	5.8	0.182 U	0.217 U	3.39 U	1.92

Well: GAF-441U Screen Elevation: 451-461

Date	pH	Be	Cd	Li	Ni
1/16/2020	3.5	18.6	11.8 J	16.4	705
4/24/2020	3.3	17.2	15	17 U	771
6/17/2020	3.3	14.8	19.9	17 U	887
8/18/2020	2.7	12.4	13.9	33.9 U	762
10/22/2020	3.7	13.1	8.23	13.4	612

Well: GAF-442U Screen Elevation: 439-449

Date	pH	Be	Cd	Li	Ni
1/17/2020	6.5	0.182 U	0.217 U	3.39 U	1.42
4/22/2020	6.3	0.182 U	0.217 U	3.39 U	5.69 J
6/18/2020	6.3	0.182 U	0.217 U	3.39 U	1.39
8/19/2020	6.9	0.182 U	0.217 U	3.39 U	1.5
10/20/2020	6.3	0.182 U	0.217 U	3.39 U	1.49

Well: GAF-444U Screen Elevation: 423-433

Date	pH	Be	Cd	Li	Ni
1/20/2020	4.1	11.7	7.22	35.9	643
4/24/2020	4.3	9.2	9.79	30.7	520
6/16/2020	4.5	7.58	9.17	31.5	552
8/19/2020	6.5	7.36	9.6	31.6	522
10/22/2020	4.2	8.44	9.26	31.2	536

Well: 22 Screen Elevation: 421-431

Date	pH	Be	Cd	Li	Ni
1/16/2020	7.4	0.182 U	0.217 U	3.39 U	0.336 U
4/23/2020	7.1	0.182 U	0.217 U	6.55 U*	0.336 U
6/16/2020	7.4	0.182 U	0.217 U	3.39 U	0.336 U
7/15/2020*	7.7	0.182 U	0.217 U	3.39 U	0.336 U
8/18/2020	7.1	0.182 U	0.217 U	3.39 U	0.336 U
10/21/2020	7.0	0.182 U	0.217 U	3.39 U	0.336 U

NOTE: Aerial image dated February 2017

NOTES:
- -Target metals are beryllium (Be), cadmium (Cd), lithium (Li), and nickel (Ni)
- * Only total metals analysis was available for the well on this sampling date.
- -Results are in micrograms per liter (ug/l)
- -CCR - Coal Combustion Residuals
- -ft bgs - feet below ground surface

Groundwater Protection Standards

Be	4 ug/L	J =	Quantitation is approximate due to limitations identified during data validation.
Cd	5 ug/L	U =	Non detection at the concentration noted
Li	40 ug/L	U*=	This result should be considered “not detected” because it was detected in a rinsate blank or laboratory blank at a similar level.
Ni	100 ug/L		

- -The field PH reading for well GAF-444U in August 2020 is understood to be an instrument error, as the groundwater was retested on receipt by AECOM's treatability laboratory and was found to have a typical low pH for that well.
- -Red - concentration exceeds its applicable groundwater protection standard or, if pH, is ≤ 5.5

Screen elevation in feet mean sea level (msl)

445-449 Groundwater sample interval elevation (ft msl)

0 200 400 Feet

LEGEND:
- Direct Push Boring Location
- Well Screened in Unconsolidated Material
- Well Screened in Lebanon Limestone
- Well Screened in CCR
- Well Screened in Carters Limestone
- Approximate Eastern Extent of Saturated Overburden near the NRS
- CCR Management Units
- Primary Pyritic Sulfur Area - Area of NRS where pyritic sulfur exists at some of the highest mass fractions (up to 3.02%), in both the unsaturated and saturated zones, and to the greatest depth (25 ft bgs)

AECOM

Figure 4-1a

DISTRIBUTION OF PH AND DISSOLVED TARGET METALS IN MONITORING WELLS, 2020

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
T.ADHAM	M.FRIEDMAN	M.STAUFFER	REV. 0

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE: 1/14/2021 DEPT: FOSSIL AND HYDRO ENGINEERING

Document Path: K:\TVA_GAF\NRS\920 - GIS\NRS_GW_ANALYTICAL_RESULTS_4_1_a.mxd

Boring: NRS062

Date	Elev	pH	Be	Cd	Li	Ni
1/30/2020	470-474	6.5	0.182 U	0.217 J	9.69	40.9

Boring: NRS061

Date	Elev	pH	Be	Cd	Li	Ni
1/31/2020	484-488	6.2	21.2 J	10.9 U	338	237
1/31/2020	460-464	5.9	6.01	6.19	51.4	523

Boring: NRS064

Date	Elev	pH	Be	Cd	Li	Ni
2/4/2020	483-487	10.2	0.182 U	0.217 U	53.1	0.995 J
2/5/2020	450-454	8.5	NS	NS	NS	NS

Boring: NRS060

Date	Elev	pH	Be	Cd	Li	Ni
1/31/2020	481-485	4.9	3.52	3.24	167	204
2/3/2020	426-430	5.1	31 J	86.2	170 U	4000

Boring: NRS058

Date	Elev	pH	Be	Cd	Li	Ni
2/3/2020	481-485	6.5	0.182 U	0.217 U	285	6.48
2/3/2020	438-442	6.6	NS	NS	NS	NS

Boring: NRS059

Date	Elev	pH	Be	Cd	Li	Ni
2/4/2020	460-464	6.5	0.182 U	0.221 J	4.82 J	26.7

Boring: NRS065

Date	Elev	pH	Be	Cd	Li	Ni
2/4/2020	455-459	8.7	1.58	0.217 U	18.1	29.7

Boring: NRS057

Date	Elev	pH	Be	Cd	Li	Ni
2/3/2020	481-485	5.6	1.23	0.998 J	229	51.1

Boring: NRS052

Date	Elev	pH	Be	Cd	Li	Ni
1/30/2020	445-449	7.0	0.182 U	0.217 U	3.39 U	11.1
1/30/2020	419-423	*dry*	*dry*	*dry*	*dry*	*dry*

Boring: NRS054

Date	Elev	pH	Be	Cd	Li	Ni
1/29/2020	449-453	*dry*	*dry*	*dry*	*dry*	*dry*
1/29/2020	417-421	7.0	0.229 J	1.25	20.8	311

Boring: NRS051

Date	Elev	pH	Be	Cd	Li	Ni
1/30/2020	445-449	*dry*	*dry*	*dry*	*dry*	*dry*

Boring: NRS055

Date	Elev	pH	Be	Cd	Li	Ni
1/28/2020	449-453	*dry*	*dry*	*dry*	*dry*	*dry*
1/28/2020	434-438	*dry*	*dry*	*dry*	*dry*	*dry*
1/28/2020	413-417	6.5	6.28	20.3	25.7	142

Boring: NRS053

Date	Elev	pH	Be	Cd	Li	Ni
1/29/2020	412-416	6.8	11.1	54.2	7.98	51.2

Boring: NRS056

Date	Elev	pH	Be	Cd	Li	Ni
1/27/2020	448-452	*dry*	*dry*	*dry*	*dry*	*dry*
1/27/2020	433-437	*dry*	*dry*	*dry*	*dry*	*dry*
1/27/2020	413-417	7.5	0.182 U	0.217 U	3.39 U	10.9

NOTE: Aerial image dated February 2017

NOTES:
Target metals are beryllium (Be), cadmium (Cd), lithium (Li), and nickel (Ni)
Elev - elevation range of the sampled interval, in feet mean sea level
In Situ groundwater and CCR pore water samples contained some visibile turbidity after filtering, thus the dissolved concentrations shown may be biased high.

Groundwater Protection Standards

Be	4 ug/L	J =	Quantitation is approximate due to limitations identified during data validation.
Cd	5 ug/L	U =	Non detection at the concentration noted
Li	40 ug/L	U*=	This result should be considered "not detected" because it was detected in a rinsate blank or laboratory blank at a similar level.
Ni	100 ug/L		

Red - concentration exceeds its applicable groundwater protection standard or, if pH, is ≤ 5.5
dry - water not present in the interval after at least 1 hour

Results are in micrograms per liter (ug/l)
CCR - Coal Combustion Residuals
ft bgs - feet below ground surface

LEGEND:
- Direct Push Boring Location
- Well Screened in Unconsolidated Material
- Well Screened in Lebanon Limestone
- Well Screened in CCR
- Well Screened in Carters Limestone
- CCR Management Units
- Approximate Eastern Extent of Saturated Overburden near the NRS
- Primary Pyritic Sulfur Area - Area of NRS where pyritic sulfur exists at some of the highest mass fractions (up to 3.02%), in both the unsaturated and saturated zones, and to the greatest depth (25 ft bgs)

AECOM

Figure 4-1b

DISTRIBUTION OF PH AND DISSOLVED TARGET METALS IN IN SITU GROUNDWATER AND CCR PORE WATER SAMPLES 2020

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
T.ADHAM	M.FRIEDMAN	M.STAUFFER	REV. 0

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE: 1/14/2021
DEPT: FOSSIL AND HYDRO ENGINEERING

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LEGEND:

- Direct Push Boring Location, 2020 Investigation
- Direct Push Boring Location, 2015 Investigation
- TVA Gallatin Fossil Plant Property Boundary (Approximate)
- Approximate Eastern Extent of Saturated Overburden near the NRS
- CCR Management Units
- Primary Pyritic Sulfur Area - Area of NRS where pyritic sulfur exists at some of the highest mass fractions (up to 3.02%), in both the unsaturated and saturated zones, and to the greatest depth (25 ft bgs)
- Well Screened in Unconsolidated Material
- Well Screened in Lebanon Limestone
- Well Screened in CCR
- Well Screened in Carters Limestone
- Boring Location and Maximum Depth (ft)
- 6' Where PAG Material was Encountered

Note:
The direct push boring locations shown had one or more sample analyzed for acid-base accounting
CCR - Coal Combustion Residuals
ft bgs - feet below ground surface

N

0 200 400
Feet

AECOM

Figure 4-1c

LOCATION OF POTENTIALLY ACID GENERATING (PAG) MATERIAL

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
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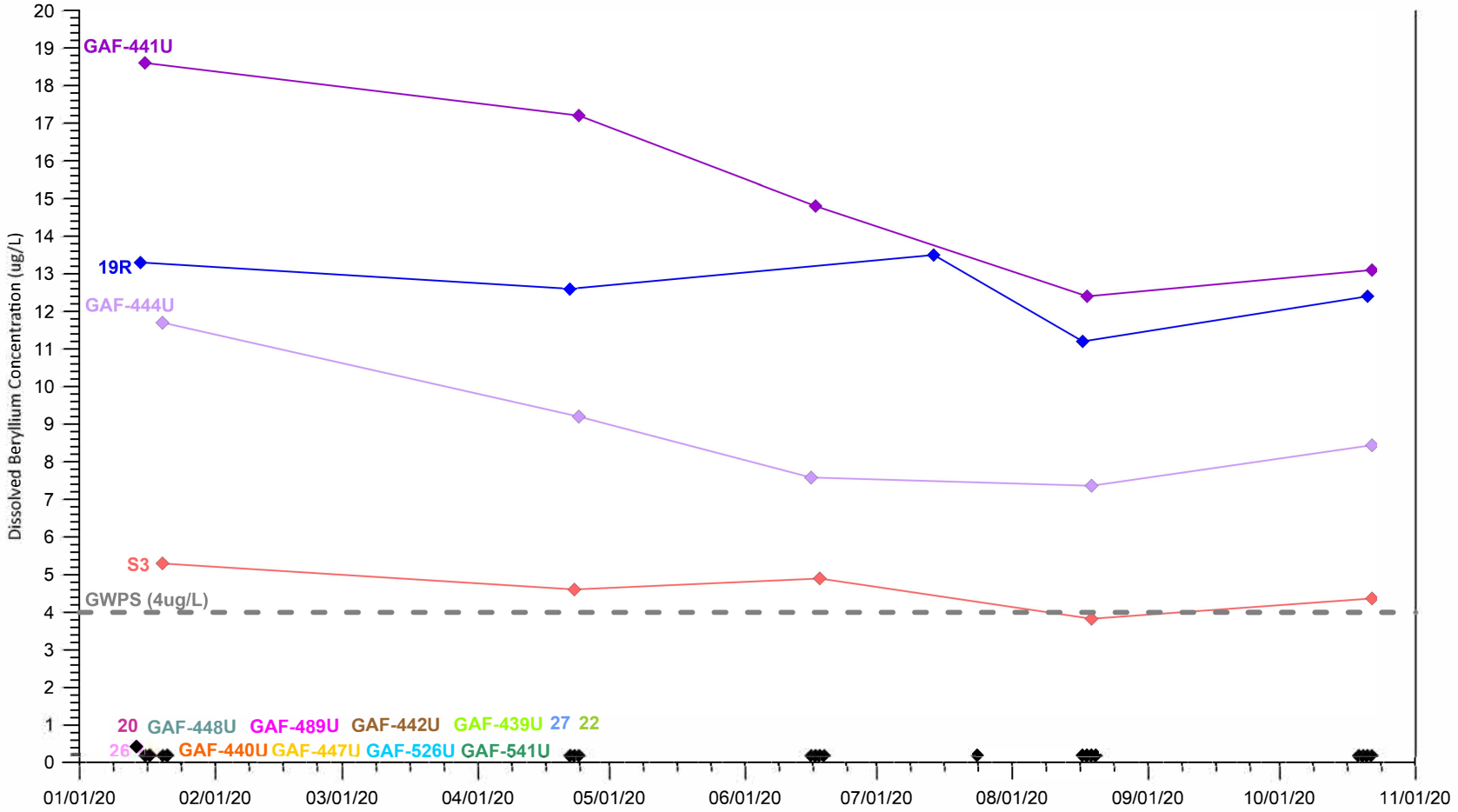
GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE: 1/14/2021

DEPT: FOSSIL AND HYDRO ENGINEERING

Document Path: K:\TVA_GAF\NRS\920 - GIS\NRS_GW_ANALYTICAL_RESULTS_4_1_c.mxd



LEGEND

- Beryllium Concentration in Well Indicated
- Non-detect Concentration Results (including results qualified as non detect due to detections in a blank [U* results in data table])
- Groundwater Protection Standard (4 ug/L)

AECOM

Figure 4-2a

DISSOLVED BERYLLIUM TIME SERIES GRAPH - UNCONSOLIDATED MATERIALS

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
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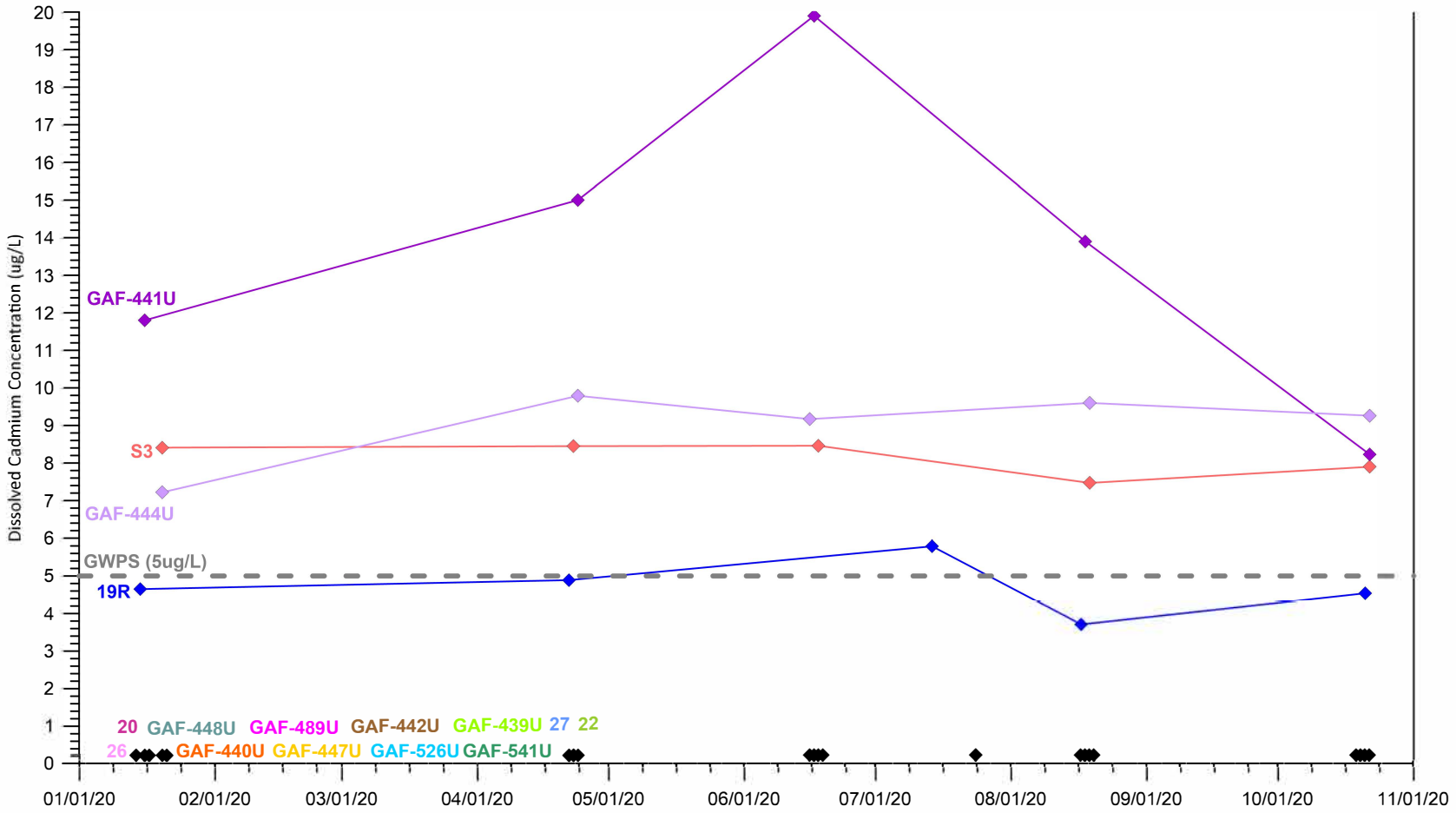
GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE:	DEPT:
11/30/2020	FOSSIL AND HYDRO ENGINEERING



LEGEND

- Cadmium Concentration in Well Indicated
- Non-detect Concentration Results (including results qualified as non detect due to detections in a blank [U* results in data table])
- Groundwater Protection Standard (5 ug/L)

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Figure 4-2b

DISSOLVED CADMIUM TIME SERIES GRAPH - UNCONSOLIDATED MATERIALS

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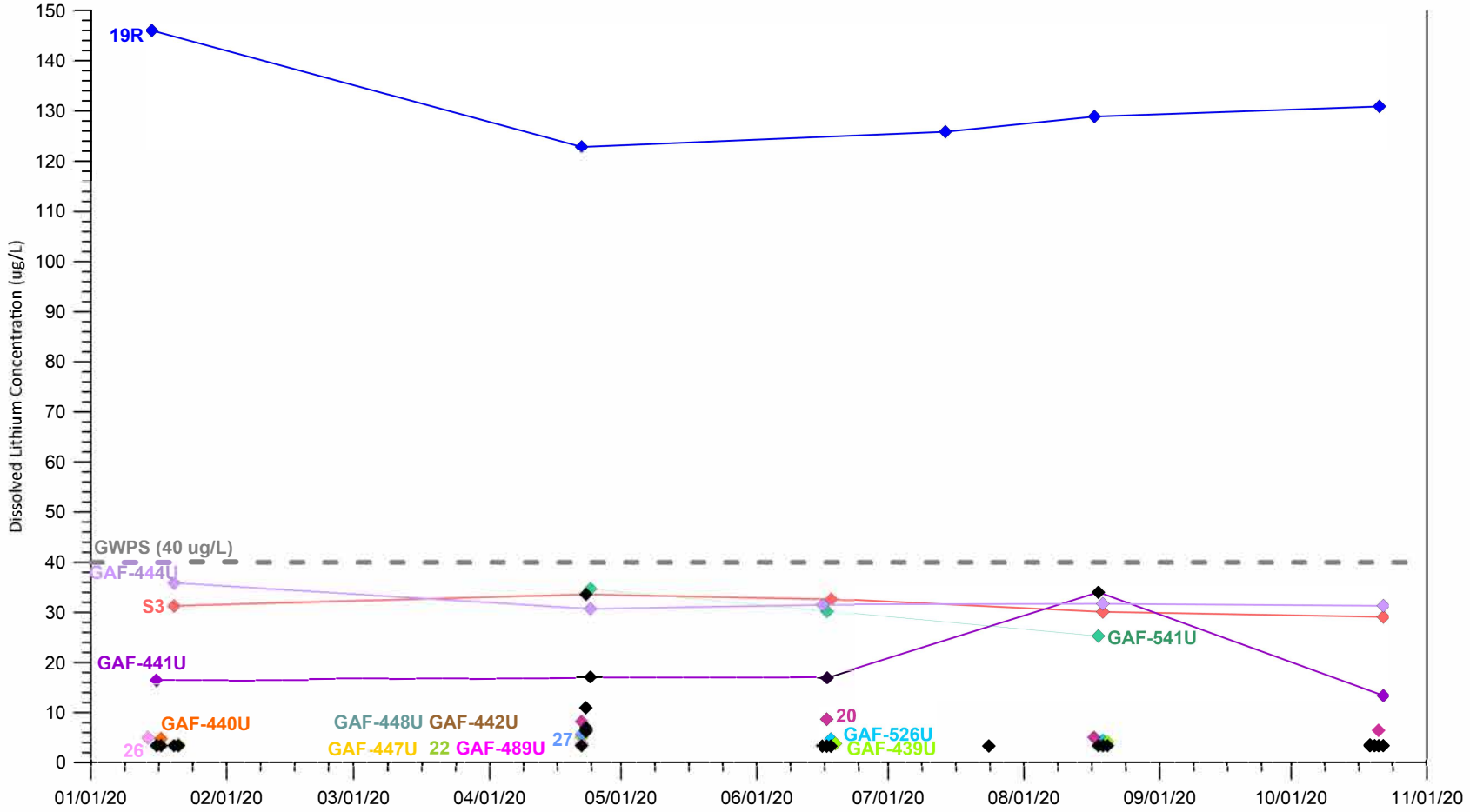
GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE:	DEPT:
11/30/2020	FOSSIL AND HYDRO ENGINEERING



LEGEND

- Lithium Concentration in Well Indicated
- Non-detect Concentration Results (including results qualified as non detect due to detections in a blank [U* results in data table])
- Groundwater Protection Standard (40 ug/L)

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Figure 4-2c

DISSOLVED LITHIUM TIME SERIES GRAPH - UNCONSOLIDATED MATERIALS

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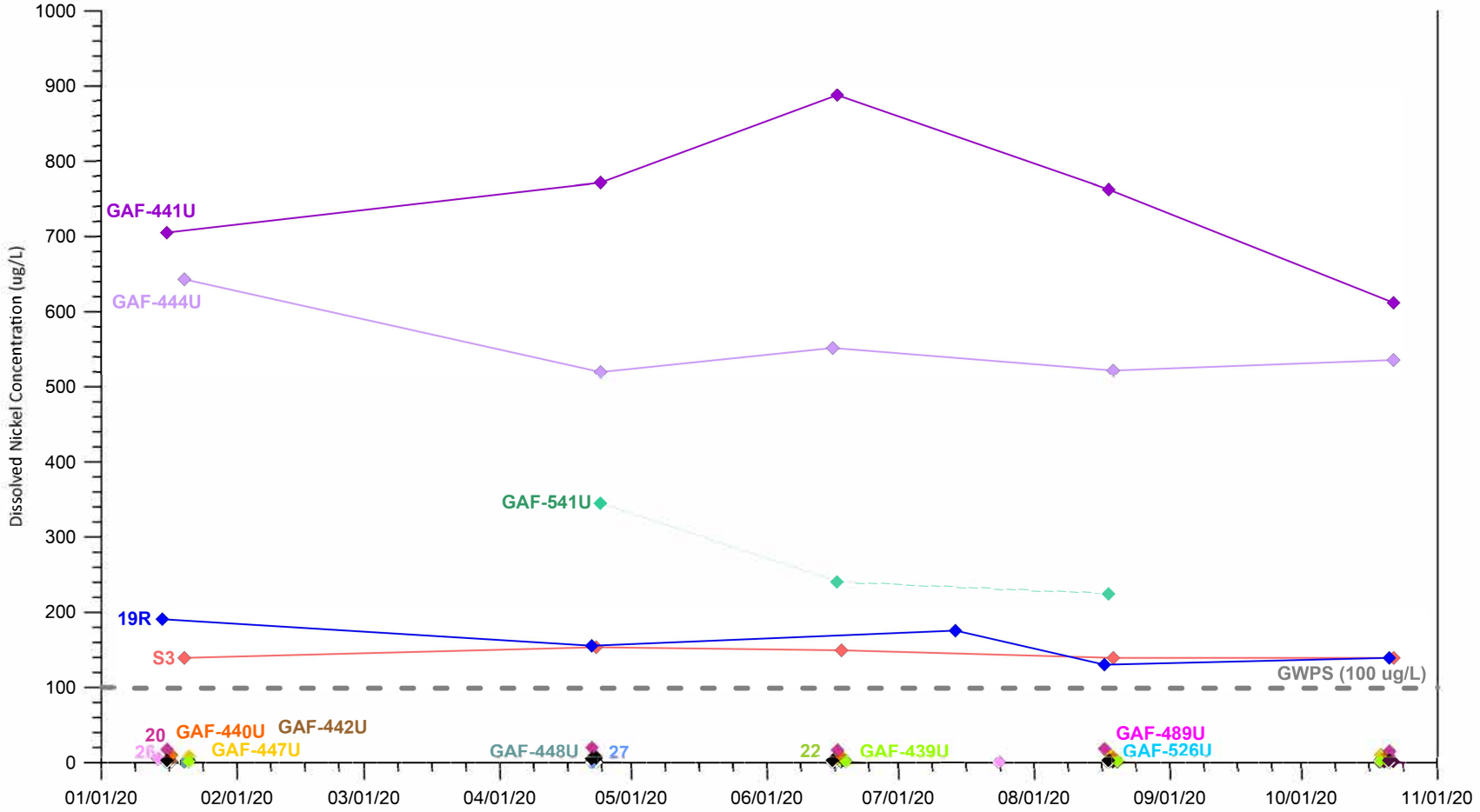
GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE:	DEPT:
11/30/2020	FOSSIL AND HYDRO ENGINEERING



LEGEND

- Nickel Concentration in Well Indicated
- Non-detect Concentration Results (including results qualified as non detect due to detections in a blank [U* results in data table])
- Groundwater Protection Standard (100 ug/L)

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Figure 4-2d

DISSOLVED NICKEL TIME SERIES GRAPH - UNCONSOLIDATED MATERIALS

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GALLATIN FOSSIL PLANT
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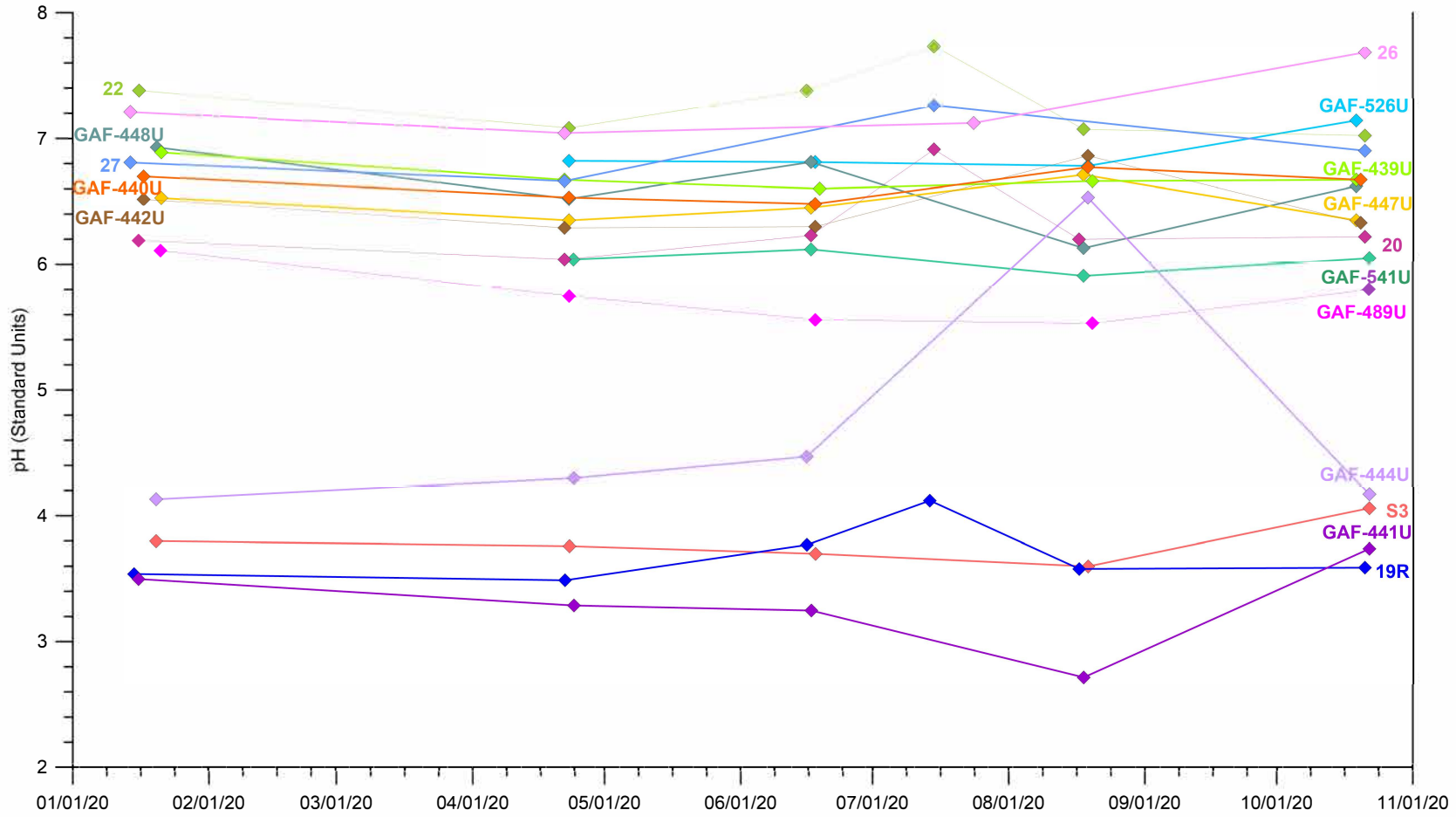

LEGEND

◆ pH in Well Indicated

Note: The field pH reading for well GAF-444U in August 2020 is understood to be an instrument error, as the groundwater was retested by AECOM's treatability laboratory and was found to have low pH typical for that well.

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Figure 4-2e

pH TIME SERIES GRAPH - UNCONSOLIDATED MATERIALS

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D. SCOTT	M. FRIEDMAN	M. STAUFFER	REV. 0

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DATE	DEPT
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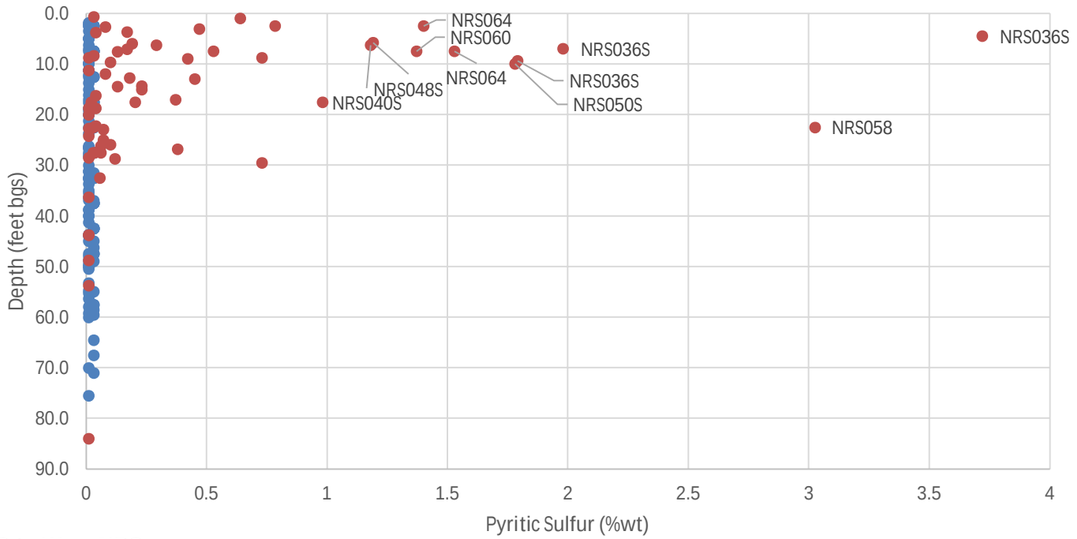
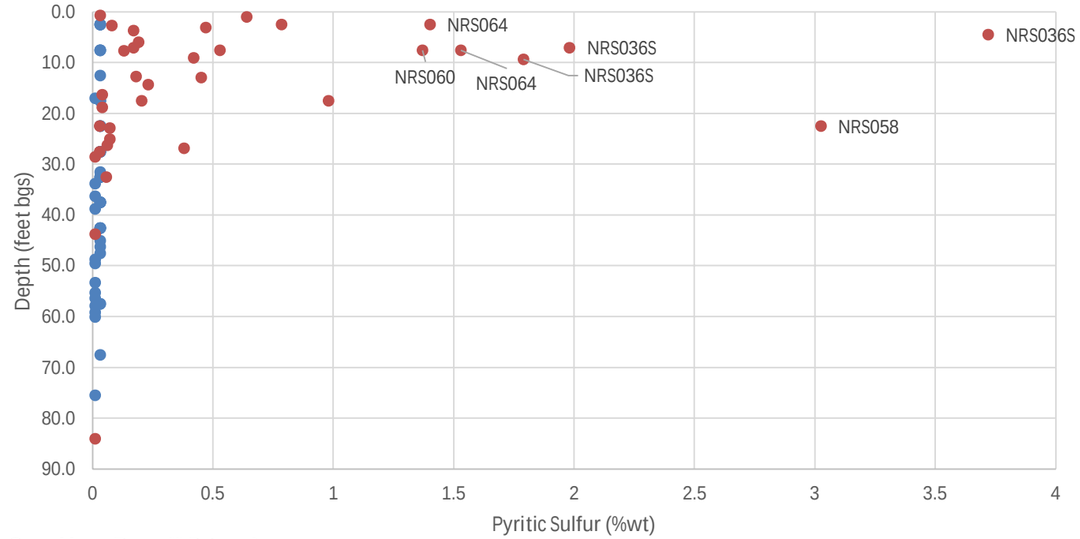


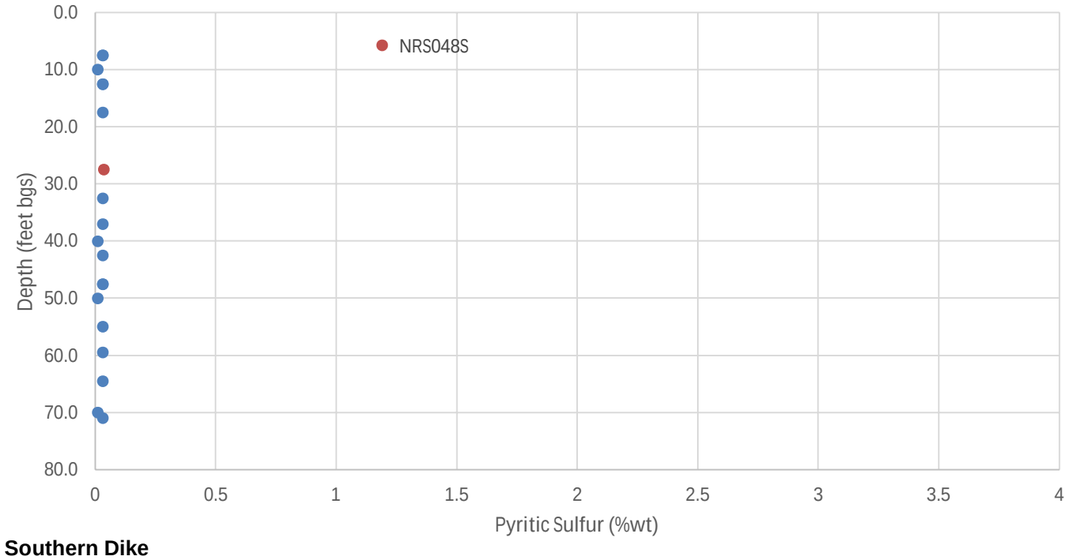
a. Site-Wide NRS

Of 190 samples collected for pyritic sulfur, pyritic sulfur was detected in 64 samples.



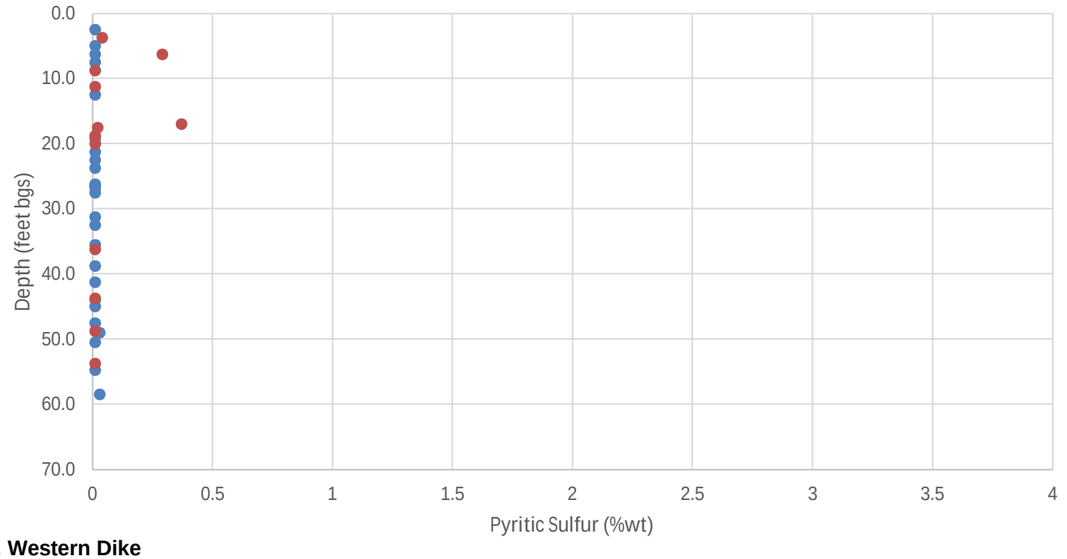
b. Coal Yard Runoff Ditch Area

This chart includes borings NRS008S, NRS033S, NRS036S, NRS046S, NRS047, NRS057 to NRS062, NRS064, NRS066 and NRS069



c. Southern Dike

This chart includes borings NRS048S, NRS051 to NRS056, NRS067, and NRS070



d. Western Dike

This chart includes borings NRS001S, NRS002S, NRS012S, NRS017S, NRS018S, NRS049S, and NRS068

NRS - Non-Registered Site
%wt - Percent Weight
feet bgs - feet below ground surface
Blue dot - Pyritic sulfur was not detected above the reporting limit shown.
Red dot - Pyritic sulfur was detected at the value shown.
Labels indicate the boring location of the sample with a detection of pyritic sulfur above 1 %wt

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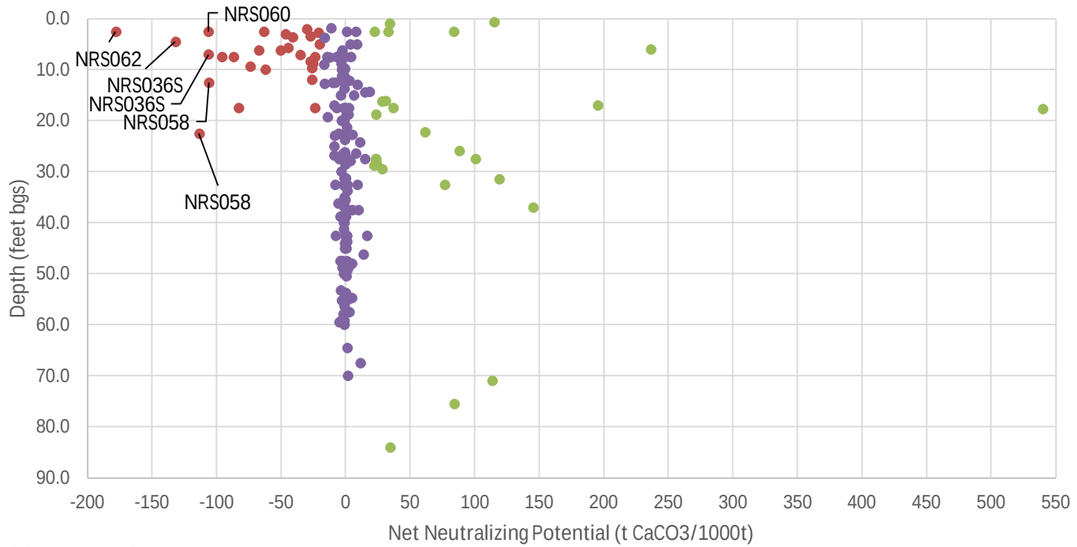
FIGURE 4-3

PYRITIC SULFUR VS. DEPTH

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
M FRIEDMAN		M STAUFFER	1

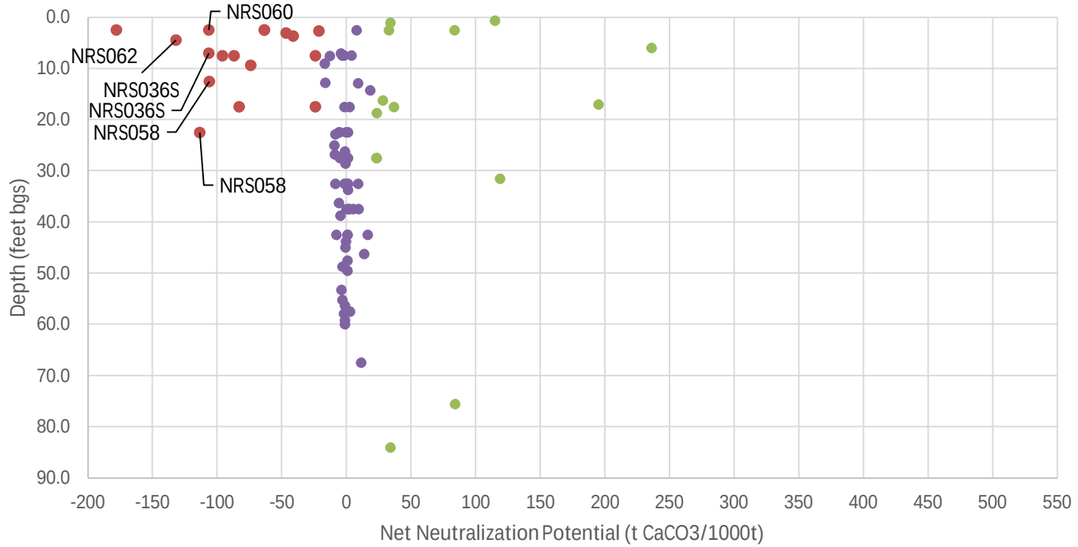
GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE:	DEPT:
12/2/2020	FOSSIL AND HYDRO ENGINEERING



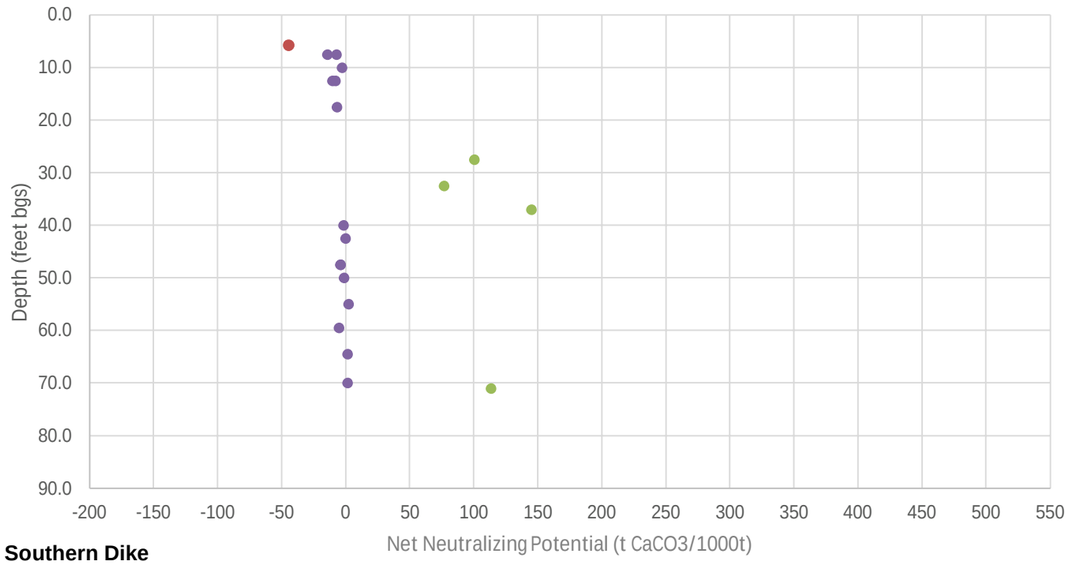
a. Site-Wide NRS

NNP was analyzed in 190 samples collected from 42 borings in and around the NRS



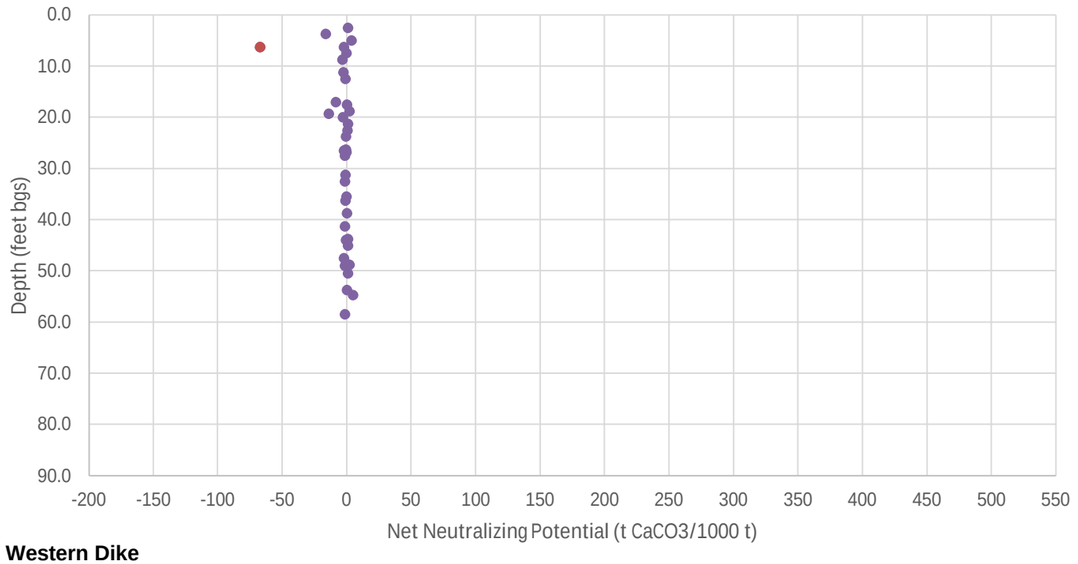
b. Coal Yard Runoff Ditch Area

This chart includes borings NRS008S, NRS033S, NRS036S, NRS046S, NRS047, NRS057 to NRS062, NRS064, NRS066 and NRS069



c. Southern Dike

This chart includes borings NRS048S, NRS051 to NRS056, NRS067, and NRS070



d. Western Dike

This chart includes borings NRS001S, NRS002S, NRS012S, NRS017S, NRS018S, NRS049S, and NRS068

NRS - Non-Registered Site
NNP - Net neutralizing potential
t CaCO3/ 1000t - tons of calcium carbonate per 1,000 tons of rock.
ft bgs - feet below ground surface
Green dot - NNP value greater than 20 t CaCO3/ 1000t, potentially non-acid generating (NAG)
Purple dot - NNP value equal to or greater than -20 t CaCO3/1000t and less than or equal to 20 t CaCO3/ 1000t, acid or neutralizing potential is uncertain
Red dot - NNP value less than -20 t CaCO3/ 1000t, potentially acid generating (PAG)
Labels indicate the boring location of the sample with a detection of NNP less than -100 t CaCO3/1000t

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FIGURE 4-4

NET NEUTRALIZING POTENTIAL VS. DEPTH

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
M FRIEDMAN		M STAUFFER	2

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE:	DEPT:
1/14/2021	FOSSIL AND HYDRO ENGINEERING

C

C'

NRS062

NRS061

NRS0035S

GAF-441U
GAF-541U (NRS069)
NRS060
GAF-441L

NRS058

NRS057

Elevation (feet MSL)

530
520
510
500
490
480
470
460
450
440
430
420
410
400
390
380

pH 6.5
Be <0.18
Cd <0.22
Li 9.69
Ni 40.9

Refusal at 33'

pH 6.2
Be 21.2 J
Cd <10.9
Li 338
Ni 237

pH 5.9
Be 6.01
Cd 6.19
Li 51.4
Ni 523

Refusal at 42.5'

pH 4.9
Be 3.52
Cd 3.24
Li 167
Ni 204

pH 3.5
Be 18.6
Cd 11.8 J
Li 16.4
Ni 705

pH 6.0
Be <0.18
Cd <0.22
Li 34.7
Ni 345

Terminated at 70'

pH 5.11
Be 31 J
Cd 86.2
Li <170
Ni 4000

Refusal at 75'

pH 7.1
Be <1
Cd <1
Li 3.76
Ni <1

pH 6.5
Be <0.18
Cd <0.22
Li 285
Ni 6.48

pH 6.6

Refusal at 64'

pH 5.6
Be 1.23
Cd 0.998 J
Li 229
Ni 51.1

Refusal at 70'

Notes:
1. Lithology and top of rock interpretations at boring locations are based on boring logs and borehole geophysical data. Top of rock interpretations between borings are based on outcrops and topography.
2. Ground surface elevations derived from the 2017 LIDAR and 2016 River Bathymetry surveys.
3. Groundwater and soil analytical results based on data collected from January and February 2020 except GAF-441L (January 2017) and GAF-541U (April 2020).
4. Borings and wells are projected onto the cross section.
5. GWPS = groundwater protection standards
6. Filtered (dissolved) analytical results are presented on this figure for beryllium (Be), cadmium (Cd), lithium (Li) and nickel (Ni).

0 50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850 900 950 1000 1050 1100 1150 1200
Distance (feet)

LEGEND

- Unconsolidated Material - Disturbed Native Alluvium, Fill and Mixture of Alluvium/Fill
- Unconsolidated Material - Fine-Grained Alluvium Typically Silty Clay with Varying Content of Sand and Gravel, Residuum
- CCR
- Lower Carters Limestone
- Lebanon Limestone

Well Screen

Well or Soil Boring Lithology
- CCR
- Unconsolidated Sand and Less Frequently, Gravel; Typically Very Silty and/or Clayey
- Unconsolidated Fines, Predominantly Silt and/or Clay
- Lebanon Limestone

Soil Acid Base Accounting Net Neutralization Potential (NNP) Results
- Potentially acid generating NNP < -20
- Uncertain acid generating potential -20 ≤ NNP ≤ +20
- Potentially acid neutralizing NNP > 20
- Estimated Phreatic Surface in CCR June 15, 2020; Interpolated from Well GAF-440AR

- pH ≤ 5
- 5 < pH < 6
- pH ≥ 6
- S Pyritic sulfur detected from 0.37-3.72%
- S Pyritic sulfur detected from 0.03-0.29%
- S Pyritic sulfur <0.03%

- Ground Surface
- Formation Contact
- 1952 Surface Topography
- Estimated Potentiometric Surface in Unconsolidated Material June 15, 2020

Dissolved Groundwater Concentrations (ug/L)

pH
Beryllium (Be)
Cadmium (Cd)
Lithium (Li)
Nickel (Ni)

Concentrations are shown in red if they are at or above the GWPS of 4 ug/L Be, 5 ug/L Cd, 40 ug/L Li, and 100 ug/L Ni. pH values are shown in red if value is at or below 5.5

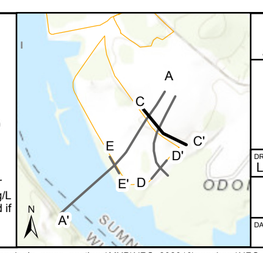

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Figure 4-5

GEOCHEMICAL CROSS SECTION C-C' NRS

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
L.GREENE	M. FRIEDMAN	M. STAUFFER	REV. 1

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE: 1/14/2021

DEPT: FOSSIL AND HYDRO ENGINEERING

Document Path: M:\EnvDataViz\TVA\11.0 GIS\geologic_cross_sections\MXD\NRS_202010\geochem\NRS_ccV3geochem.mxd

D

D'

NRS056

NRS055

NRS070

GAF-444U

NRS054

NRS053

NRS052

NRS051

NRS067

pH 7.5
Be <0.18
Cd <0.22
Li <0.22
Ni 3.39

Refusal at 69'

pH 6.5
Be 6.28
Cd 20.3
Li 25.7
Ni 142

Refusal at 70'

Ended at 70'

pH 4.1
Be 11.7
Cd 7.2
Li 35.9
Ni 643

Refusal at 71.5'

pH 7.0
Be 0.2J
Cd 1.25
Li 20.8
Ni 311

Refusal at 66'

pH 6.8
Be 11.1
Cd 54.2
Li 7.98
Ni 51.2

Refusal at 72'

pH 7.0
Be <0.18
Cd <0.22
Li <3.39
Ni 11.1

Refusal at 39'

Refusal at 65'

Refusal at 35.5'

Elevation (feet MSL)

520
510
500
490
480
470
460
450
440
430
420
410
400
390

0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400

Distance (feet)

Notes:
1. Lithology and top of rock interpretations at boring locations are based on boring logs and borehole geophysical data. Top of rock interpretations between borings are based on outcrops and topography.
2. Ground surface elevations derived from the 2017 LIDAR and 2016 River Bathymetry surveys.
3. Groundwater and soil analytical results based on data collected from January and February 2020.
4. Borings and wells are projected onto the cross section.
5. GWPS = groundwater protection standards
6. Filtered (dissolved) analytical results are presented on this figure for beryllium (Be), cadmium (Cd), lithium (Li) and nickel (Ni).

LEGEND

- Unconsolidated Material - Disturbed Native Alluvium, Fill and Mixture of Alluvium/Fill
- Unconsolidated Material - Fine-Grained Alluvium Typically Silty Clay with Varying Content of Sand and Gravel, Residuum
- CCR
- Lower Carters Limestone
- Lebanon Limestone

Well Screen

Well or Soil Boring Lithology

- CCR
- Unconsolidated Sand and Less Frequently, Gravel; Typically Very Silty and/or Clayey Unconsolidated Fines, Predominantly Silt and/or Clay
- Lebanon Limestone

Soil Acid Base Accounting Net Neutralization Potential (NNP) Results

- Potentially acid generating NNP < -20
- Uncertain acid generating potential -20 ≤ NNP ≤ +20
- Potentially acid neutralizing NNP > 20
- Estimated Phreatic Surface in CCR June 15, 2020

- pH ≤ 5
- 5 < pH < 6
- pH ≥ 6
- S — Pyritic sulfur detected from 0.37-3.72%
- S — Pyritic sulfur detected from 0.03-0.29%
- S — Pyritic sulfur <0.03%

- Ground Surface
- Formation Contact
- 1952 Surface Topography
- Estimated Potentiometric Surface in Unconsolidated Material June 15, 2020

Dissolved Groundwater Concentrations (ug/L)

pH
Beryllium (Be)
Cadmium (Cd)
Lithium (Li)
Nickel (Ni)

Concentrations are shown in red if they are at or above the GWPS of 4 ug/L Be, 5 ug/L Cd, 40 ug/L Li, and 100 ug/L Ni. pH values are shown in red if value is at or below 5.5

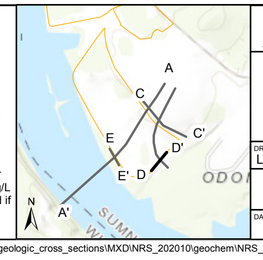

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Figure 4-6

GEOCHEMICAL CROSS SECTION D-D'
NRS

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
L.GREENE	M. FRIEDMAN	M. STAUFFER	REV. 1

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE: 12/7/2020

DEPT: FOSSIL AND HYDRO ENGINEERING

Document Path: M:\EnvDataViz\TVA\11.0 GIS\geologic_cross_sections\MXD\NRS_202010\geochem\NRS_DD_geochem.mxd

E

E'

NRS002

NRS006

26

S3

GAF-526U (NRS068)

NRS004

19R

NRS007

GAF-526L

NRS005

NRS001

Elevation (feet MSL)

490
480
470
460
450
440
430
420
410
400
390
380
370

0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400

Distance (feet)

pH 6.1

pH 6.4

pH 6.4

pH 5.7

pH 6.2

pH 7.1

pH 3.54
Be 13.3
Cd 4.65
Li 146
Ni 191

pH 4.3/4.0

pH 5.3

pH 3.8
Be 5.3
Cd 8.41
Li 31.3
Ni 140

pH 5.5

Refusal at 55.6'

Refusal at 55.7'

Refusal at 59.6'

pH: 6.8
Be <0.18
Cd <0.22
Li <11
Ni 3.03

Refusal at 64.2'

Refusal at 61.7'

Refusal at 60.3'

pH 7.2
Be 0.43 J
Cd <0.22
Li 5.0 J
Ni 5.1 J

Refusal at 103'

Terminated at 95'

Terminated at 210'
Screened 152-162' ft bgs

pH 7.3
Be <0.06
Cd <0.13
Li 191
Ni <0.31

Notes:
1. Lithology and top of rock interpretations at boring locations are based on boring logs and borehole geophysical data. Top of rock interpretations between borings are based on outcrops and topography.
2. Ground surface elevations derived from the 2017 LIDAR and 2016 River Bathymetry surveys.
3. NRS001-NRS007 soil and groundwater analysis is from 2015. NRS068 soil analysis is from March 2020. Well groundwater analyses is from January 2020, except GAF-526U (April 2020) and GAF-526L (January 2019).
4. Borings and wells are projected onto the cross section.
5. GWPS = groundwater protection standards
6. Filtered (dissolved) analytical results are presented on this figure for beryllium (Be), cadmium (Cd), lithium (Li) and nickel (Ni).

LEGEND

- Unconsolidated Material - Disturbed Native Alluvium, Fill and Mixture of Alluvium/Fill
- Unconsolidated Material - Fine-Grained Alluvium Typically Silty Clay with Varying Content of Sand and Gravel, Residuum
- CCR
- Lower Carters Limestone
- Lebanon Limestone

- Well Screen

Well or Soil Boring Lithology

- CCR
- Unconsolidated Sand and Less Frequently, Gravel; Typically Very Silty and/or Clayey Unconsolidated Fines, Predominantly Silt and/or Clay
- Lebanon Limestone

Soil Acid Base Accounting Net Neutralization Potential (NNP) Results

- Potentially acid generating NNP < -20
- Uncertain acid generating potential -20 ≤ NNP ≤ +20
- Potentially acid neutralizing NNP > 20
- Estimated Phreatic Surface in CCR June 15, 2020

- pH ≤ 5
- 5 < pH < 6
- pH ≥ 6
- S Pyritic sulfur detected from 0.37-3.72%
- S Pyritic sulfur detected from 0.03-0.29%
- S Pyritic sulfur <0.03%

- Ground Surface
- Formation Contact
- 1952 Surface Topography
- Estimated Potentiometric Surface in Unconsolidated Material June 15, 2020

Dissolved Groundwater Concentrations (ug/L)

pH
Beryllium (Be)
Cadmium (Cd)
Lithium (Li)
Nickel (Ni)

Concentrations are shown in red if they are at or above the GWPS of 4 ug/L Be, 5 ug/L Cd, 40 ug/L Li, and 100 ug/L Ni. pH values are shown in red if value is at or below 5.5

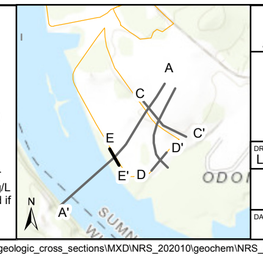

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Figure 4-7

GEOCHEMICAL CROSS SECTION E-E'
NRS

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
L.GREENE	M. FRIEDMAN	M. STAUFFER	REV. 1

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE:	DEPT:
12/7/2020	FOSSIL AND HYDRO ENGINEERING

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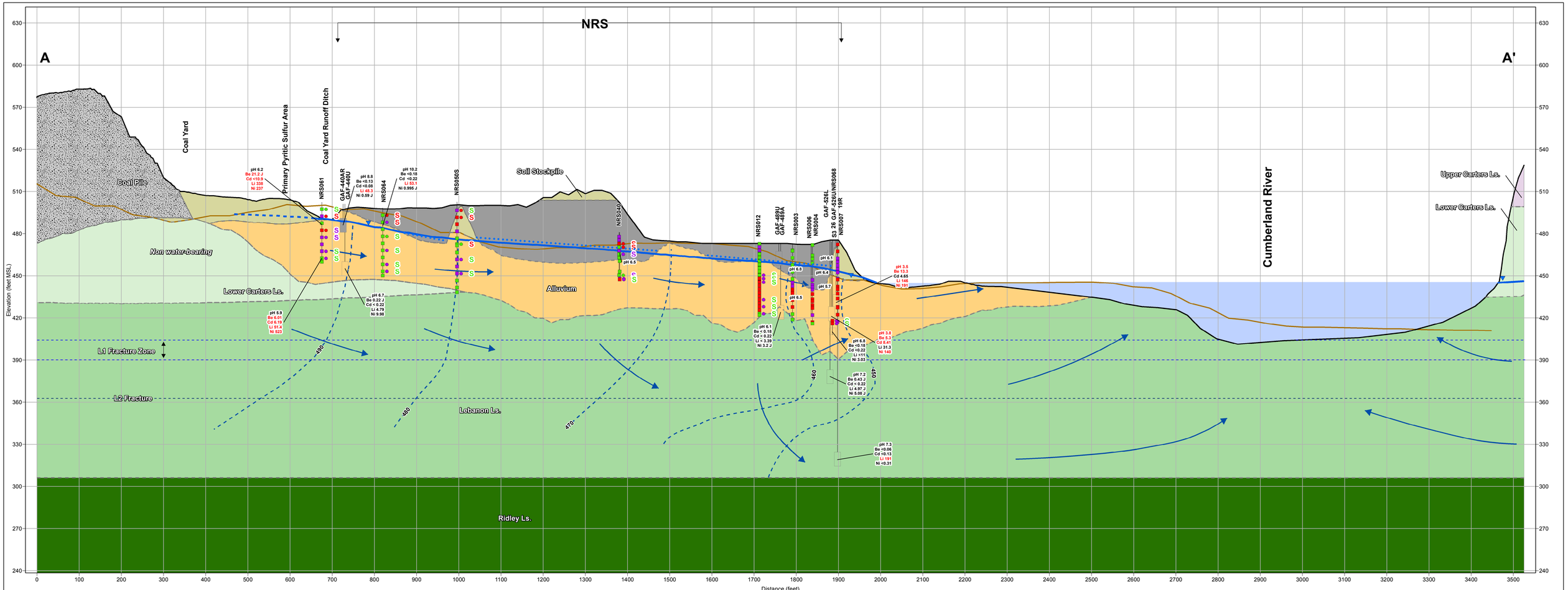

LEGEND

- Unconsolidated Material - Disturbed Native Alluvium, Fill and Mixture of Alluvium/Fill
- Unconsolidated Material – Fine-Grained Alluvium, Typically Silty Clay with Varying Content of Sand and Gravel, Residuum
- CCR
- Lower Carters Limestone
- Lebanon Limestone
- Coal Pile
- Well Screen
- Ground Surface
- Formation Contact
- 1952 Surface Topography
- Estimated Potentiometric Surface in Unconsolidated Material June 15, 2020; Dashed Where Inferred Due to Limited Data
- Estimated Phreatic Surface in CCR June 15, 2020
- Groundwater Flow Direction
- 470' Potentiometric Surface Contour (ft msl), June 15, 2020

Soil Acid Base Accounting Net Neutralization Potential (NNP) Results

- Potentially acid generating NNP < -20
- Uncertain acid generating potential -20 ≤ NNP ≤ +20
- Potentially acid neutralizing NNP > 20

- pH ≤ 5
- 5 < pH < 6
- pH ≥ 6
- S Pyritic sulfur detected from 0.37-3.72%
- S Pyritic sulfur detected from 0.03-0.29%
- S Pyritic sulfur <0.03%

Dissolved Groundwater Concentrations (ug/L)

pH
Beryllium (Be)
Cadmium (Cd)
Lithium (Li)
Nickel (Ni)

Concentrations are shown in red if they are at or above the GWPS of 4 ug/L Be, 5 ug/L Cd, 40 ug/L Li, and 100 ug/L Ni. pH values are shown in red if value is at or below 5.5

Notes:
1. Lithology and top of rock interpretations art boring locations are based on boring logs and borehole geophysical data. Top of rock interpretations between borings are based on outcrops and topography.
2. Ground surface elevations derived from the 2017 LIDAR and 2016 River Bathymetry surveys.
3.Soil and in-situ groundwater analyses are from 2015 (NRS001 to NRS006) and 2020 (NRS061 to NRS070).
4. Well groundwater analyses from January 2020, except GAF-526U (April 2020), GAF-526L (January 2019) and GAF-440AR (January 2017).
5. Borings and wells are projected onto the cross section.
6. GWPS = groundwater protection standards
7. Filtered (dissolved) analytical results are presented on this figure for beryllium (Be), cadmium (Cd), lithium (Li) and nickel (Ni).
8. June 15, 2020 potentiometric contours and flow lines shown.
9. The primary pyritic sulfur area is the area of the NRS where pyritic sulfur exists at some of the highest mass fractions (up to 3.02%), in both the unsaturated and saturated zones, and to the greatest depth (25 ft bgs).

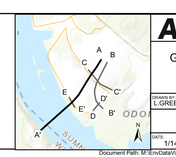

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Figure 4-8

GEOCHEMICAL CROSS SECTION A-A'
NRS

DRAWN BY	REVIEWED BY	APPROVED BY	REVISION NUMBER
L.GREENE	M. FRIEDMAN	M. STAUFFER	REV. 1

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE	GROUP
1/14/2021	FOSSIL AND HYDRO ENGINEERING

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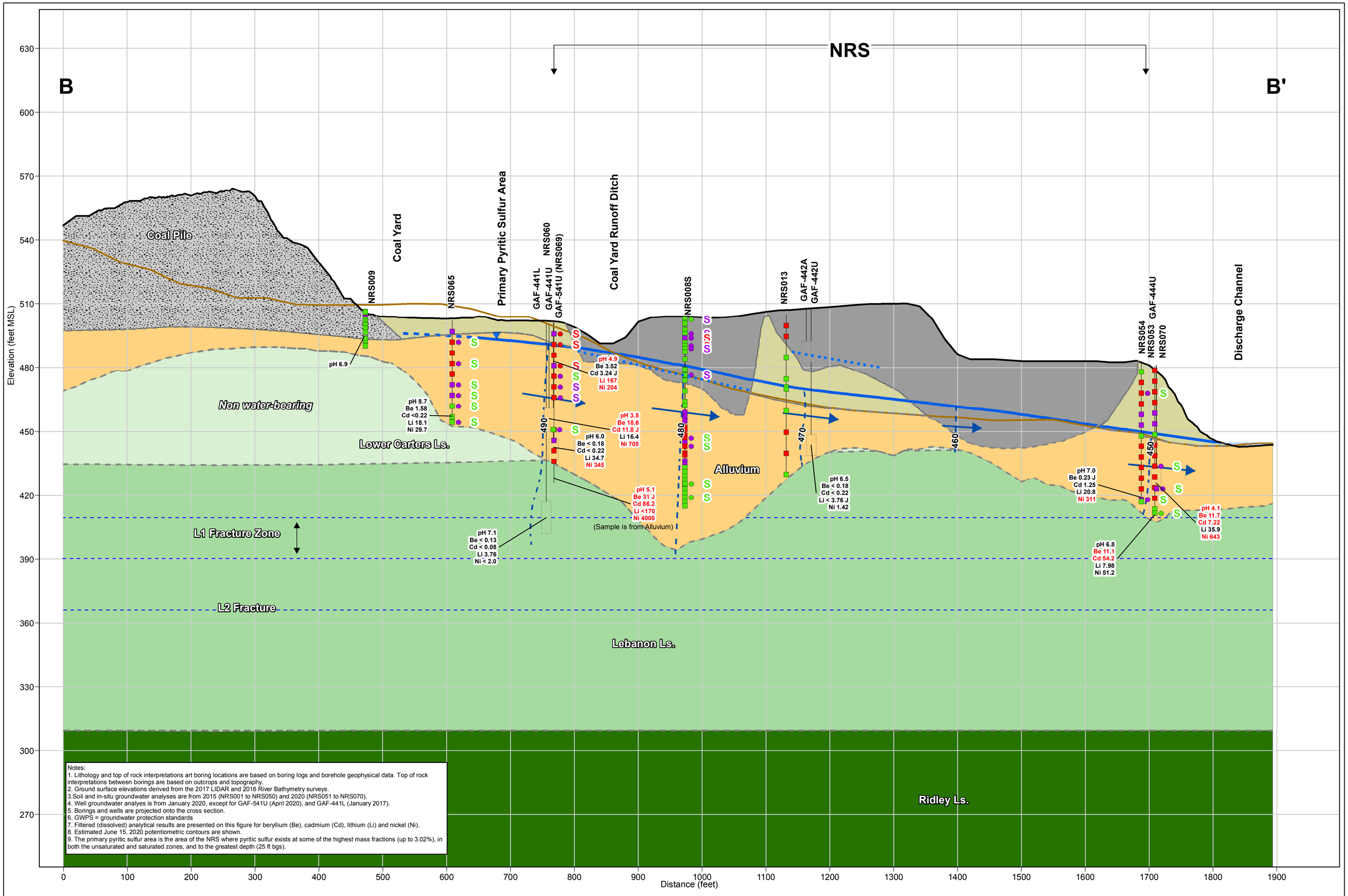


Notes:
1. Lithology and top of rock interpretations art boring locations are based on boring logs and borehole geophysical data. Top of rock interpretations between borings are based on outcrops and topography.
2. Ground surface elevations derived from the 2017 LIDAR and 2016 River Bathymetry surveys.
3.Soil and in-situ groundwater analyses are from 2015 (NRS001 to NRS050) and 2020 (NRS051 to NRS070).
4. Well groundwater analyes is from January 2020, except for GAF-541U (April 2020), and GAF-441L (January 2017).
5. Borings and wells are projected onto the cross section.
6. GWPS = groundwater protection standards
7. Filtered (dissolved) analytical results are presented on this figure for beryllium (Be), cadmium (Cd), lithium (Li) and nickel (Ni).
8. Estimated June 15, 2020 potentiometric contours are shown.
9. The primary pyritic sulfur area is the area of the NRS where pyritic sulfur exists at some of the highest mass fractions (up to 3.02%), in both the unsaturated and saturated zones, and to the greatest depth (25 ft bgs).

LEGEND

- Unconsolidated Material - Disturbed Native Alluvium, Fill and Mixture of Alluvium/Fill
- Unconsolidated Material – Fine-Grained Alluvium, Typically Silty Clay with Varying Content of Sand and Gravel, Residuum
- CCR
- Lower Carters Limestone
- Lebanon Limestone
- Coal Pile
- Well Screen
- Ground Surface
- Formation Contact
- 1952 Surface Topography
- Estimated Potentiometric Surface in Unconsolidated Material June 15, 2020; Dashed Where Inferred Due to Limited Data
- Estimated Phreatic Surface in CCR June 15, 2020

Soil Acid Base Accounting Net Neutralization Potential (NNP) Results

- Potentially acid generating NNP < -20
- Uncertain acid generating potential -20 ≤ NNP ≤ +20
- Potentially acid neutralizing NNP > 20

- pH ≤ 5
- 5 < pH < 6
- pH ≥ 6

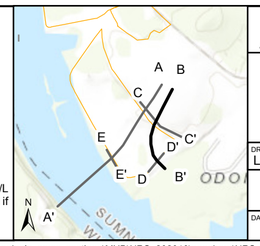
- S — Pyritic sulfur detected from 0.37-3.72%
- S — Pyritic sulfur detected from 0.03-0.29%
- S — Pyritic sulfur <0.03%

- Groundwater Flow Direction
- 470' — Potentiometric Surface Contour (ft msl), June 15, 2020

Dissolved Groundwater Concentrations (ug/L)

pH
Beryllium (Be)
Cadmium (Cd)
Lithium (Li)
Nickel (Ni)

Concentrations are shown in red if they are at or above the GWPS of 4 ug/L Be, 5 ug/L Cd, 40 ug/L Li, and 100 ug/L Ni. pH values are shown in red if value is at or below 5.5



AECOM

Figure 4-9

GEOCHEMICAL CROSS SECTION B-B'
NRS

DRAWN BY:	REVIEWED BY:	APPROVED BY:	REVISION NUMBER:
L.GREENE	M. FRIEDMAN	M. STAUFFER	REV. 1

GALLATIN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

DATE: 1/14/2021 DEPT: FOSSIL AND HYDRO ENGINEERING

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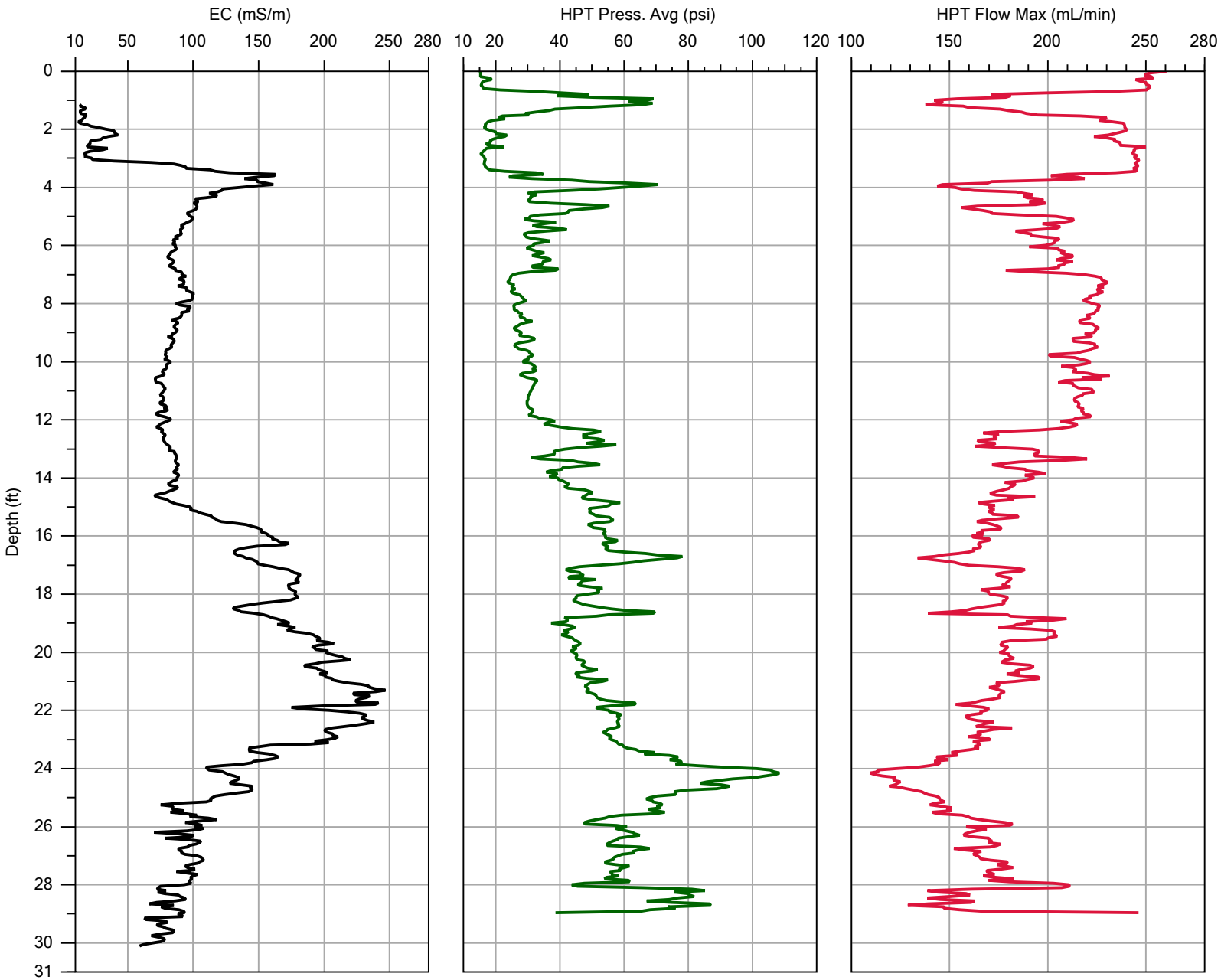
Appendix A – Hydraulic Profiling Tool Profiles

Table of Contents

1. NRS 2020 Field Investigation HPT Profiles

2. NRS 2015 Field Investigation HPT Profiles

NRS 2020 Field Investigation HPT Profiles



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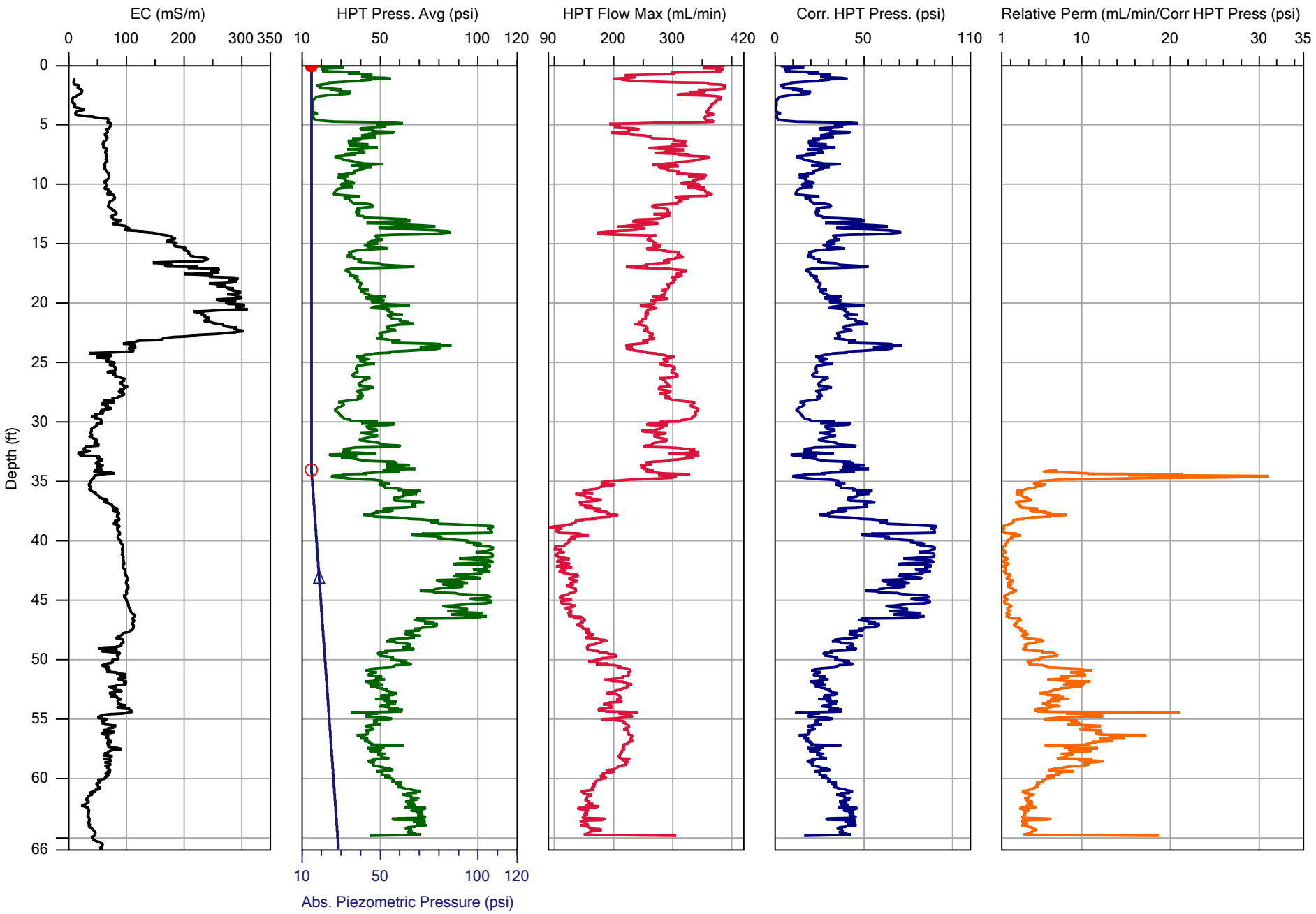
Project ID: 60621225	Client: TVA	Location: Gallatin, TN



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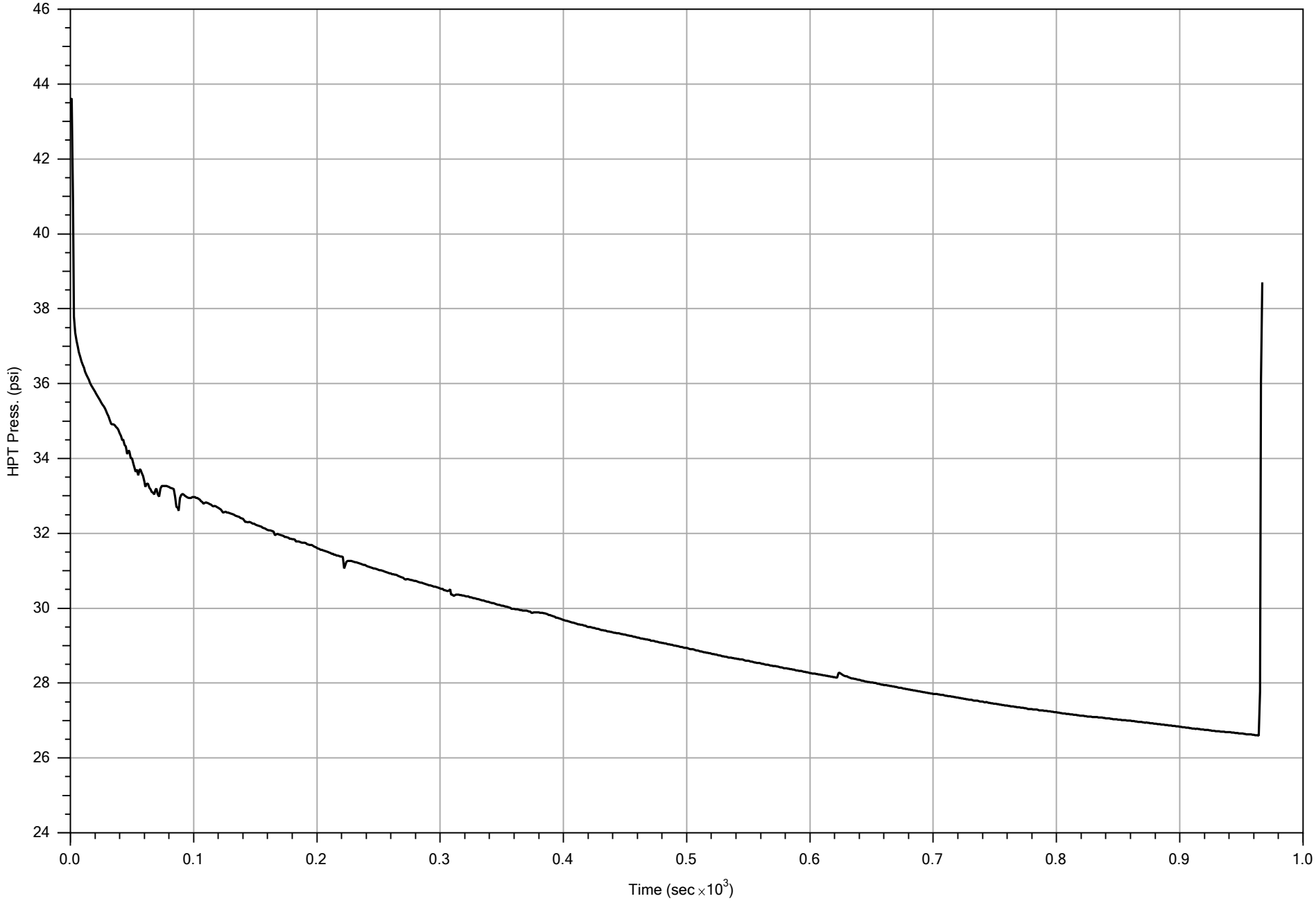

AECOM

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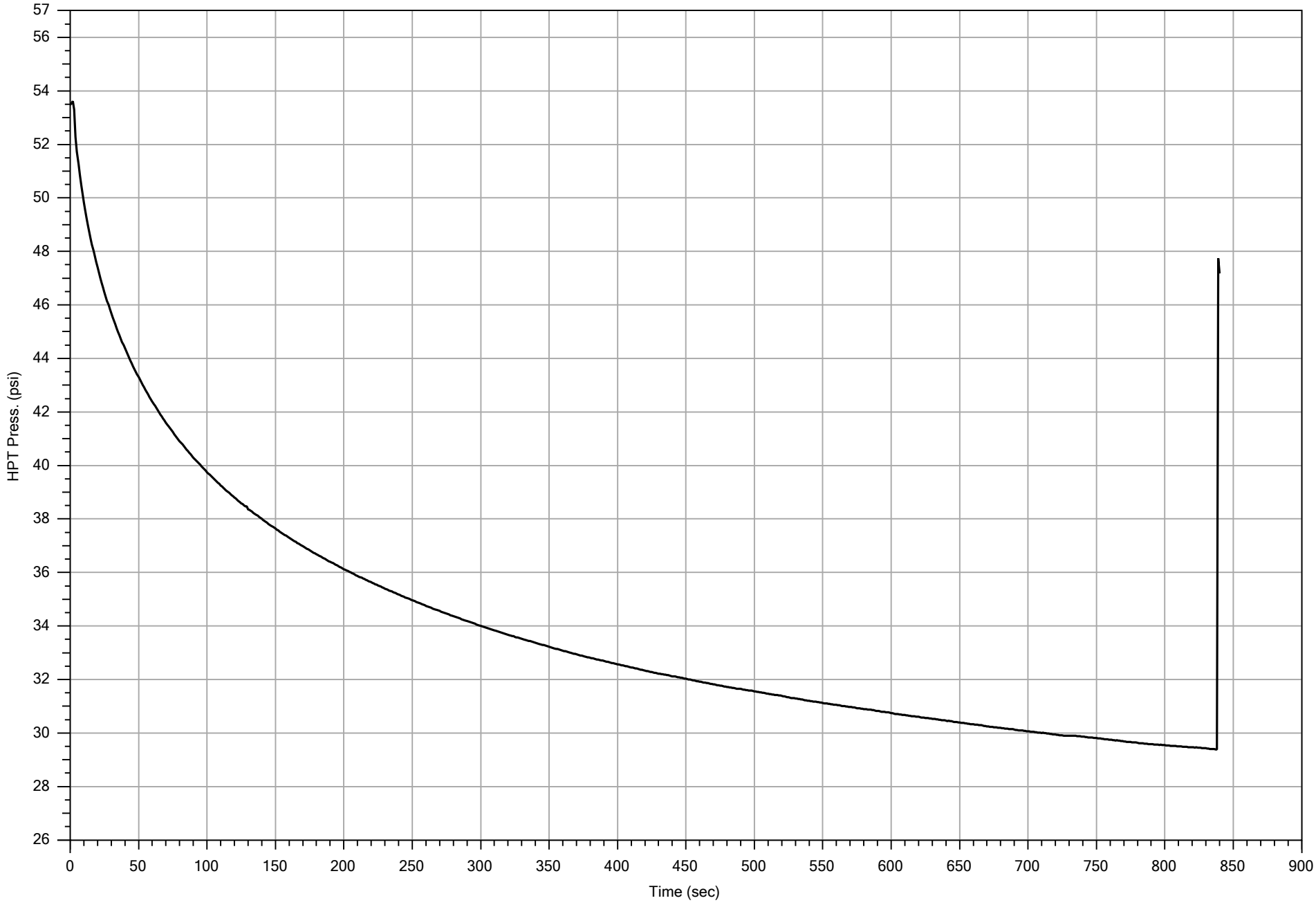

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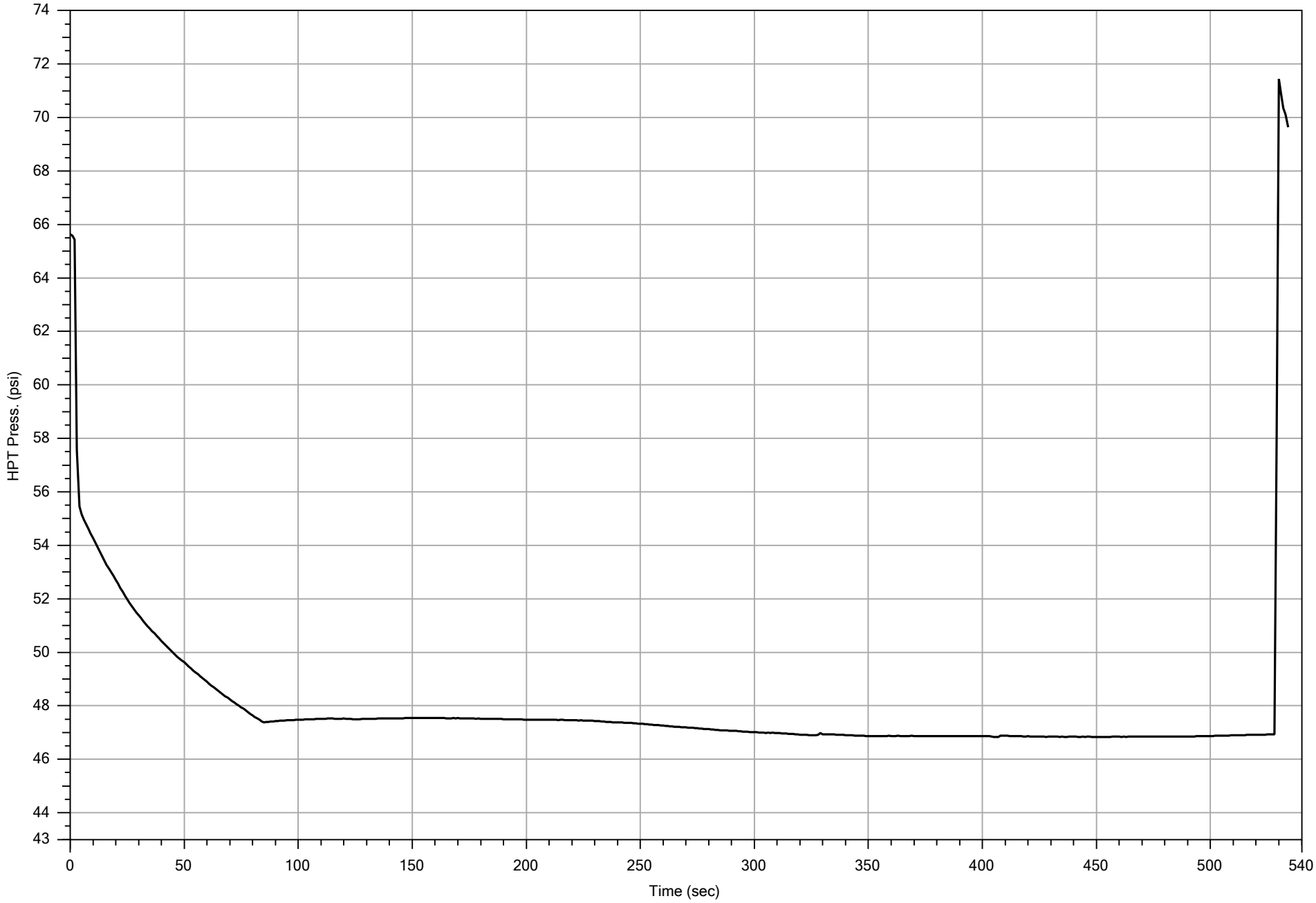

AECOM

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Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	Location:	Sensor: HPT Press.
Project ID: 60621225	Client: TVA	Depth: 64.80 ft	Test: 1

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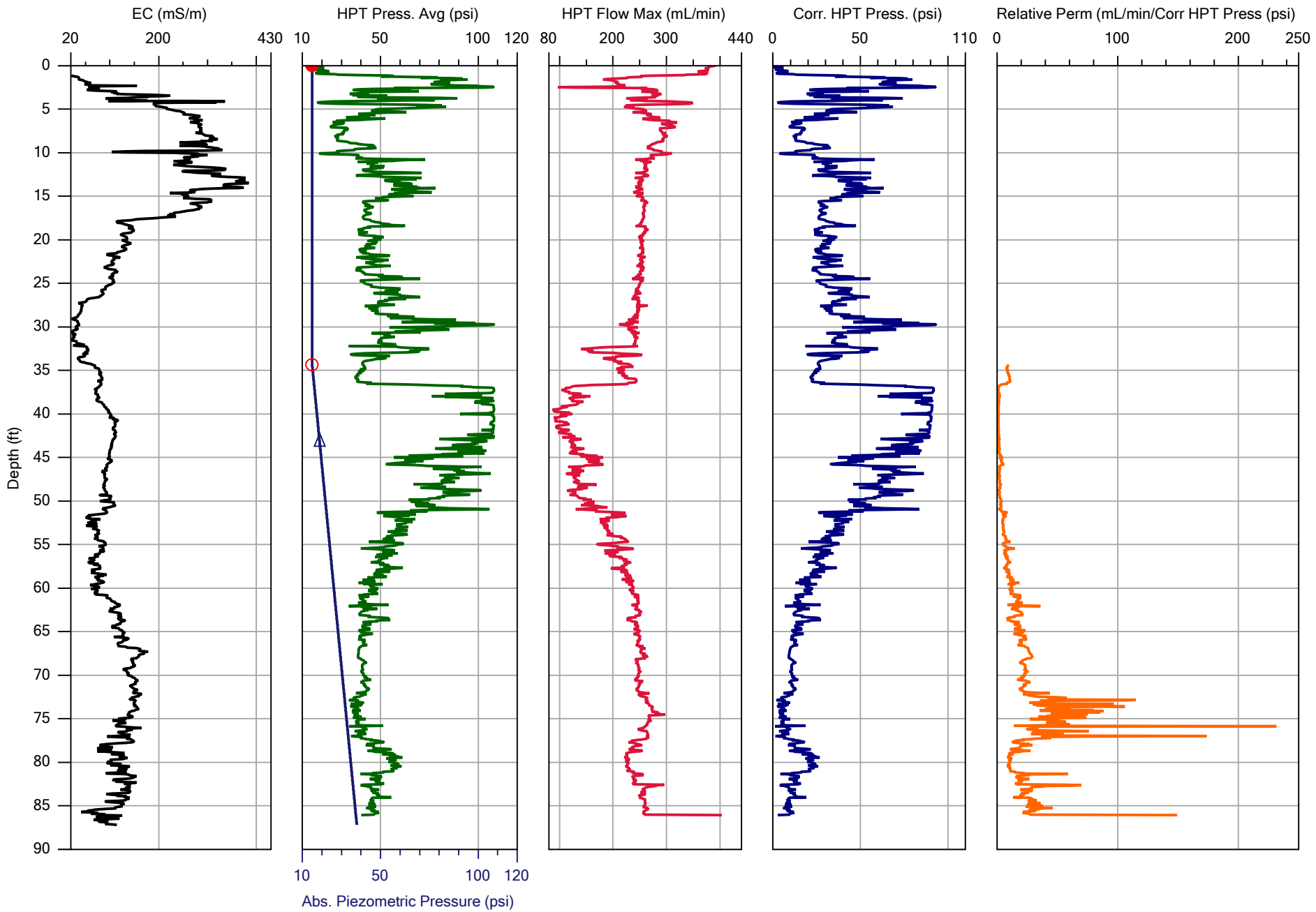

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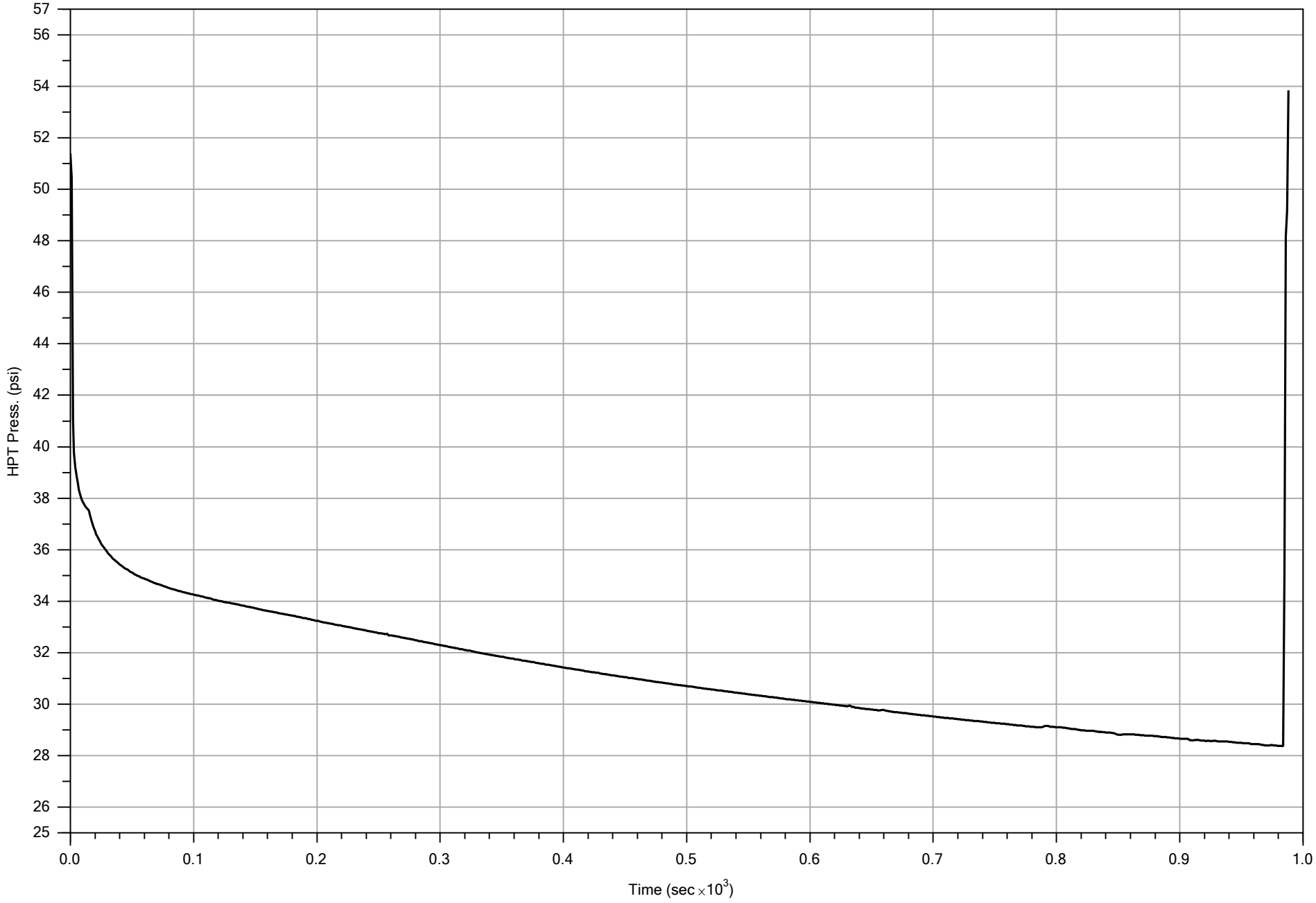

AECOM

HPT DISSIPATION (SINGLE CASE)

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	Location:	Sensor: HPT Press.
Project ID: 60621225	Client: TVA	Depth: 32.25 ft	Test: 1

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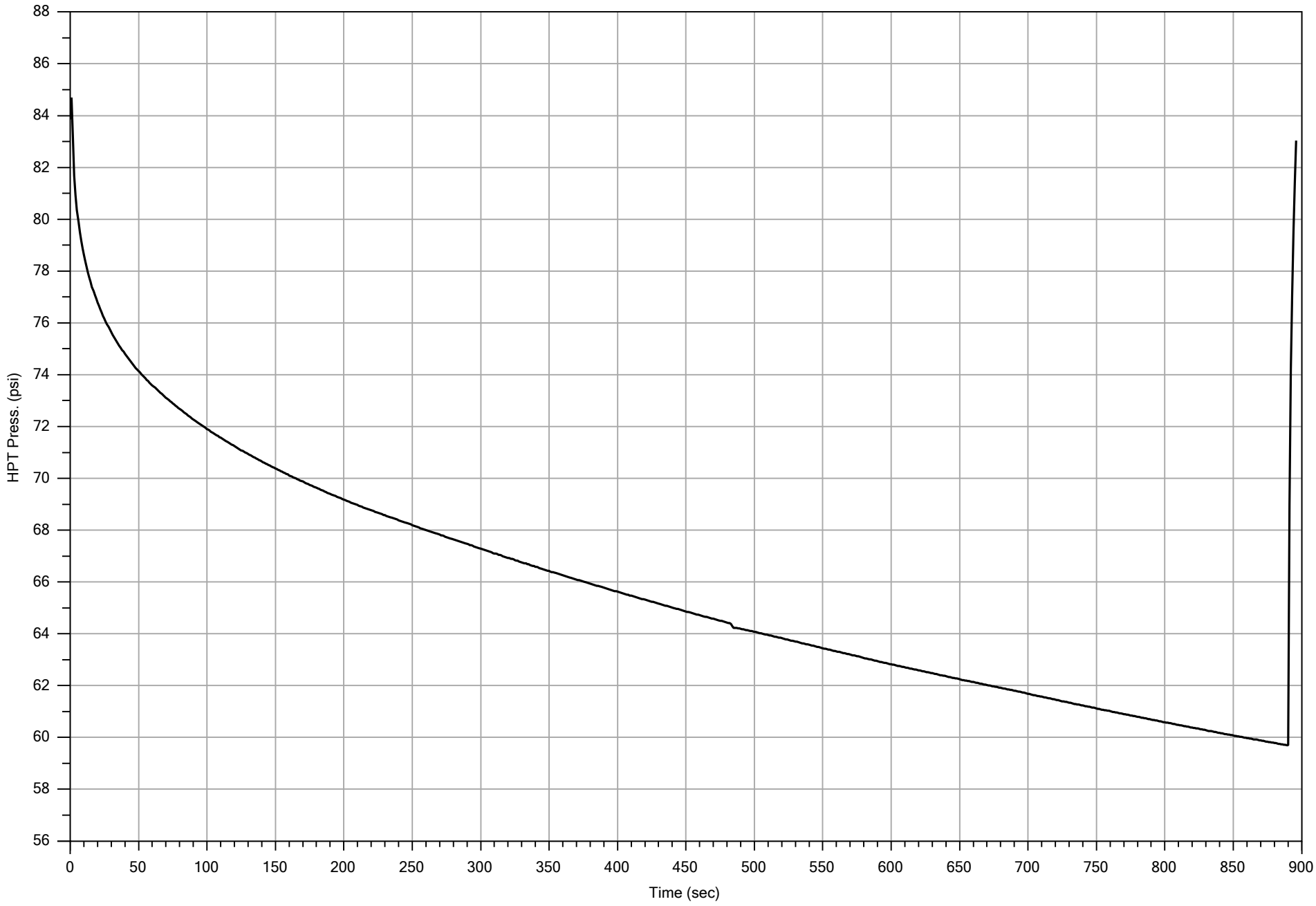

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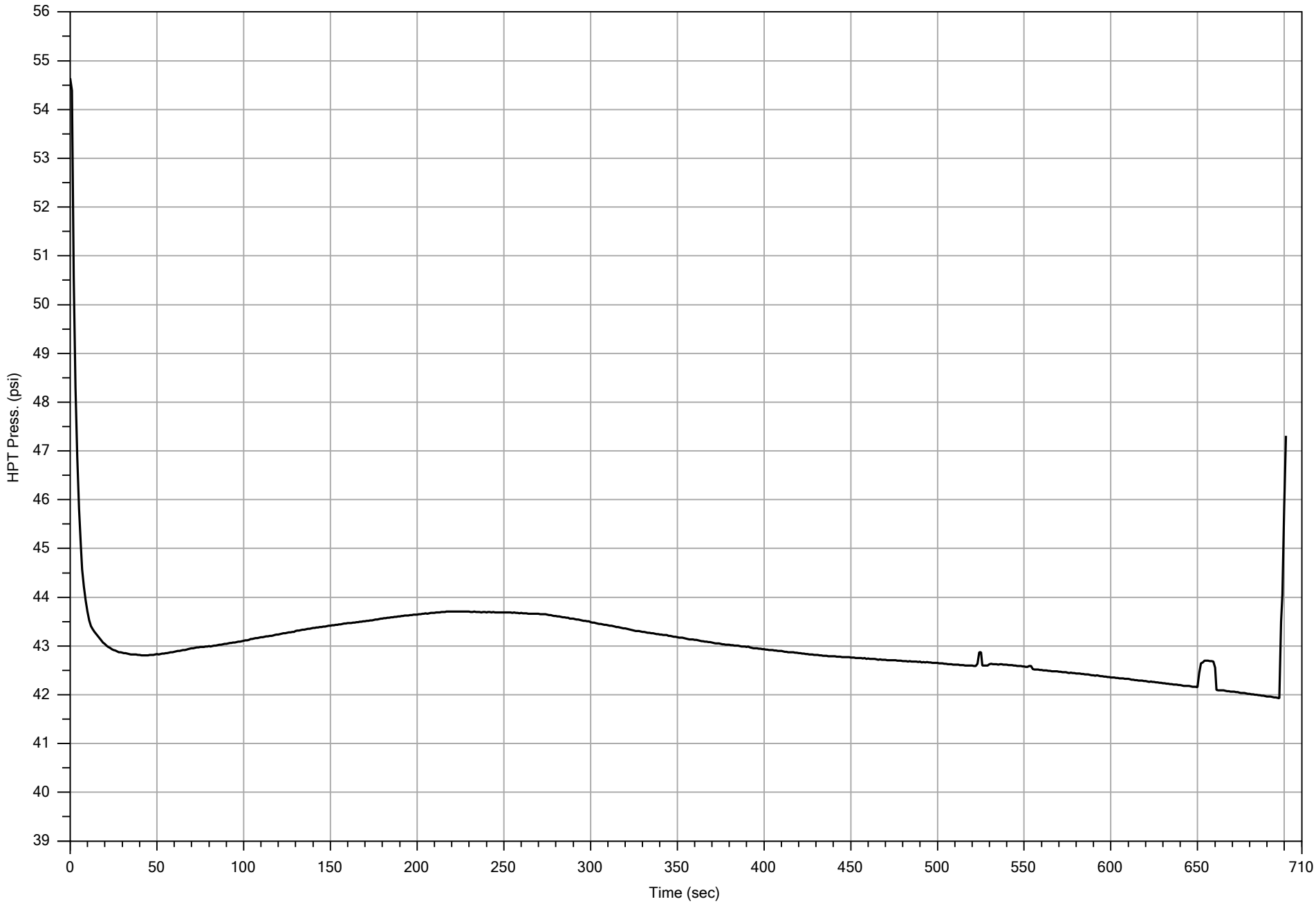

AECOM

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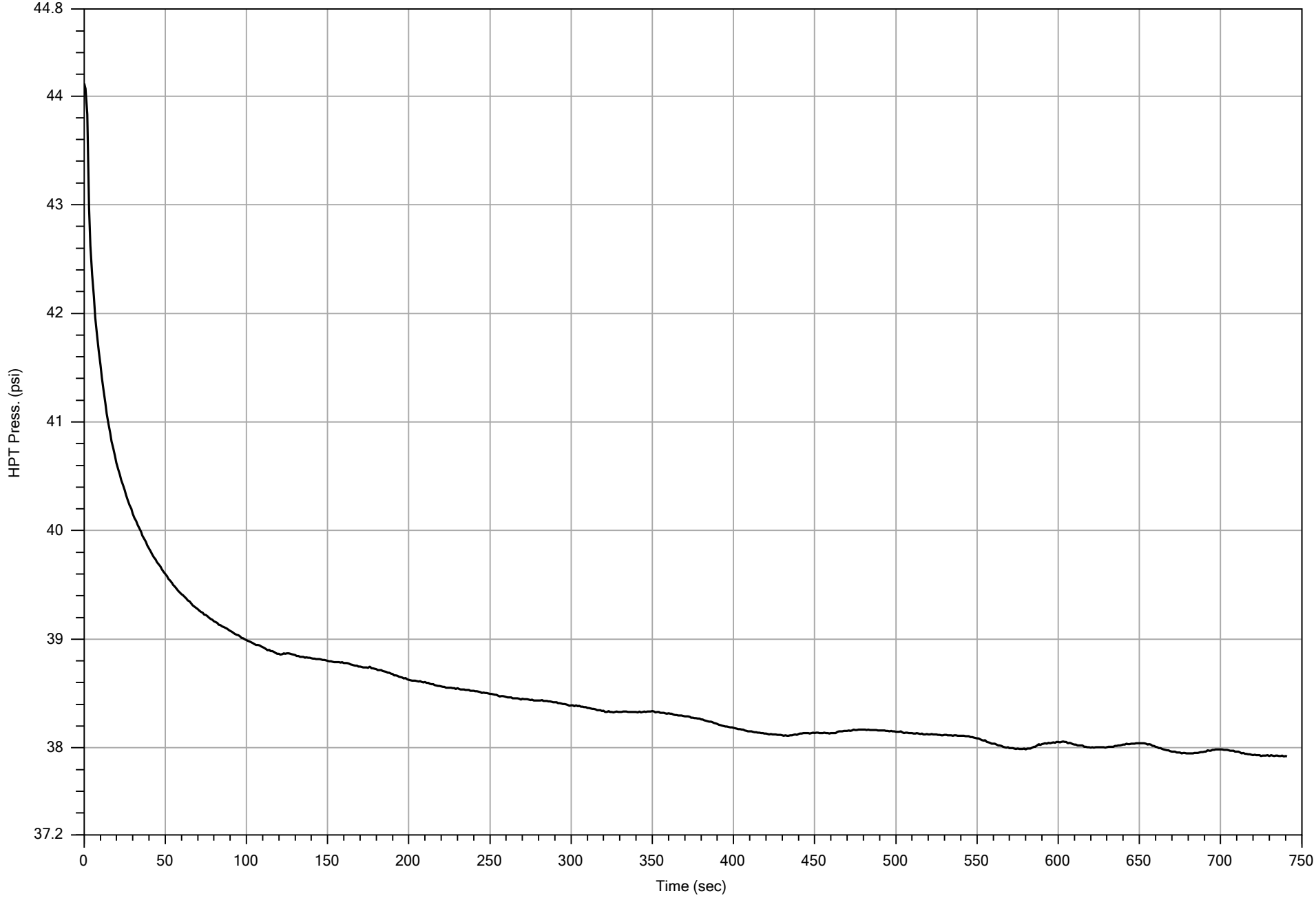

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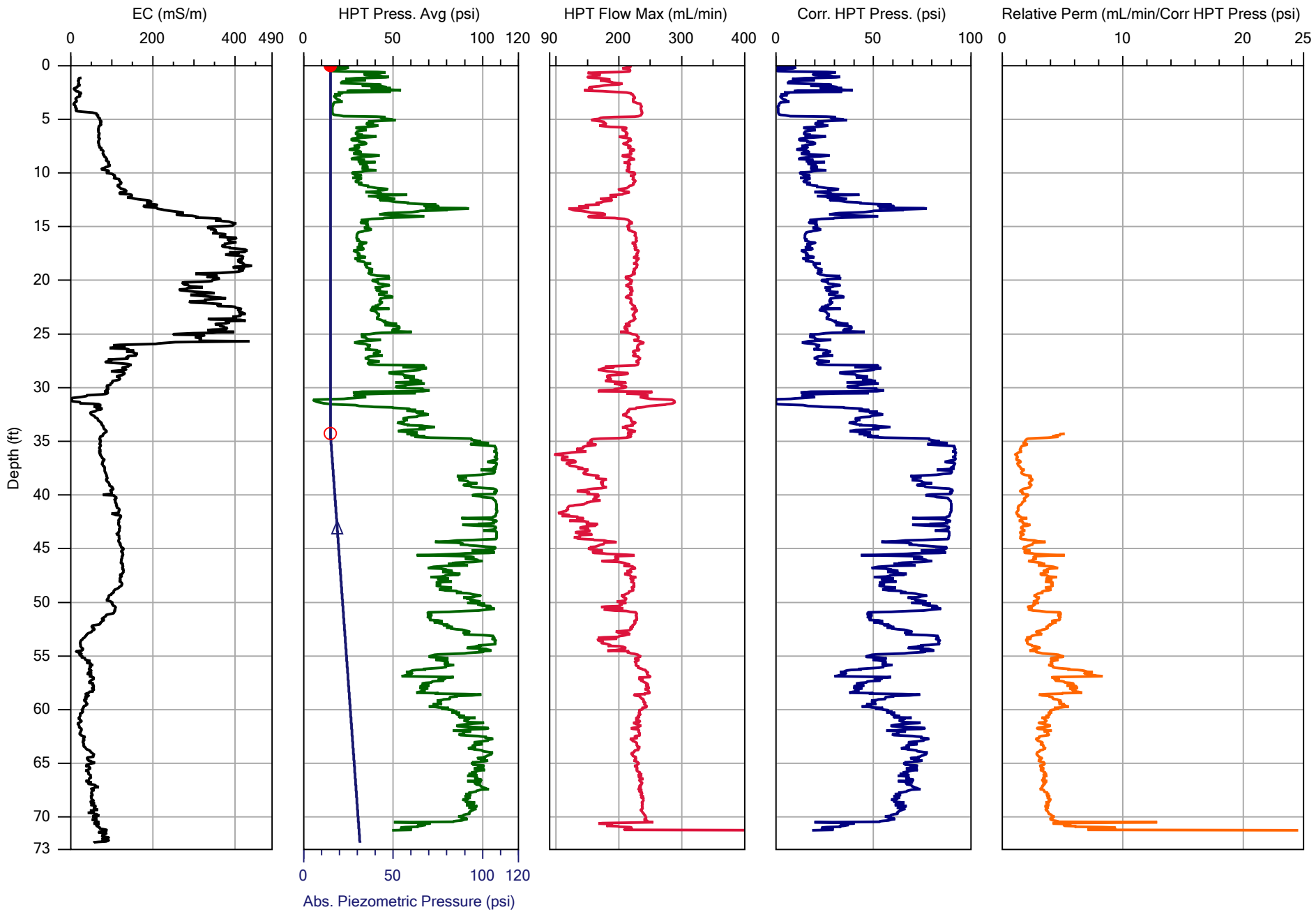

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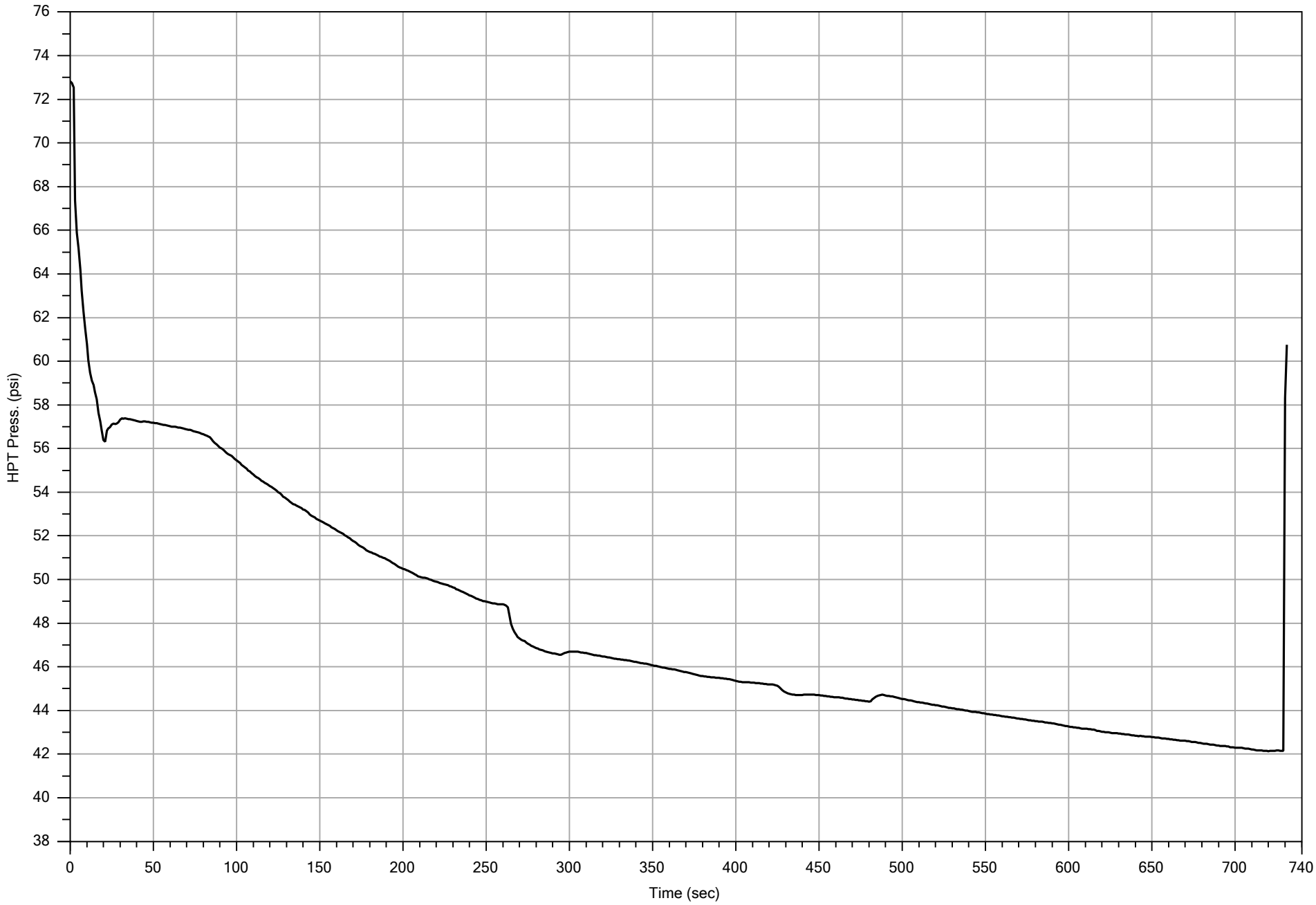

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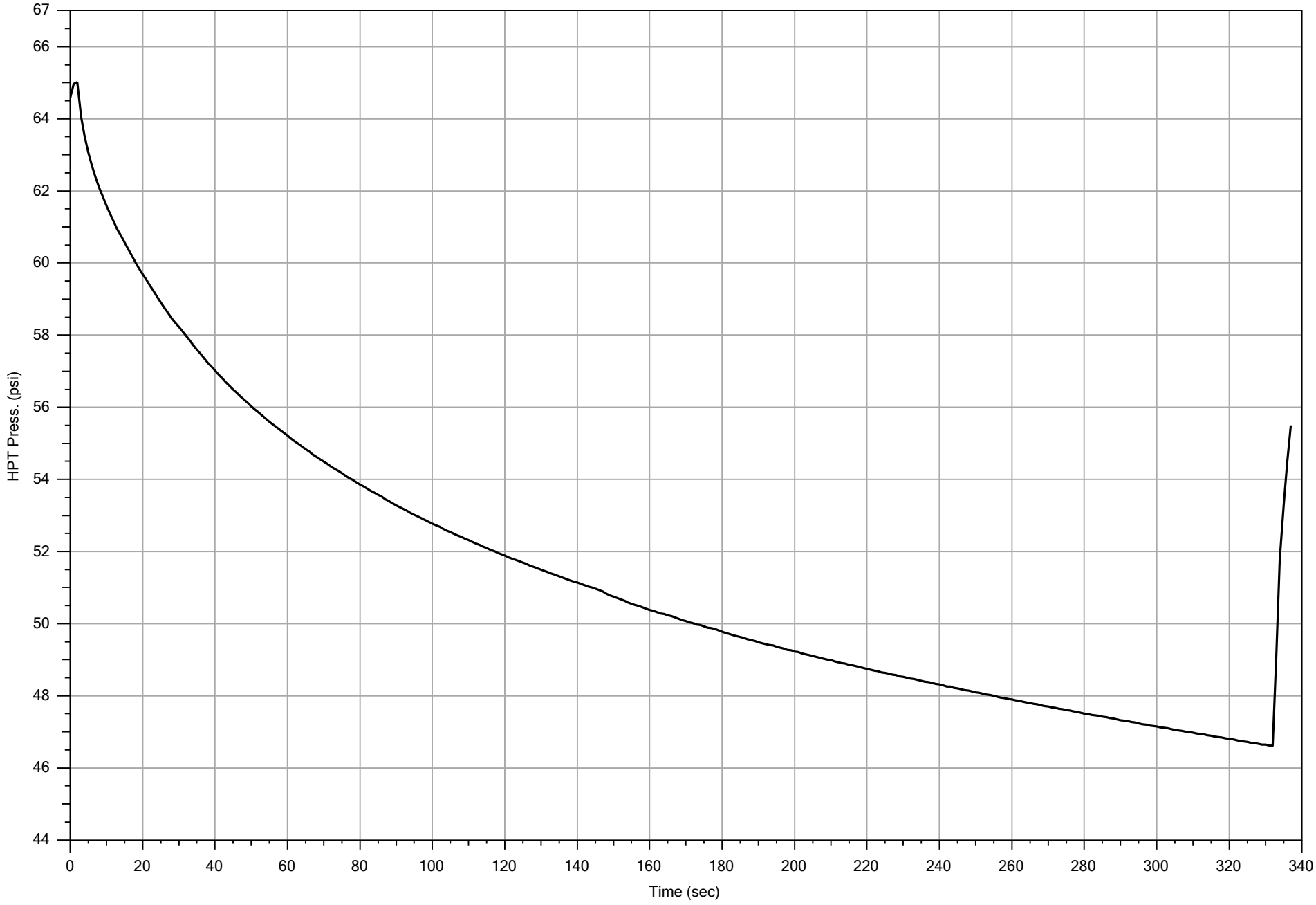

AECOM

HPT DISSIPATION (SINGLE CASE)

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	File: NRS054.TIM	Date: 1/23/2020
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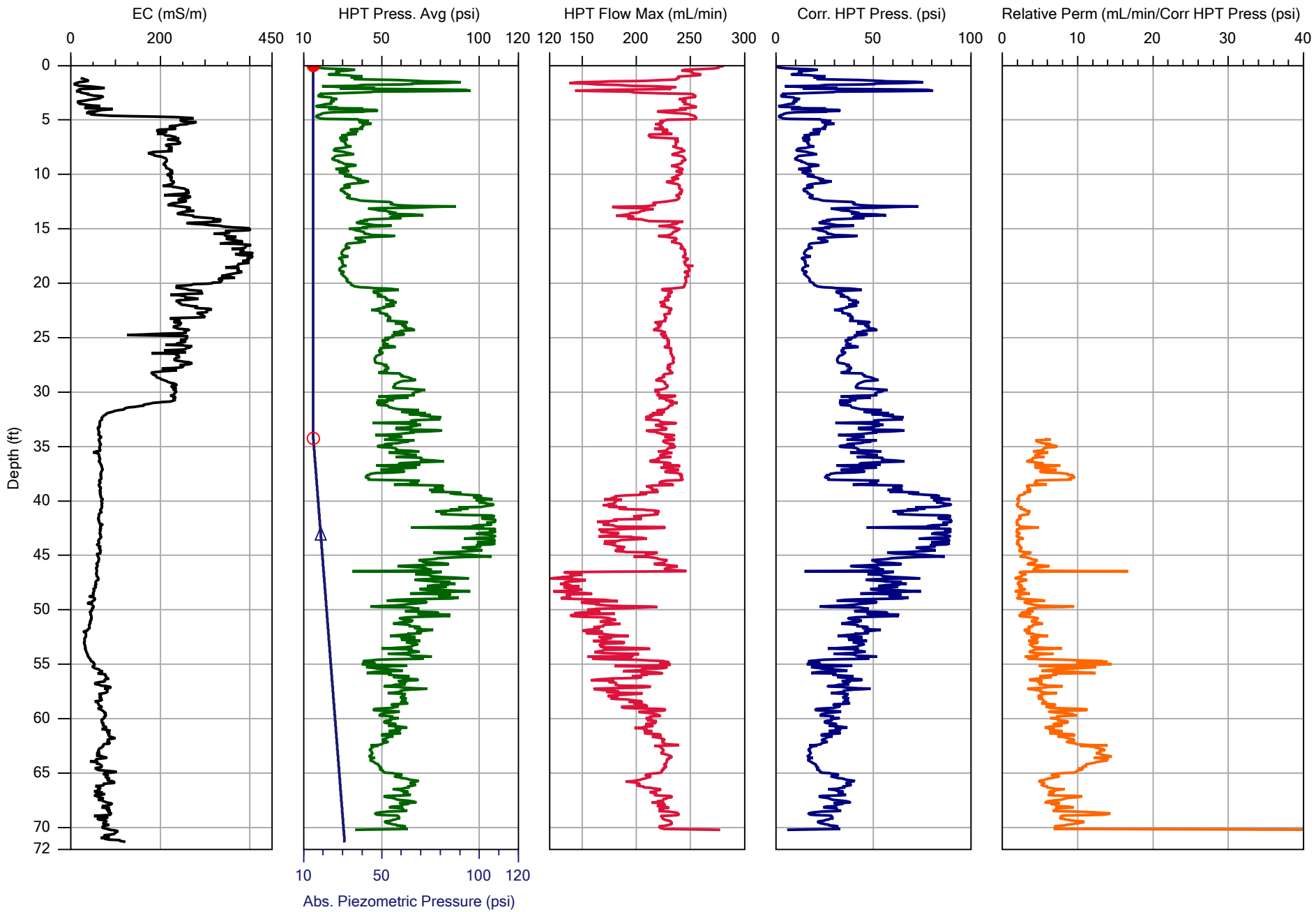

AECOM

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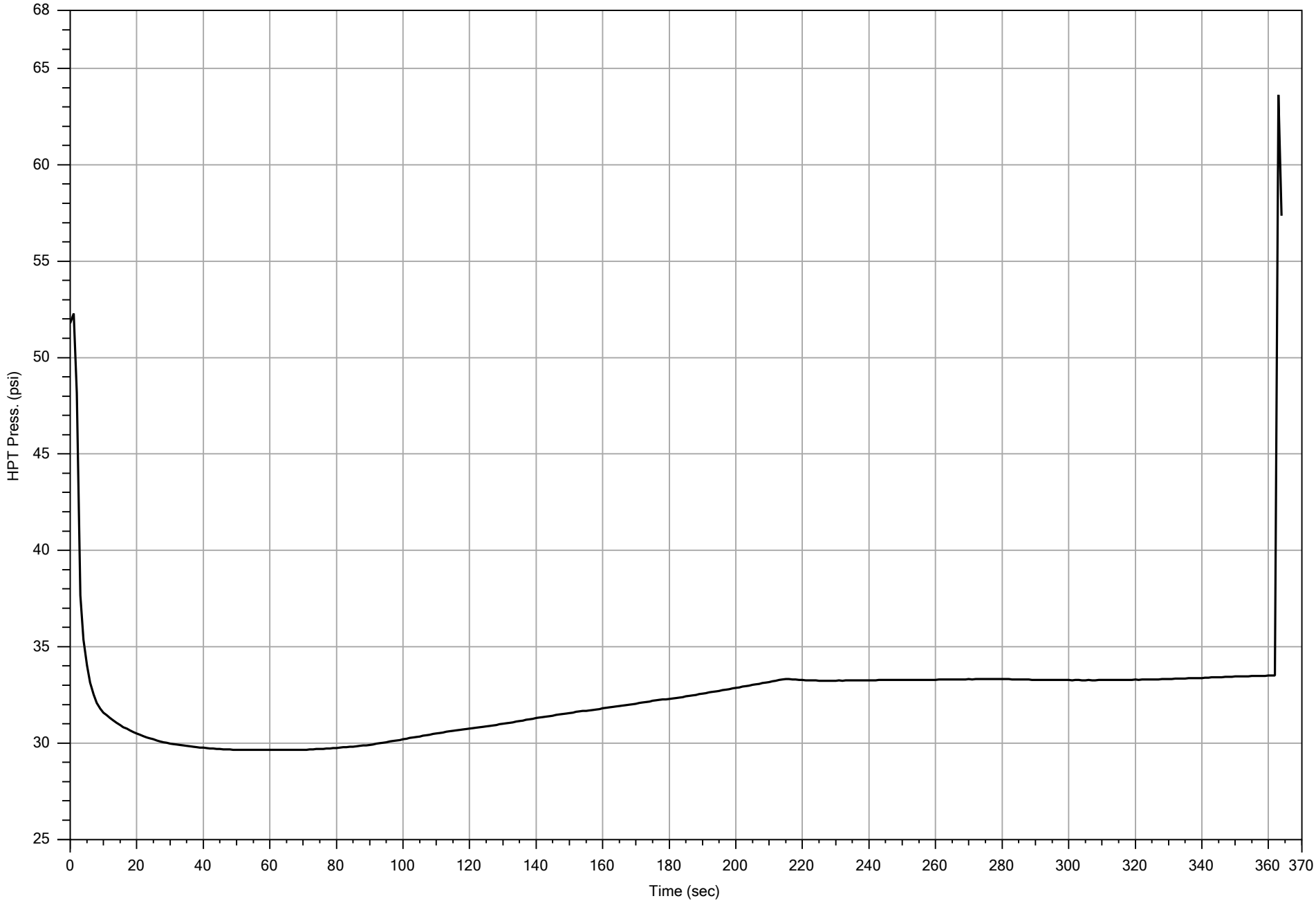

AECOM

HPT DISSIPATION (SINGLE CASE)

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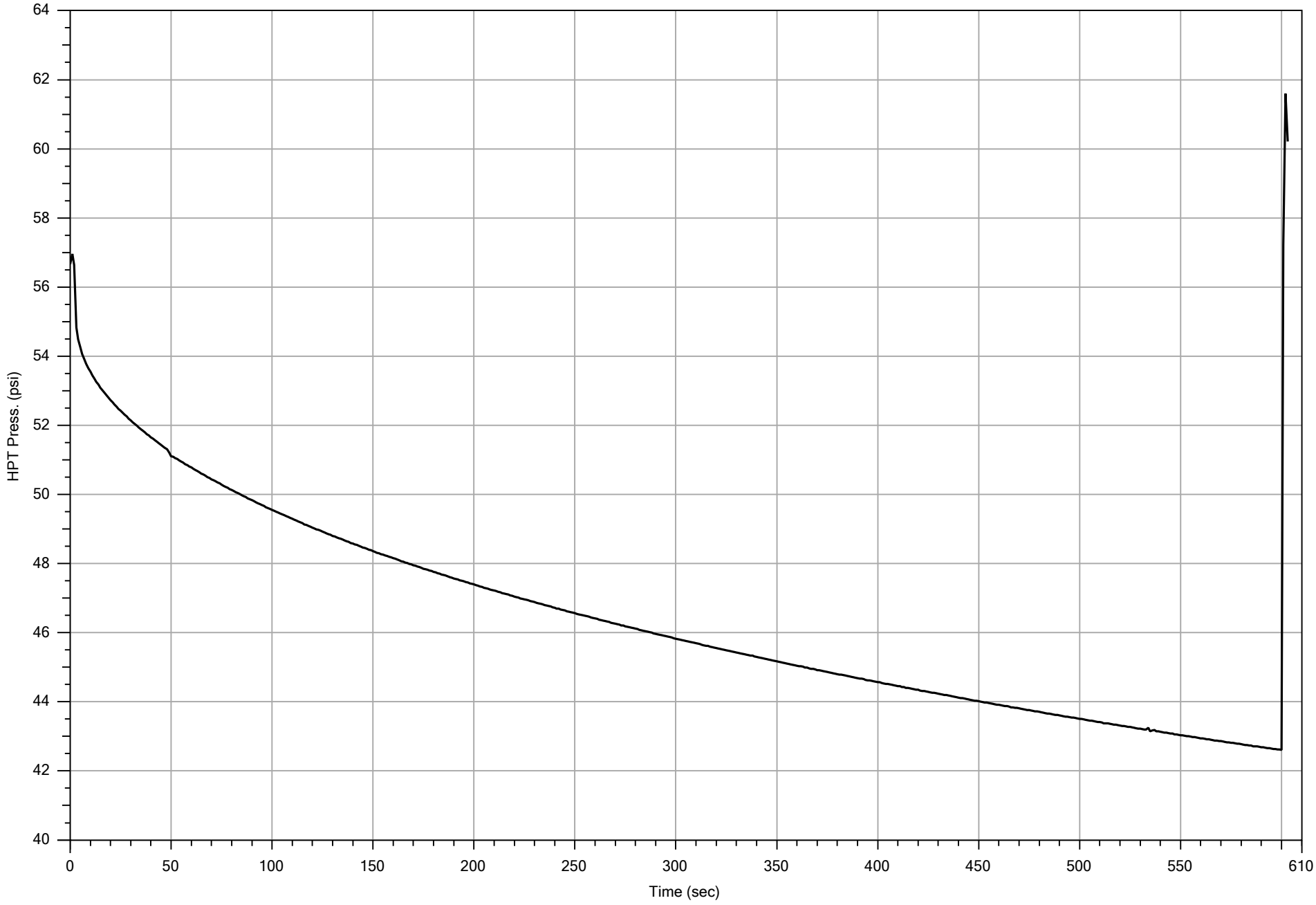

AECOM

HPT DISSIPATION (SINGLE CASE)

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	Location:	Sensor: HPT Press.
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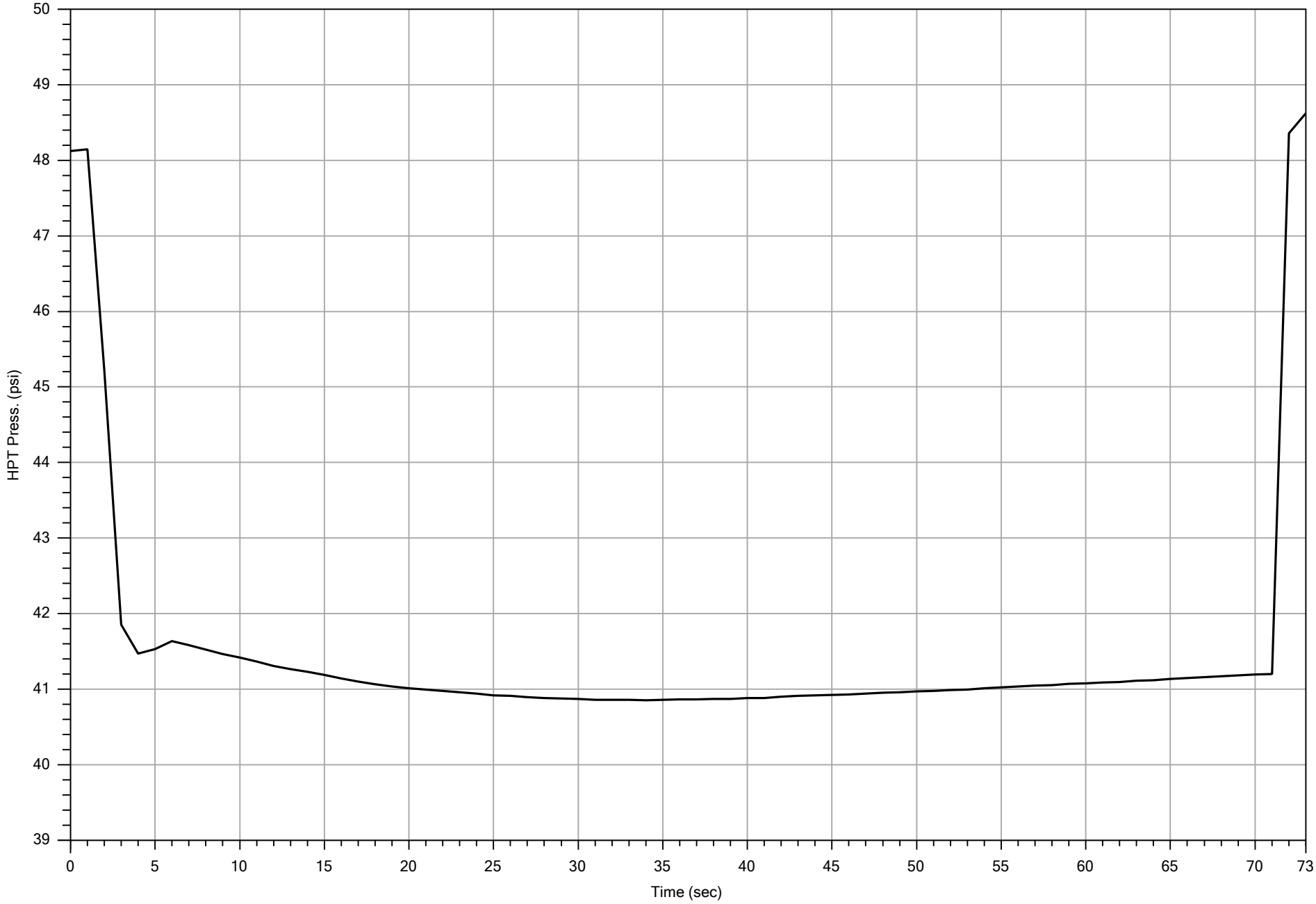
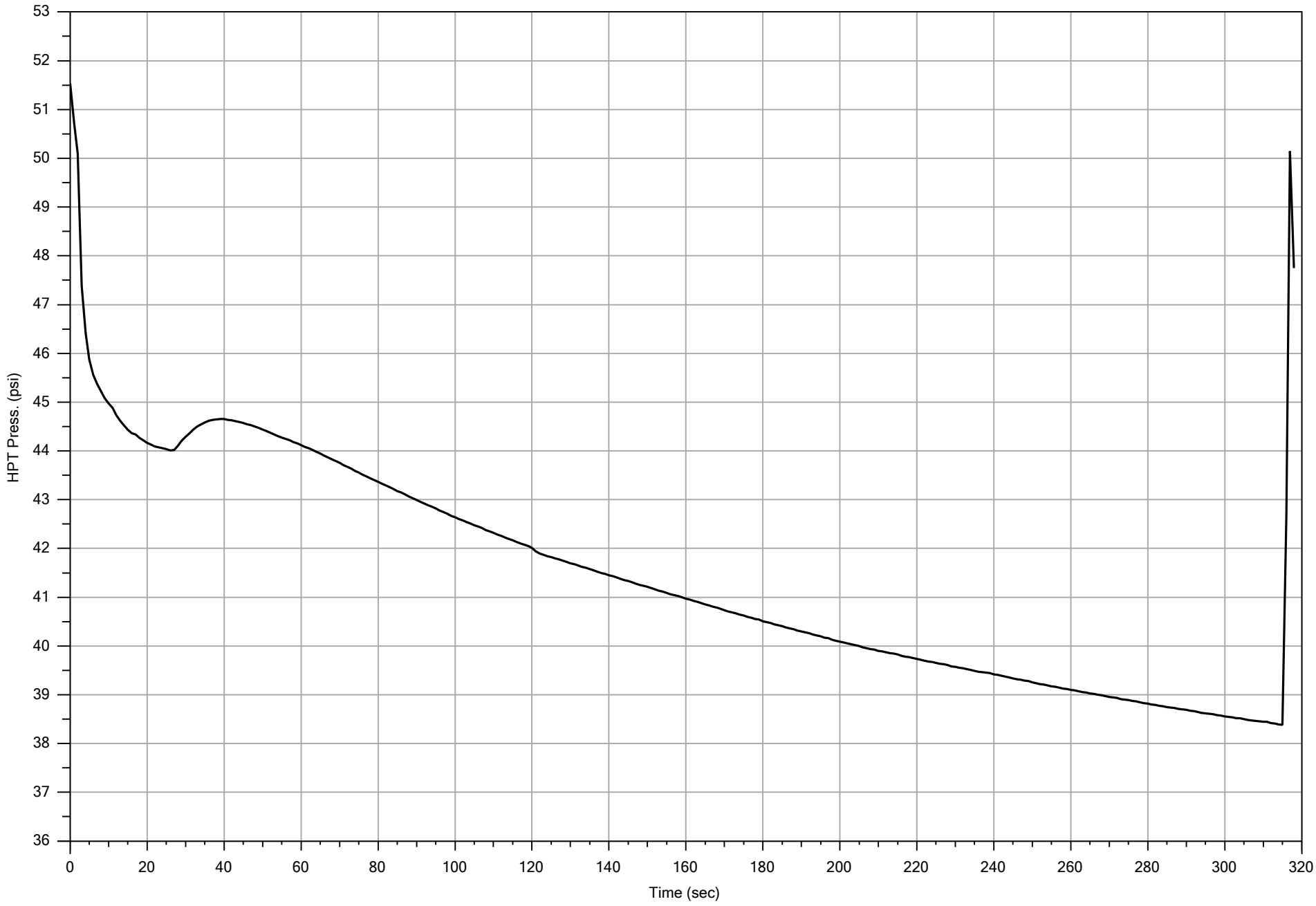


AECOM

HPT DISSIPATION (SINGLE CASE)

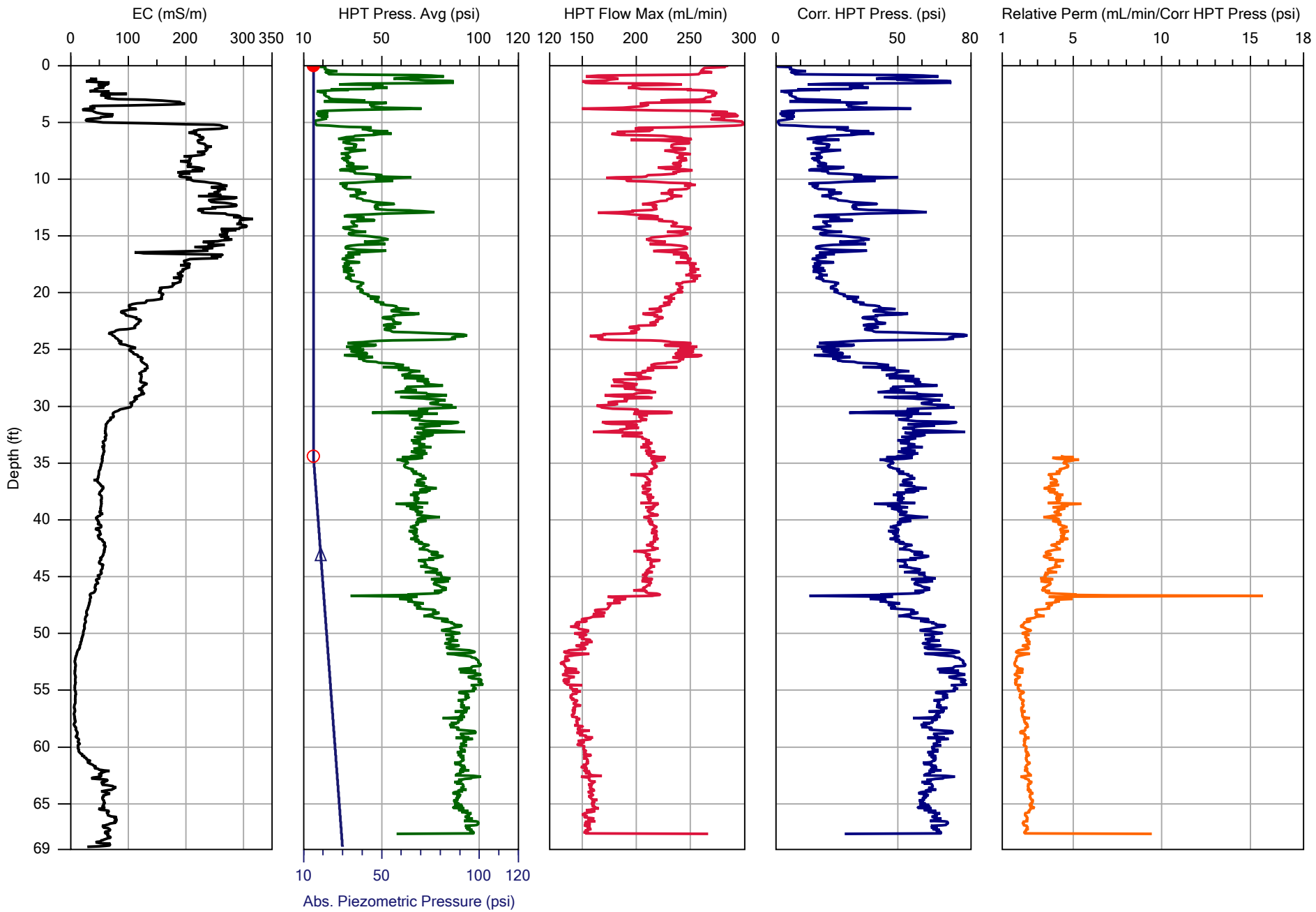
		File: NRS055.TIM	Date: 1/23/2020
Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	Location:	Sensor: HPT Press.
Project ID: 60621225	Client: TVA	Depth: 62.45 ft	Test: 1



AECOM

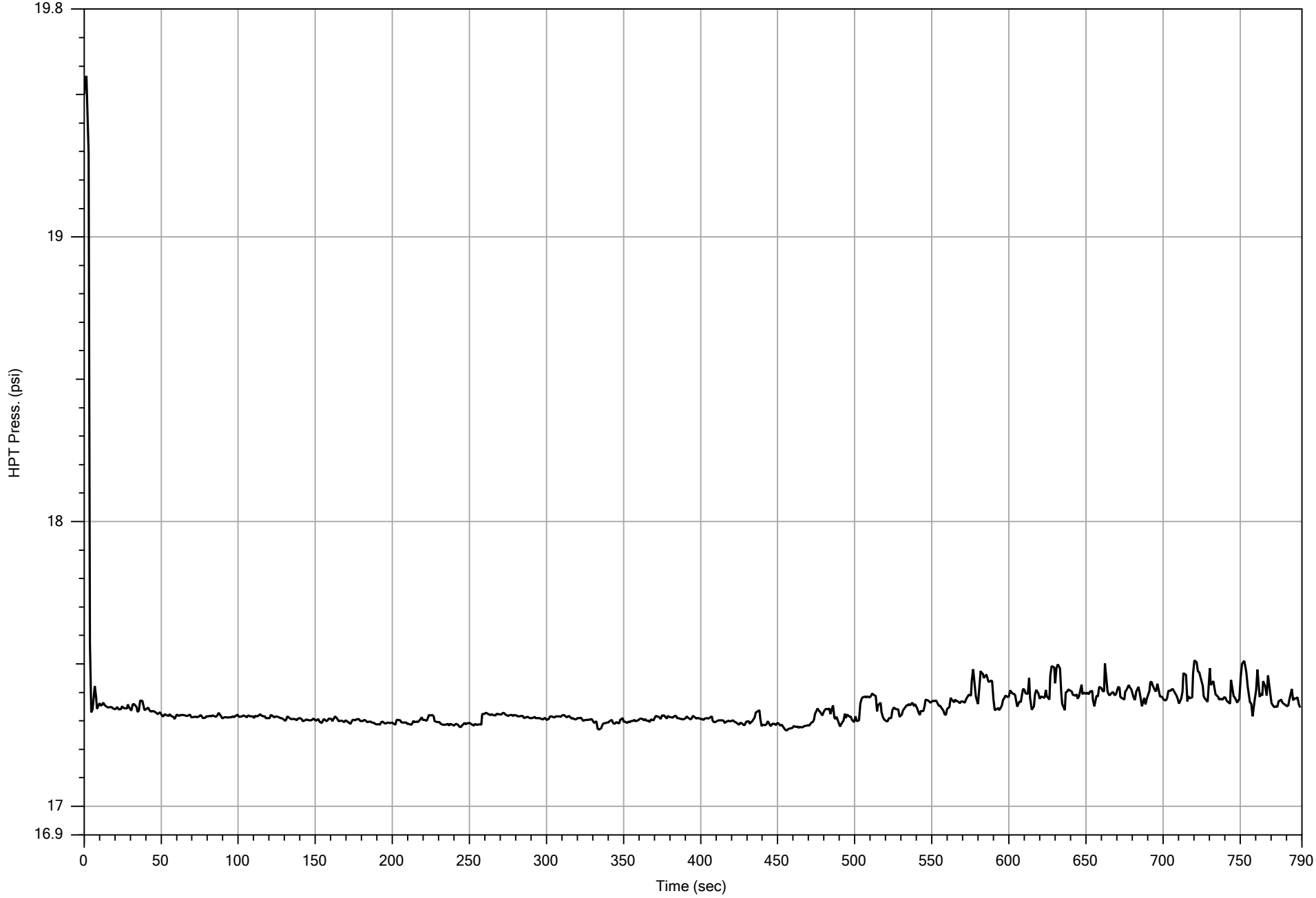
HPT DISSIPATION (SINGLE CASE)

		File: NRS055.TIM	Date: 1/23/2020
Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	Location:	Sensor: HPT Press.
Project ID: 60621225	Client: TVA	Depth: 70.20 ft	Test: 1



AECOM

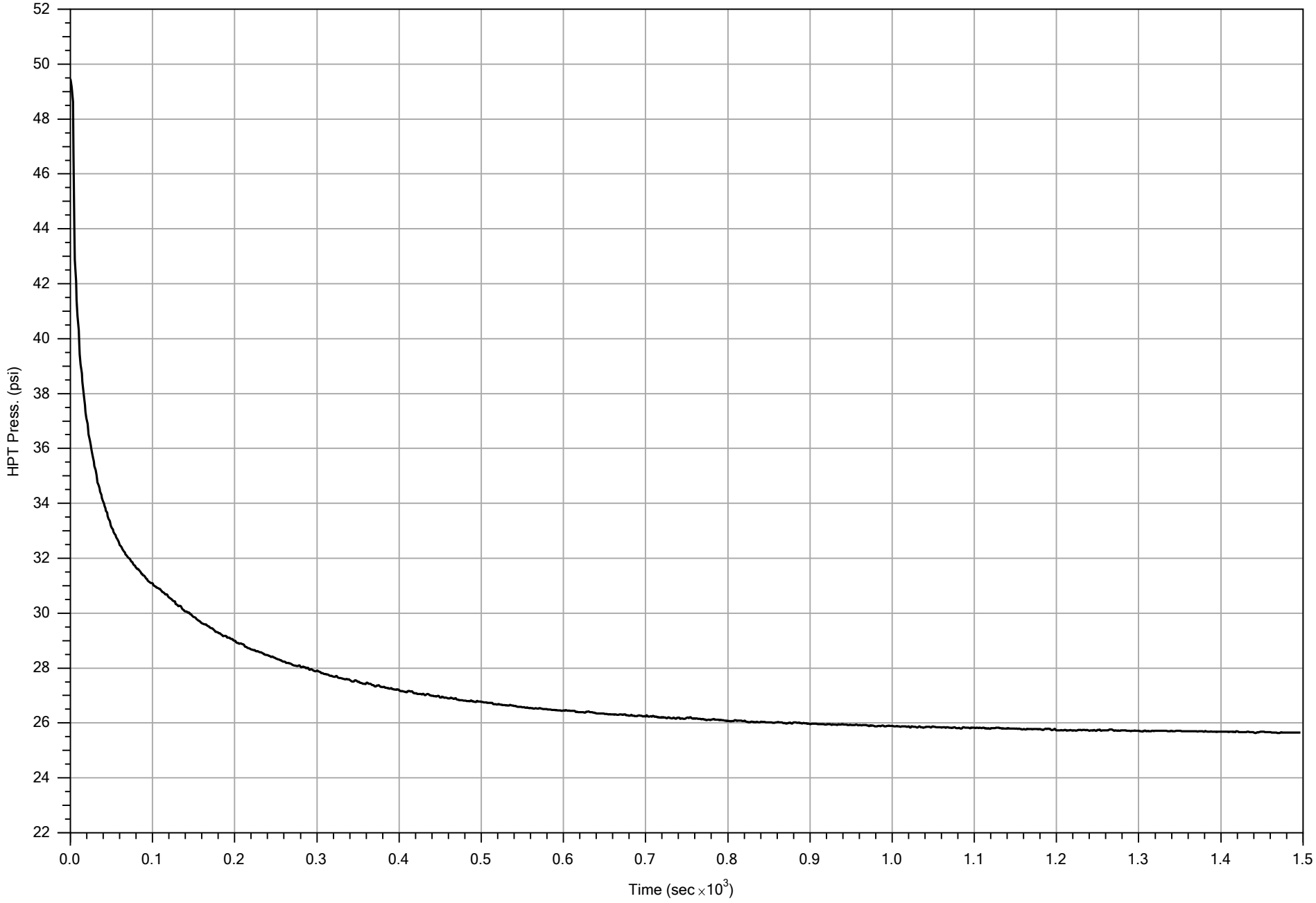
		File: NRS056.HPT
Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	Date: 1/22/2020
Project ID: 60621225	Client: TVA	Location: Gallatin, TN



AECOM

HPT DISSIPATION (SINGLE CASE)

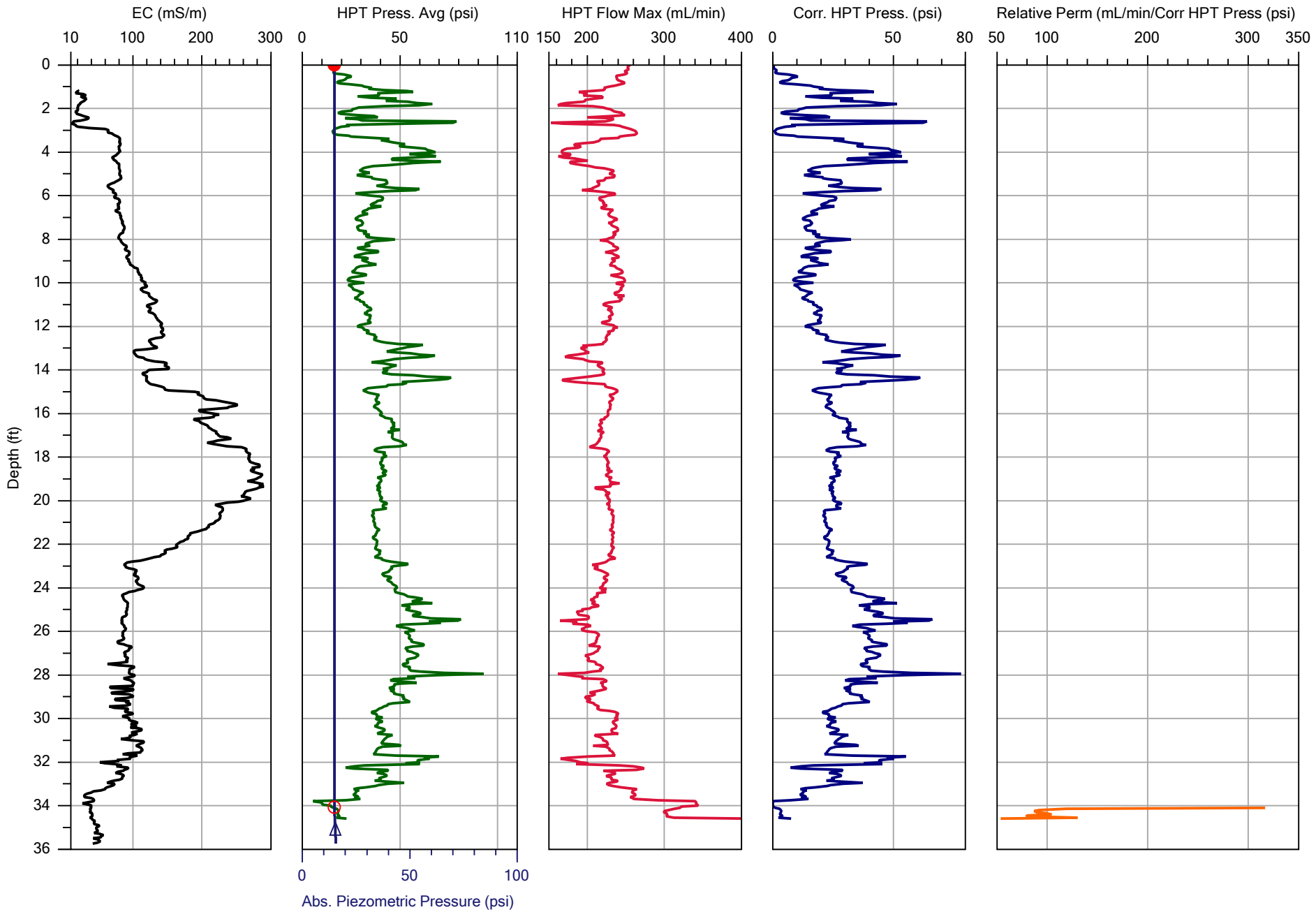
Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	File: NRS056.TIM	Date: 1/22/2020
Project ID: 60621225	Client: TVA	Location:	Sensor: HPT Press.
		Depth: 10.75 ft	Test: 1



AECOM

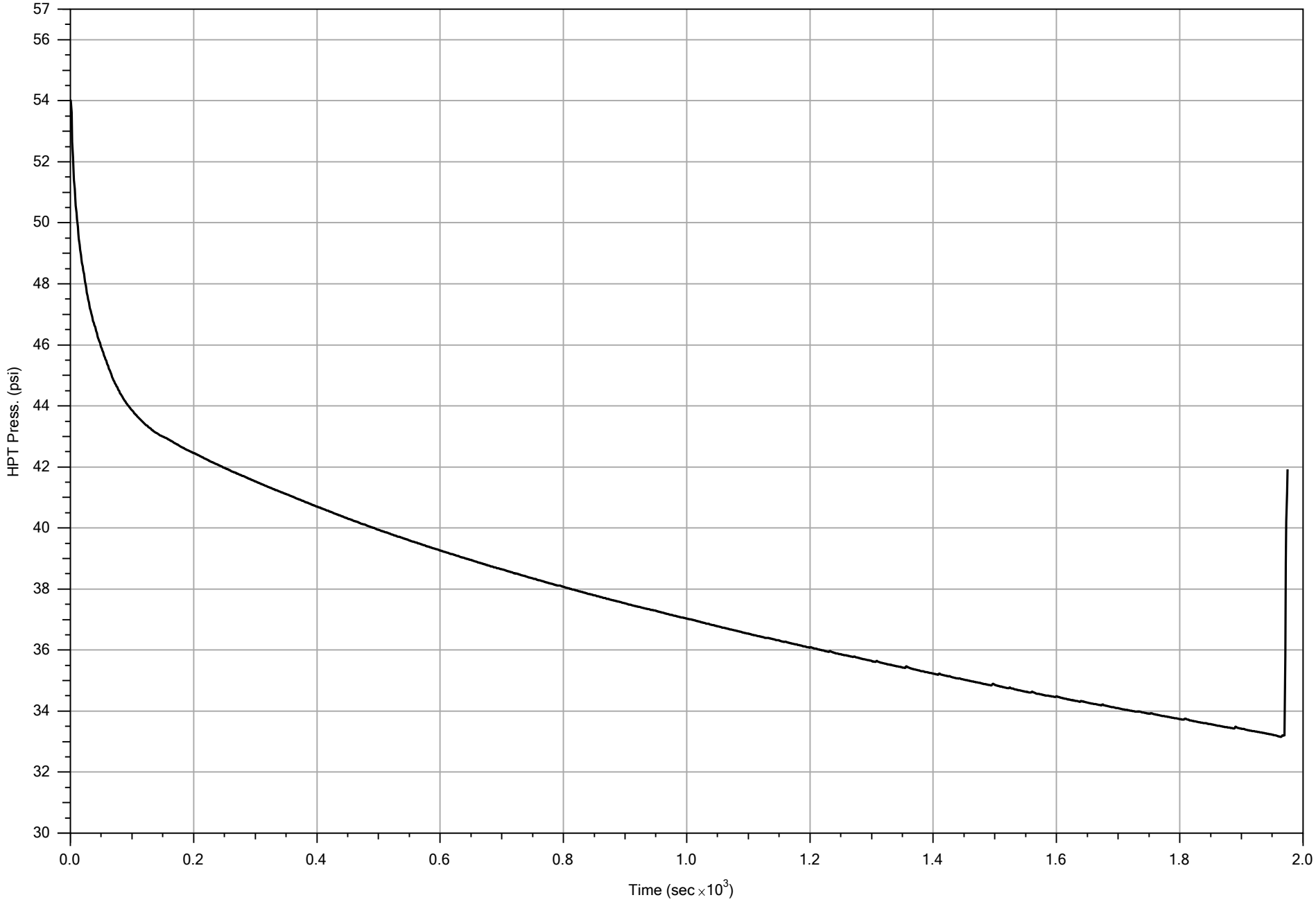
HPT DISSIPATION (SINGLE CASE)

		File: NRS056.TIM	Date: 1/22/2020
Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	Location:	Sensor: HPT Press.
Project ID: 60621225	Client: TVA	Depth: 33.65 ft	Test: 1



AECOM

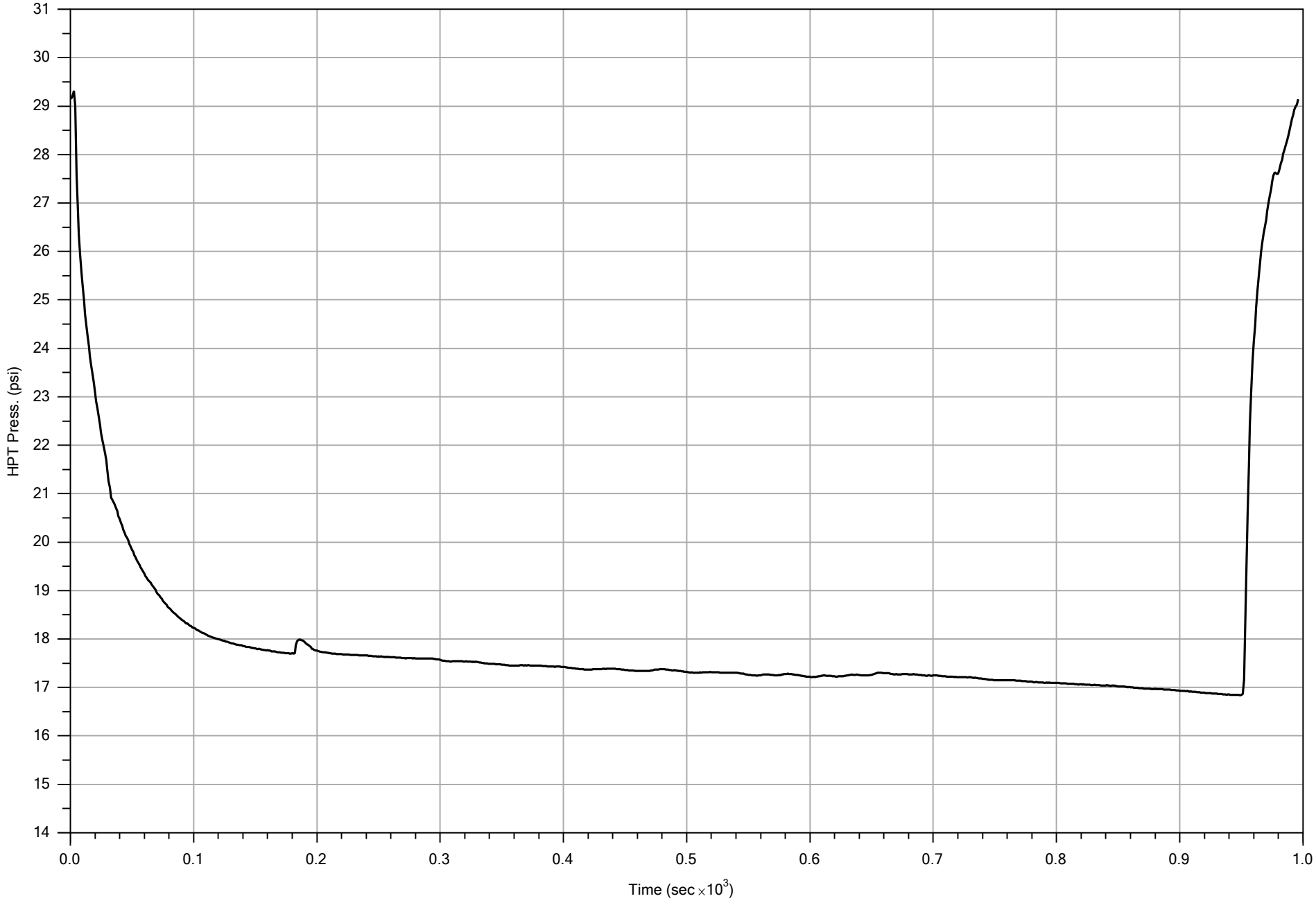
			File: NRS067.HPT
Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)		Date: 1/24/2020
Project ID: 60621225	Client: TVA		Location: Gallatin, TN



AECOM

HPT DISSIPATION (SINGLE CASE)

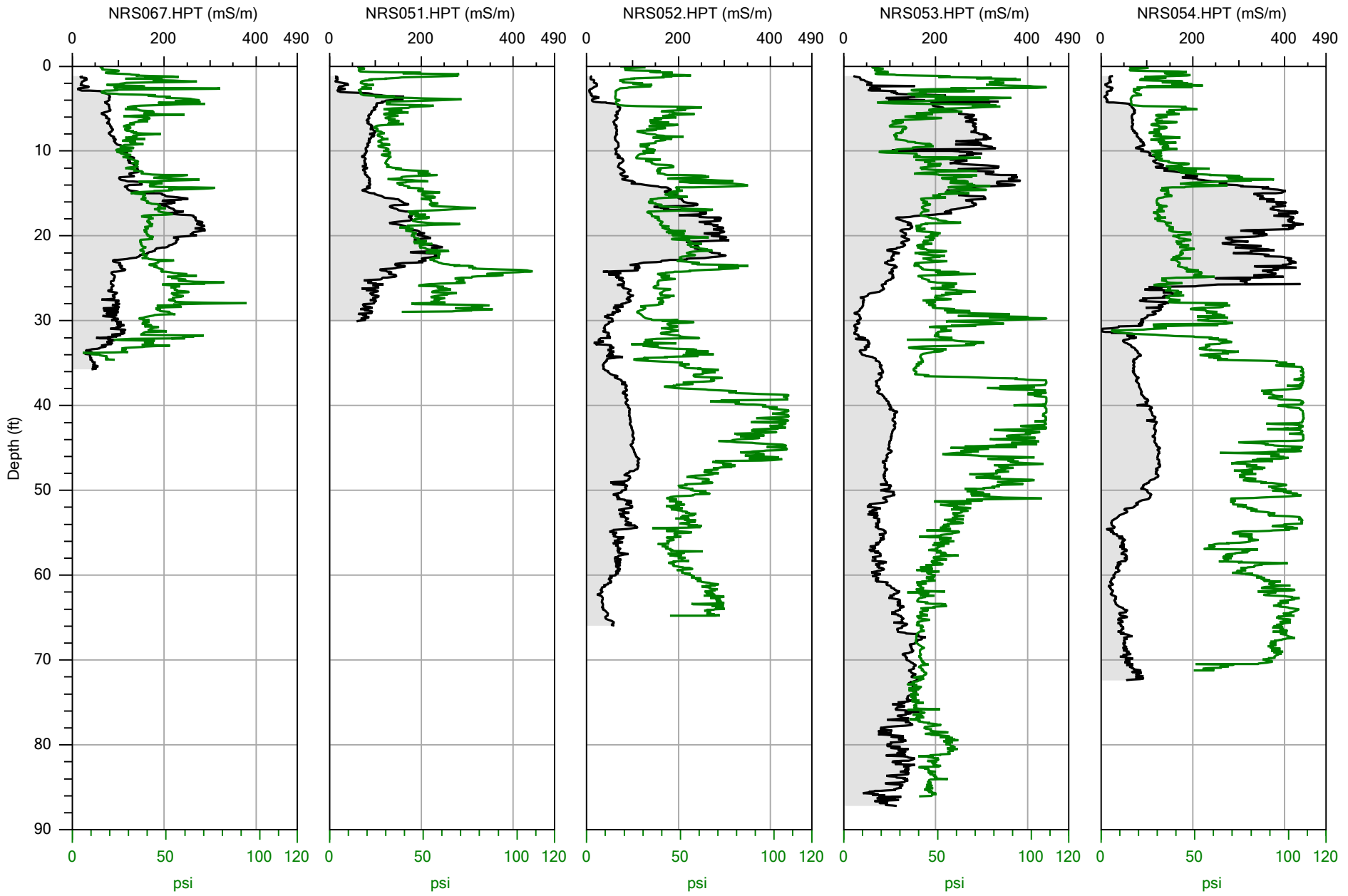
Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	File: NRS067.TIM	Date: 1/24/2020
Project ID: 60621225	Client: TVA	Location:	Sensor: HPT Press.
		Depth: 30.70 ft	Test: 1



AECOM

HPT DISSIPATION (SINGLE CASE)

		File: NRS067.TIM	Date: 1/24/2020
Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	Location:	Sensor: HPT Press.
Project ID: 60621225	Client: TVA	Depth: 34.60 ft	Test: 1

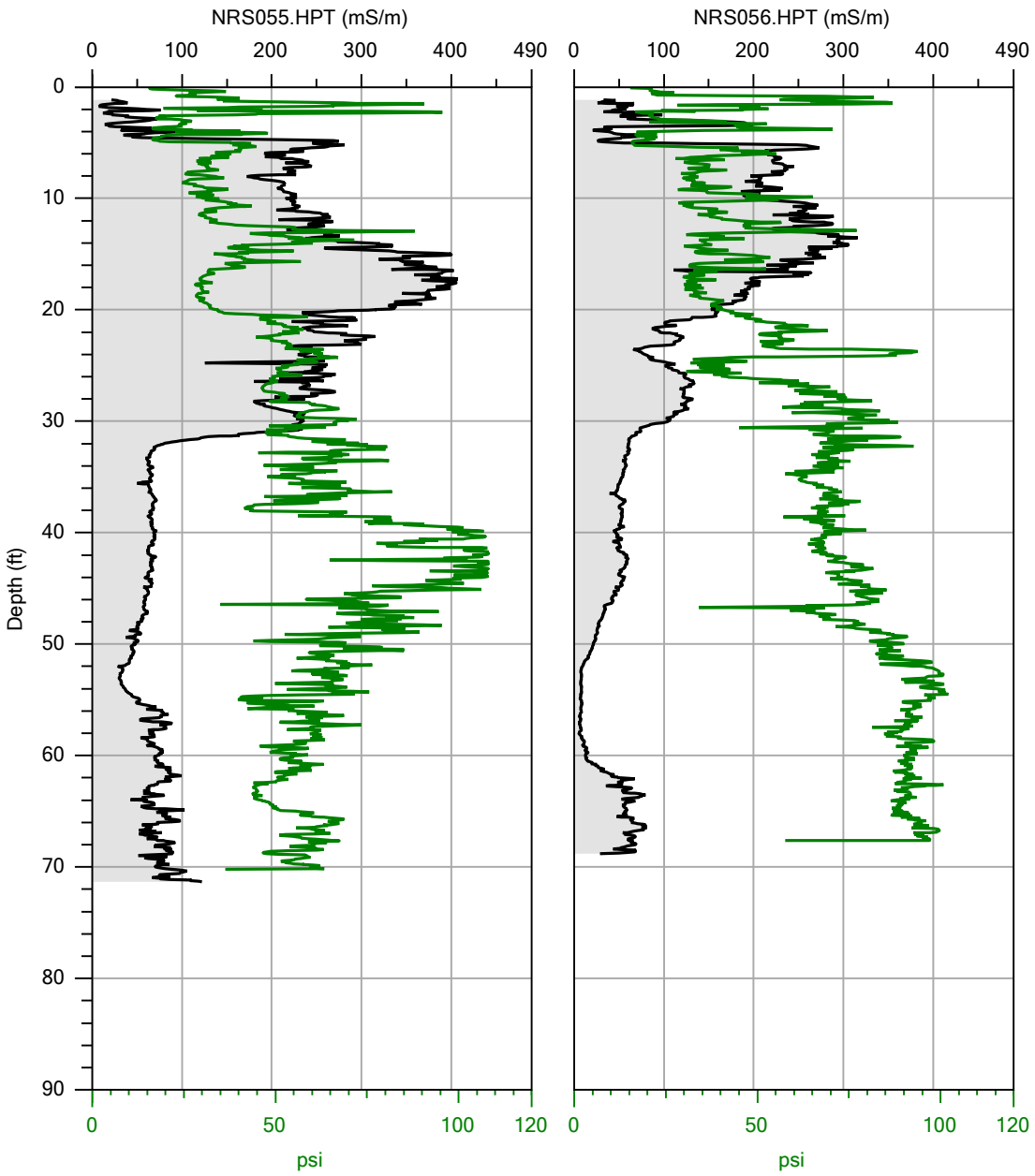


AECOM

EC / HPT Press. Avg

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)
Project ID: 60621225	Client: TVA

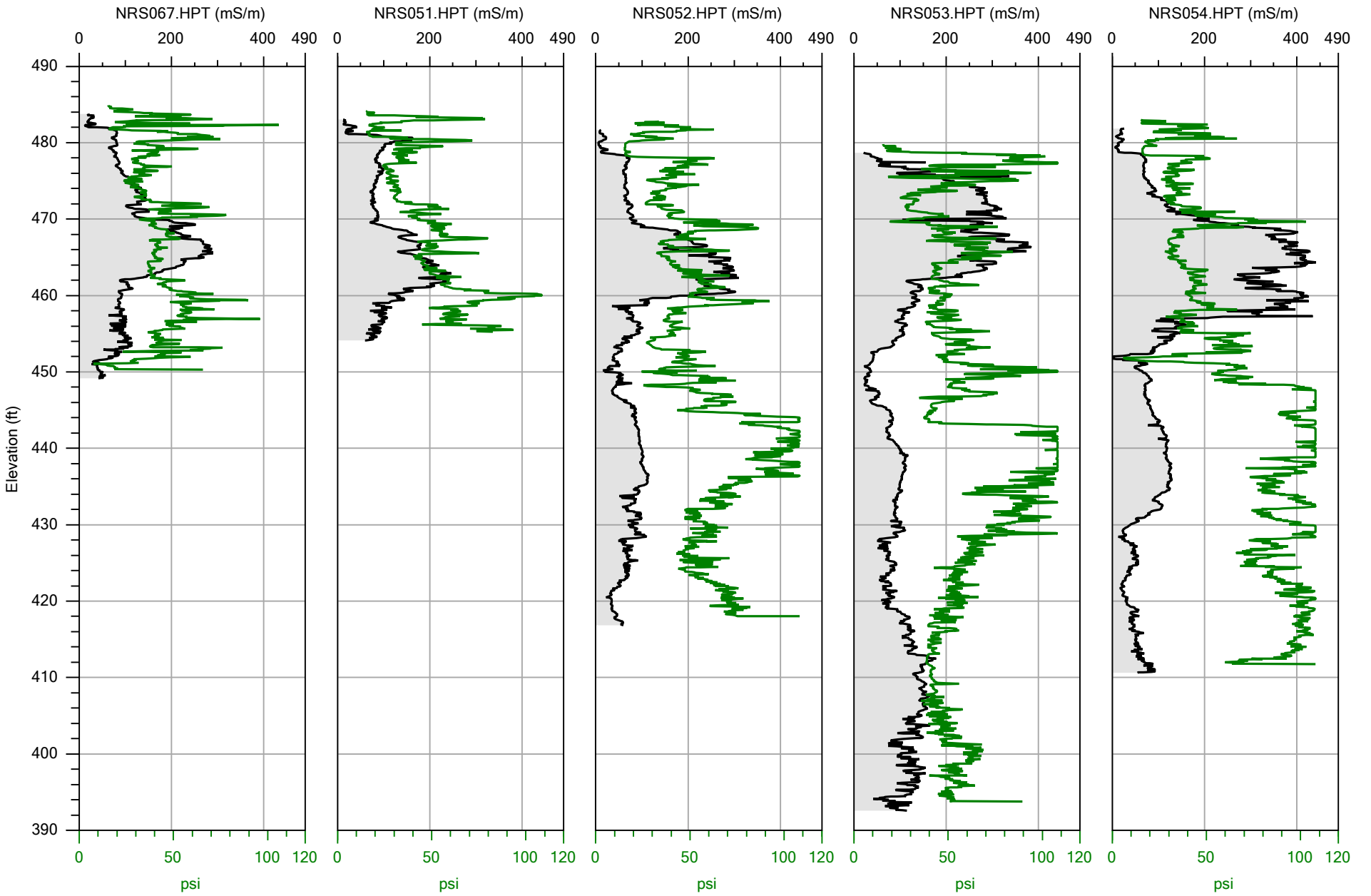
NRS067.HPT	1/24/2020
NRS051.HPT	1/24/2020
NRS052.HPT	1/24/2020
NRS053.HPT	1/23/2020
NRS054.HPT	1/23/2020



AECOM

EC / HPT Press. Avg

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	NRS055.HPT	1/23/2020
Project ID: 60621225	Client: TVA	NRS056.HPT	1/22/2020

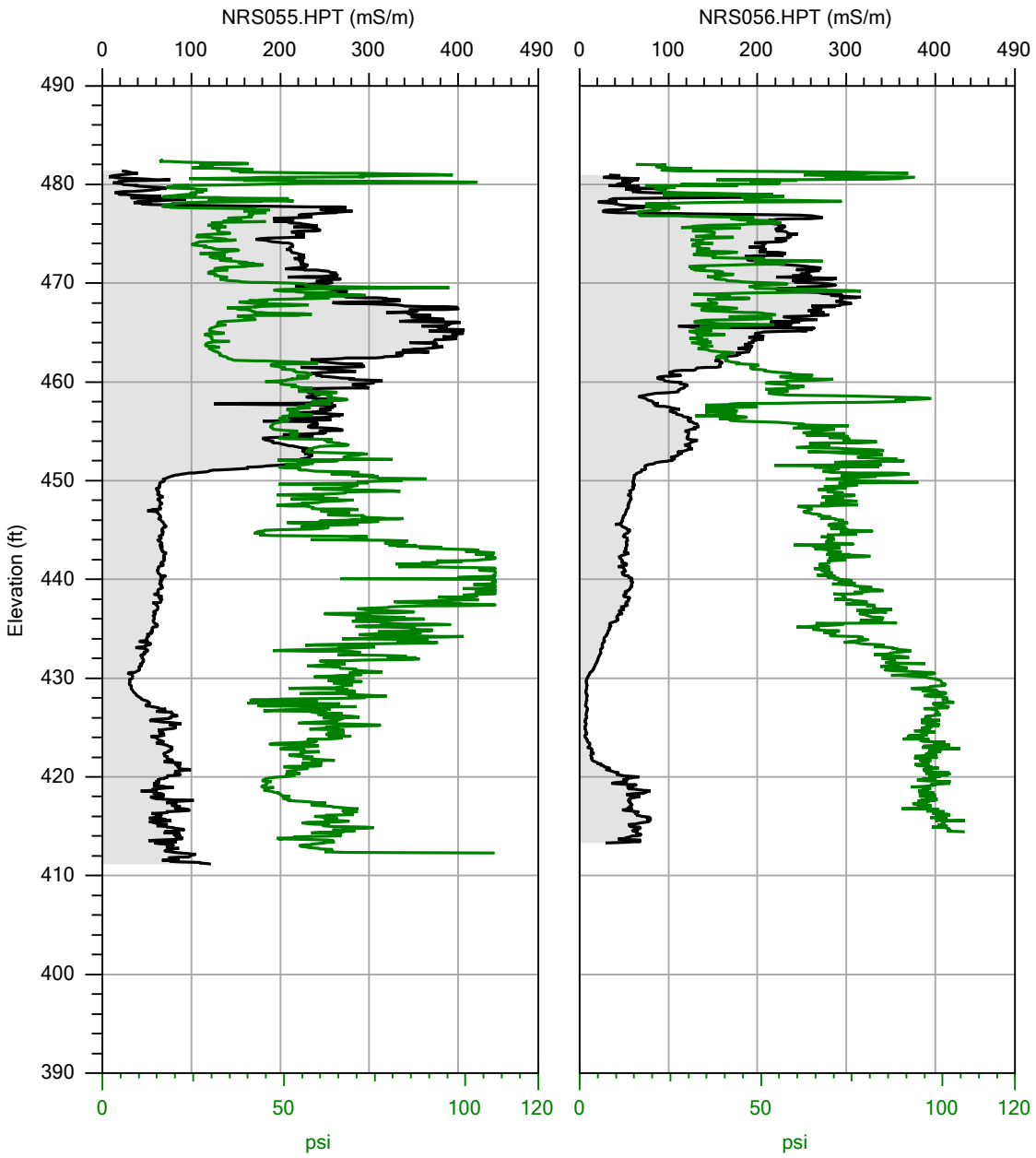


AECOM

EC / HPT Press. Max

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)
Project ID: 60621225	Client: TVA

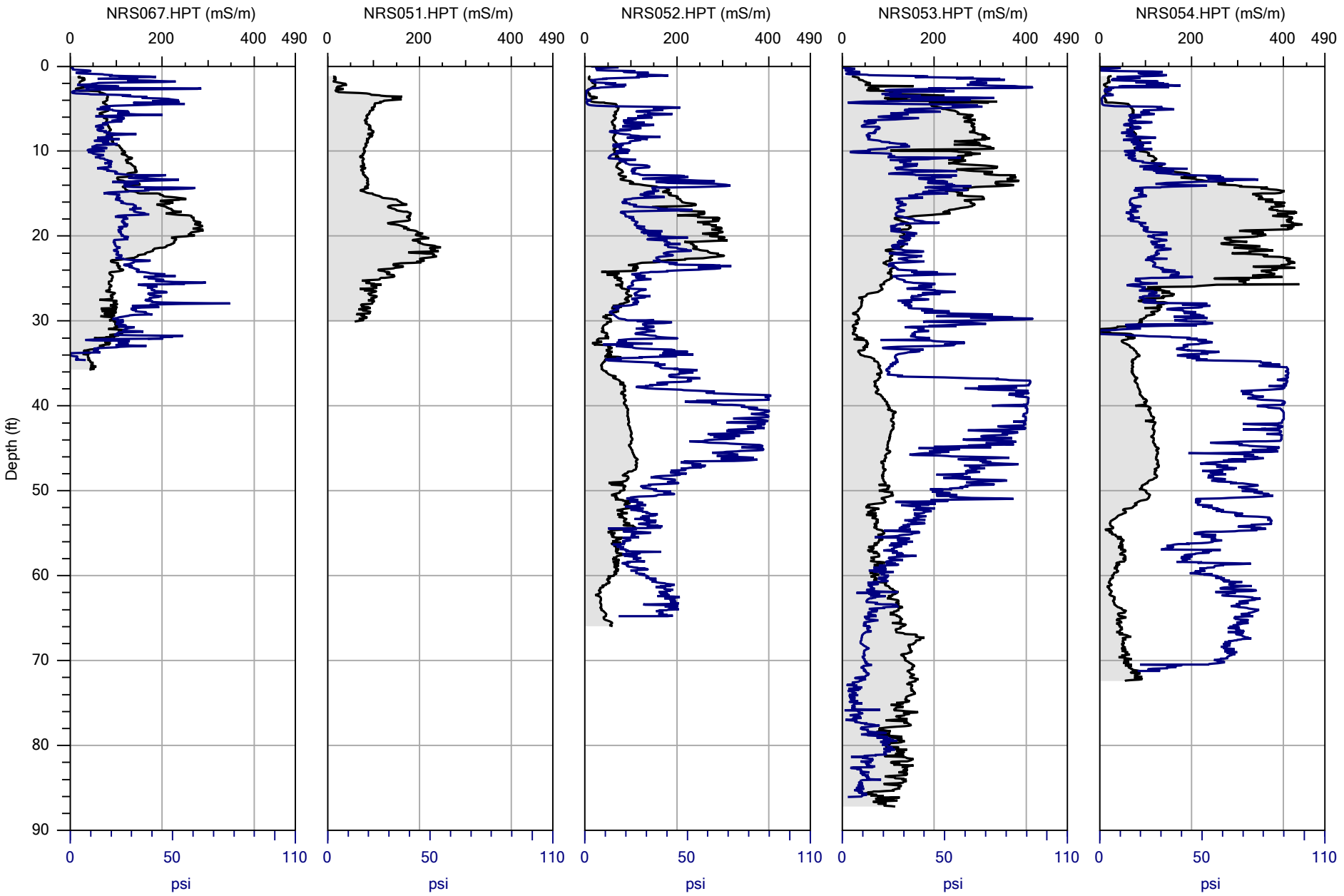
NRS067.HPT	1/24/2020
NRS051.HPT	1/24/2020
NRS052.HPT	1/24/2020
NRS053.HPT	1/23/2020
NRS054.HPT	1/23/2020



AECOM

EC / HPT Press. Max

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	NRS055.HPT	1/23/2020
Project ID: 60621225	Client: TVA	NRS056.HPT	1/22/2020

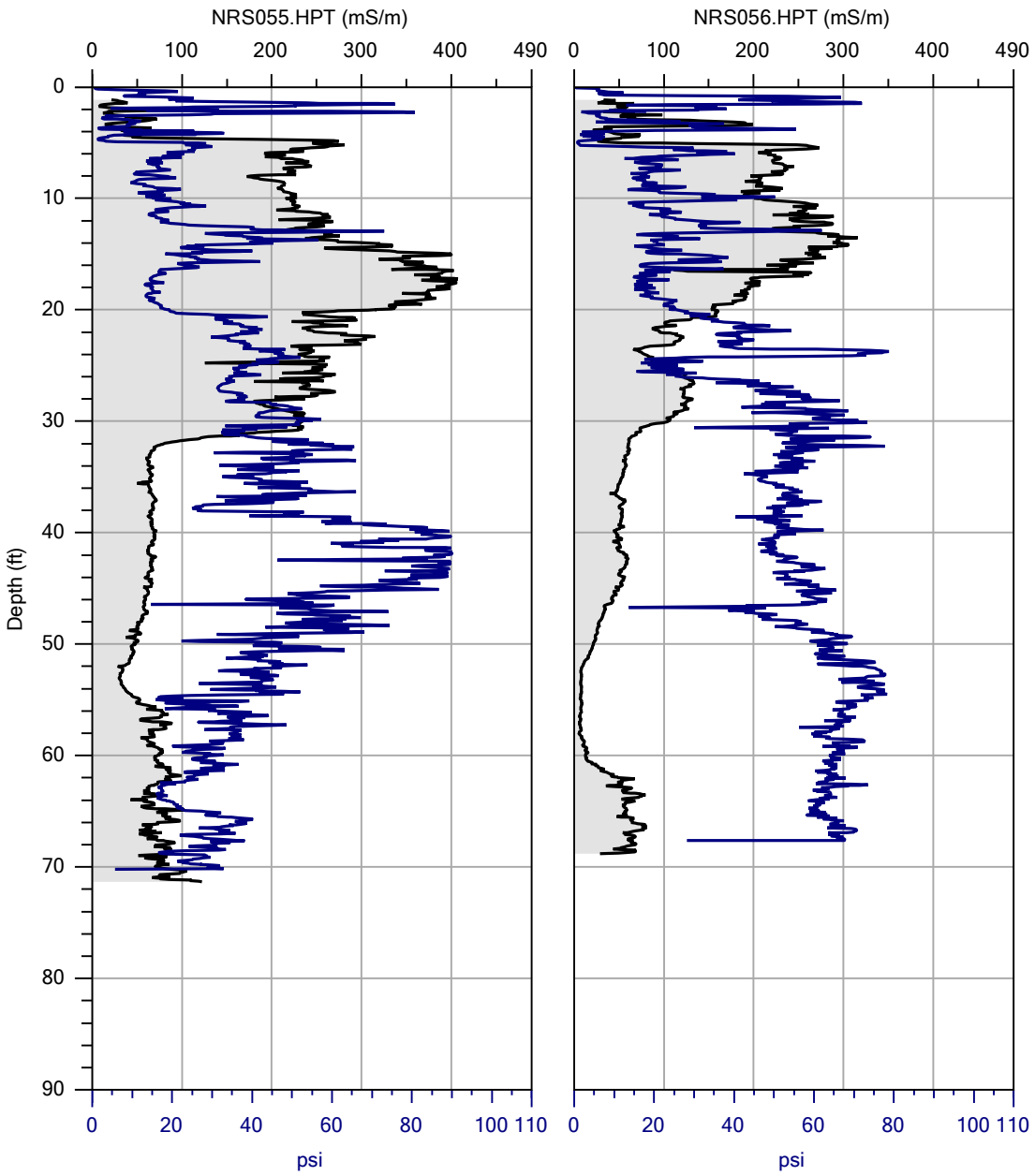


AECOM

EC / Corr. HPT Press.

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)
Project ID: 60621225	Client: TVA

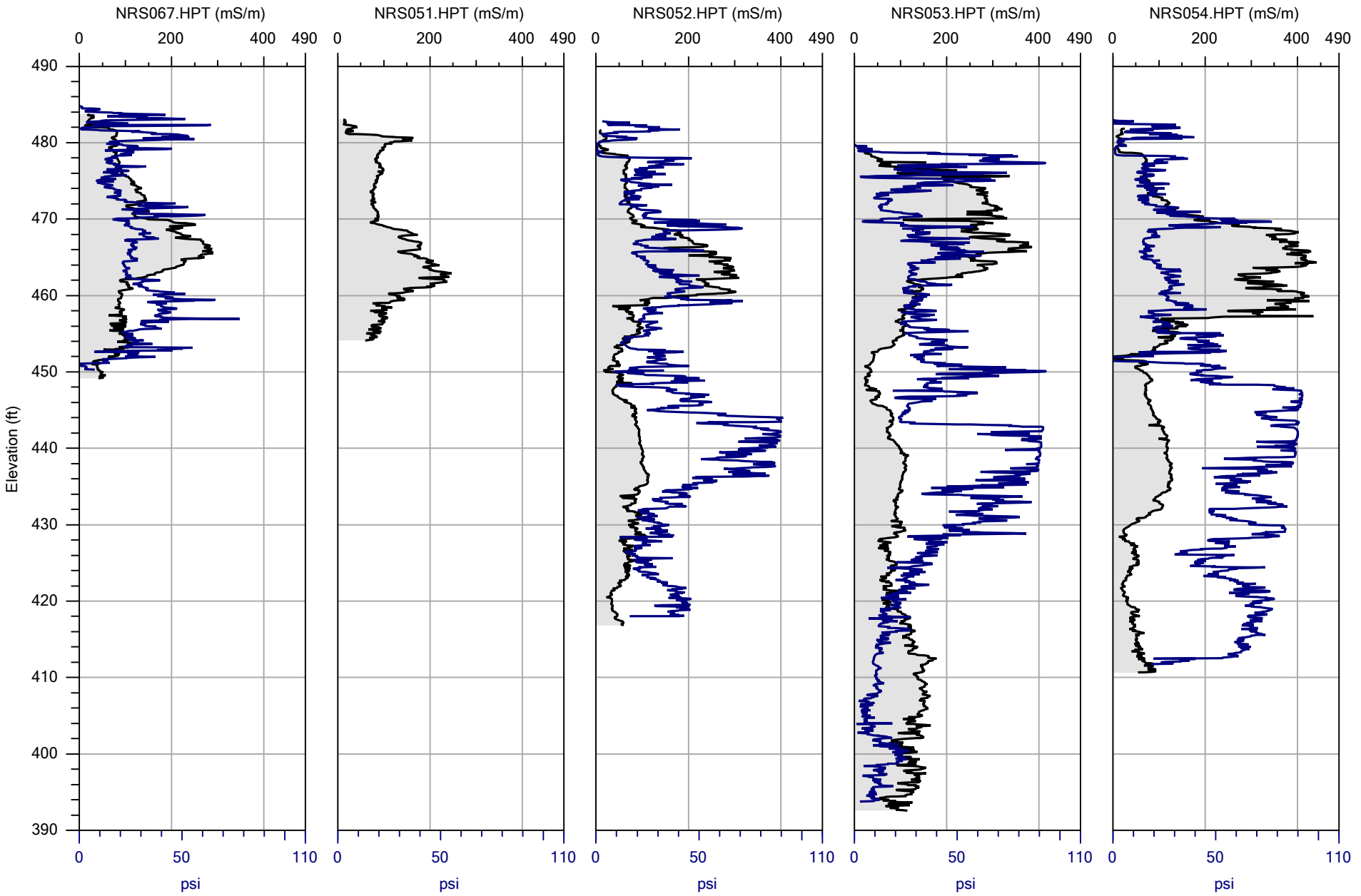
NRS067.HPT	1/24/2020
NRS051.HPT	1/24/2020
NRS052.HPT	1/24/2020
NRS053.HPT	1/23/2020
NRS054.HPT	1/23/2020



AECOM

EC / Corr. HPT Press.

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	NRS055.HPT 1/23/2020
Project ID: 60621225	Client: TVA	NRS056.HPT 1/22/2020

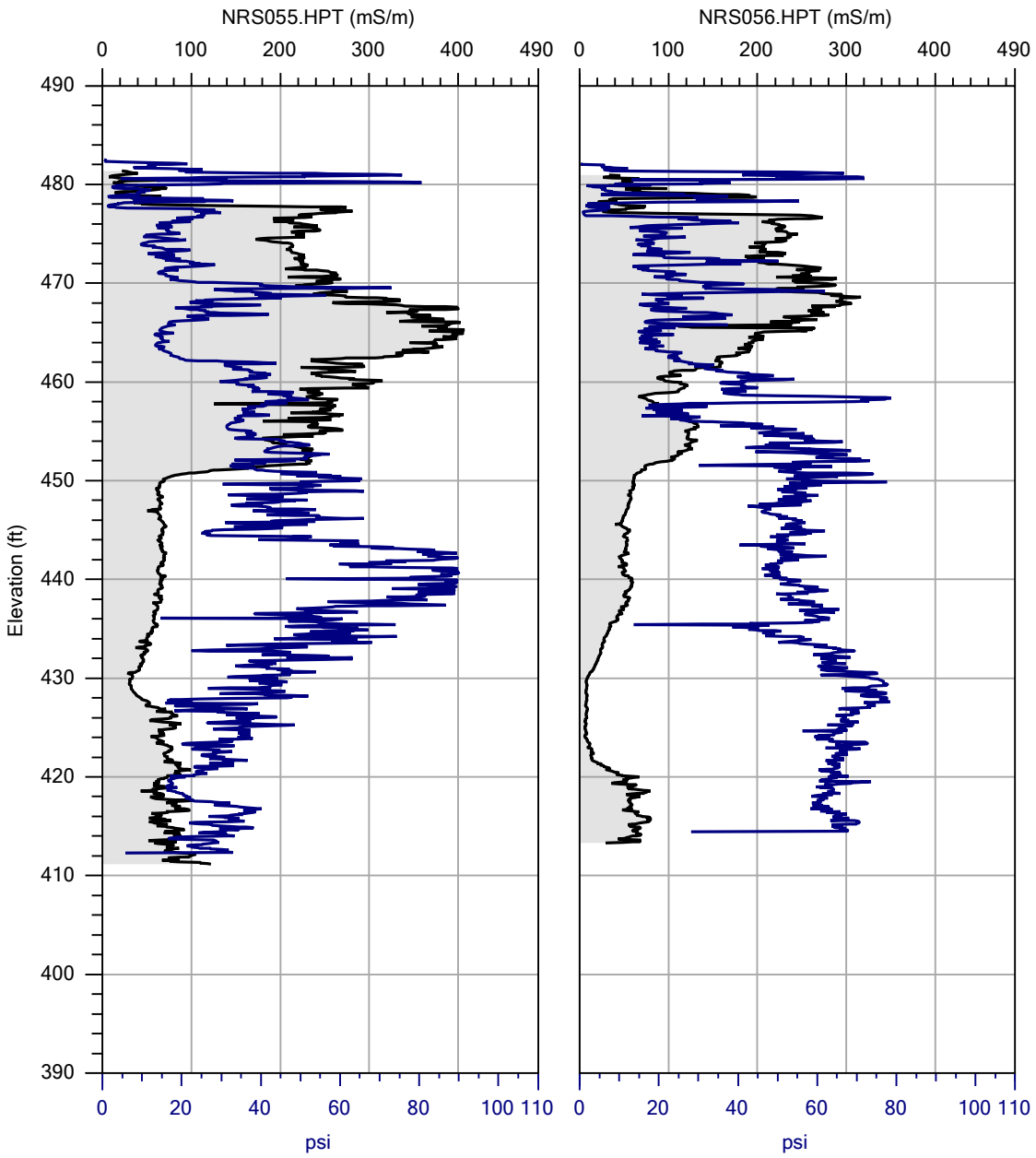


AECOM

EC / Corr. HPT Press.

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING
Project ID: 60621225	Client: TVA

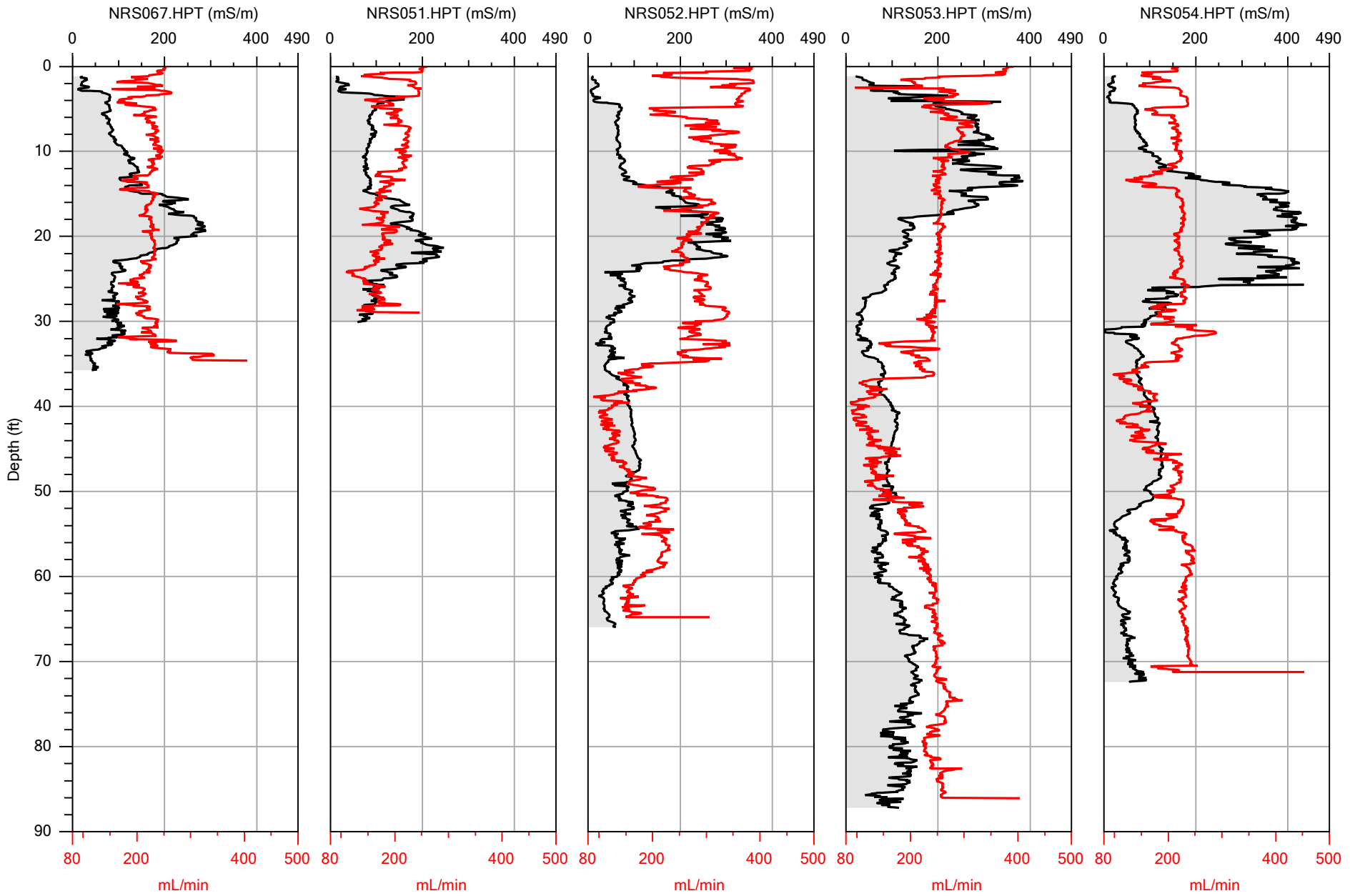
NRS067.HPT	1/24/2020
NRS051.HPT	1/24/2020
NRS052.HPT	1/24/2020
NRS053.HPT	1/23/2020
NRS054.HPT	1/23/2020



AECOM

EC / Corr. HPT Press.

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	NRS055.HPT 1/23/2020
Project ID: 60621225	Client: TVA	NRS056.HPT 1/22/2020

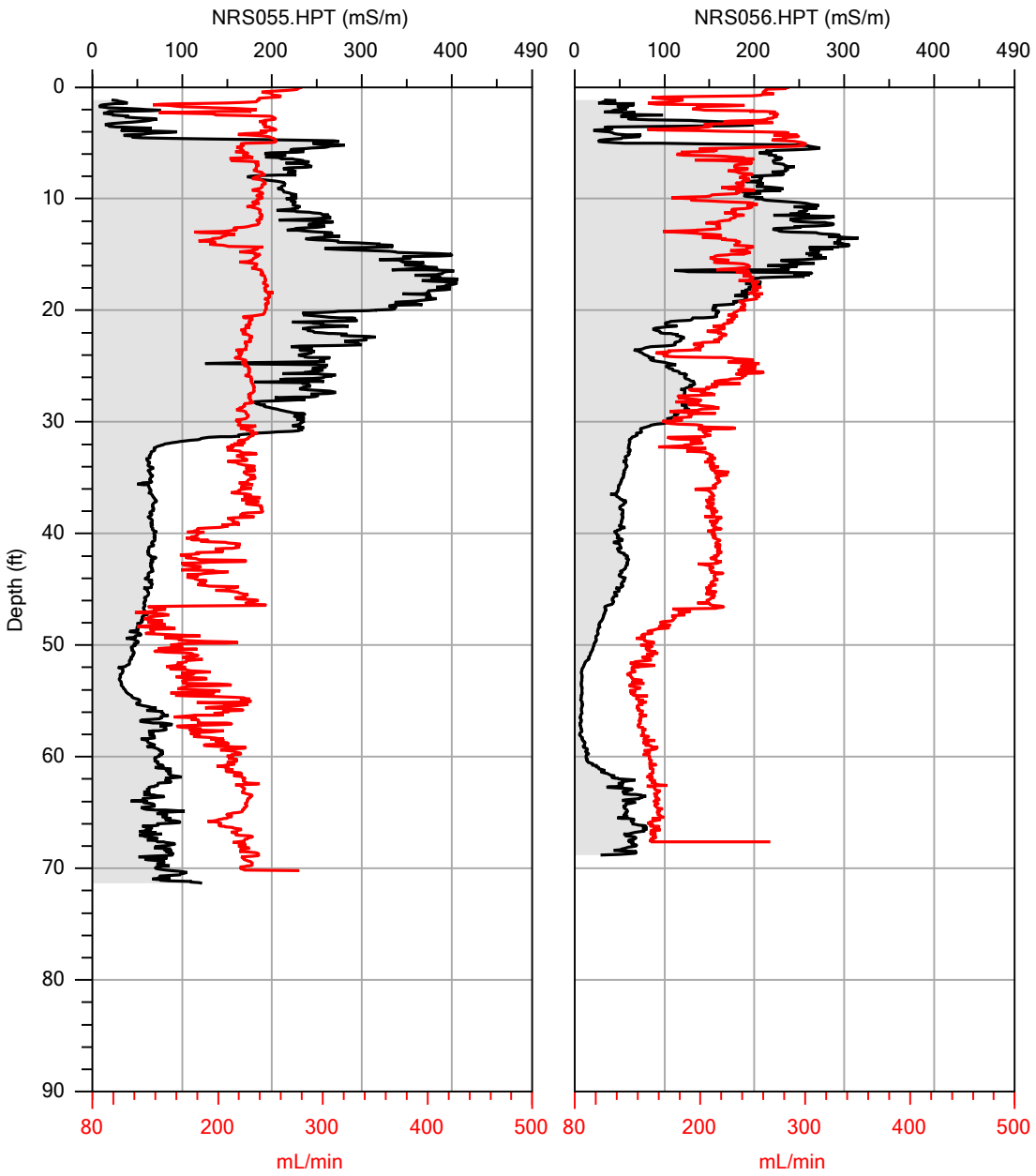


AECOM

EC / HPT Flow Max

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)
Project ID: 60621225	Client: TVA

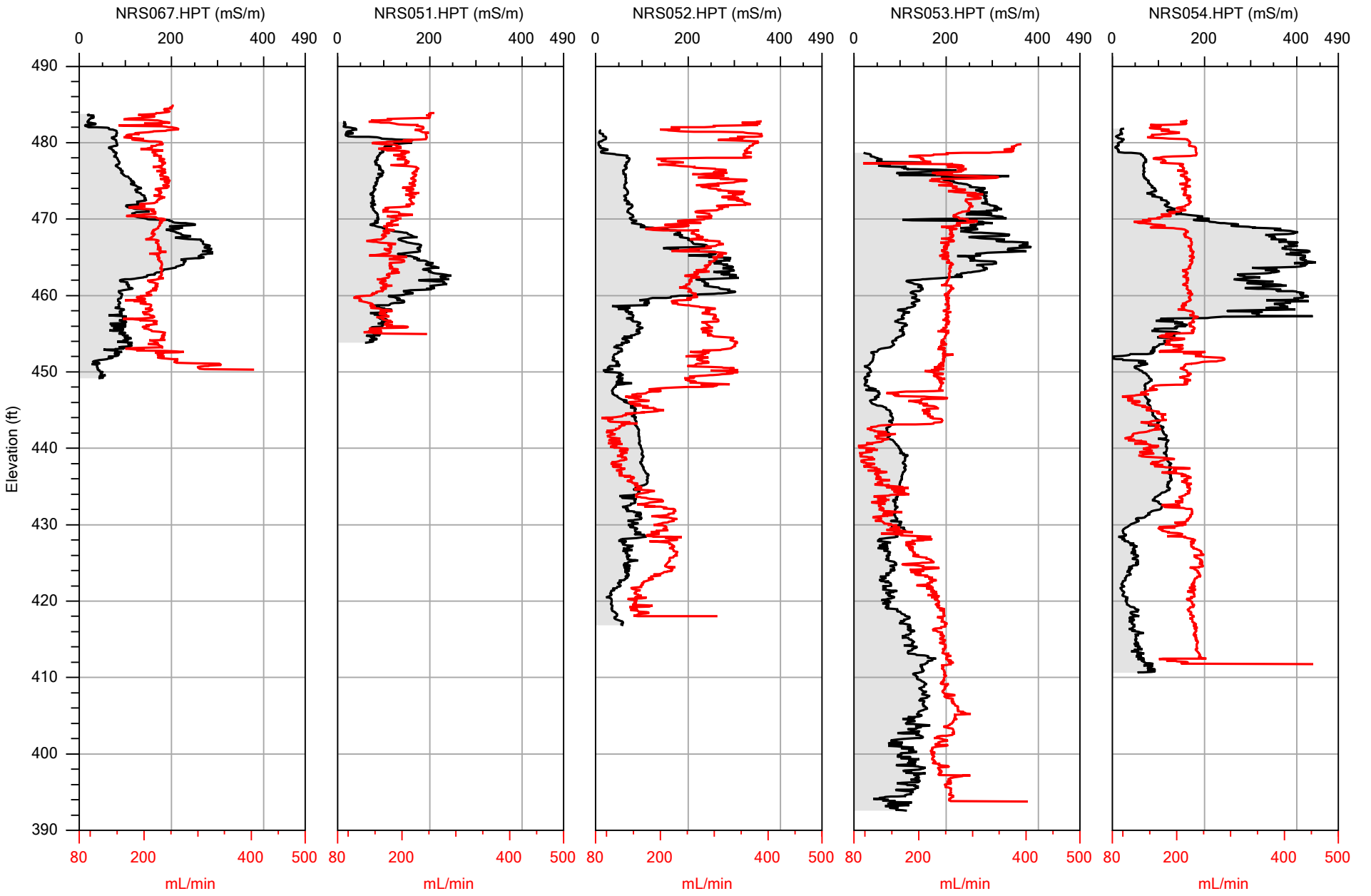
NRS067.HPT	1/24/2020
NRS051.HPT	1/24/2020
NRS052.HPT	1/24/2020
NRS053.HPT	1/23/2020
NRS054.HPT	1/23/2020



AECOM

EC / HPT Flow Max

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	NRS055.HPT 1/23/2020
Project ID: 60621225	Client: TVA	NRS056.HPT 1/22/2020

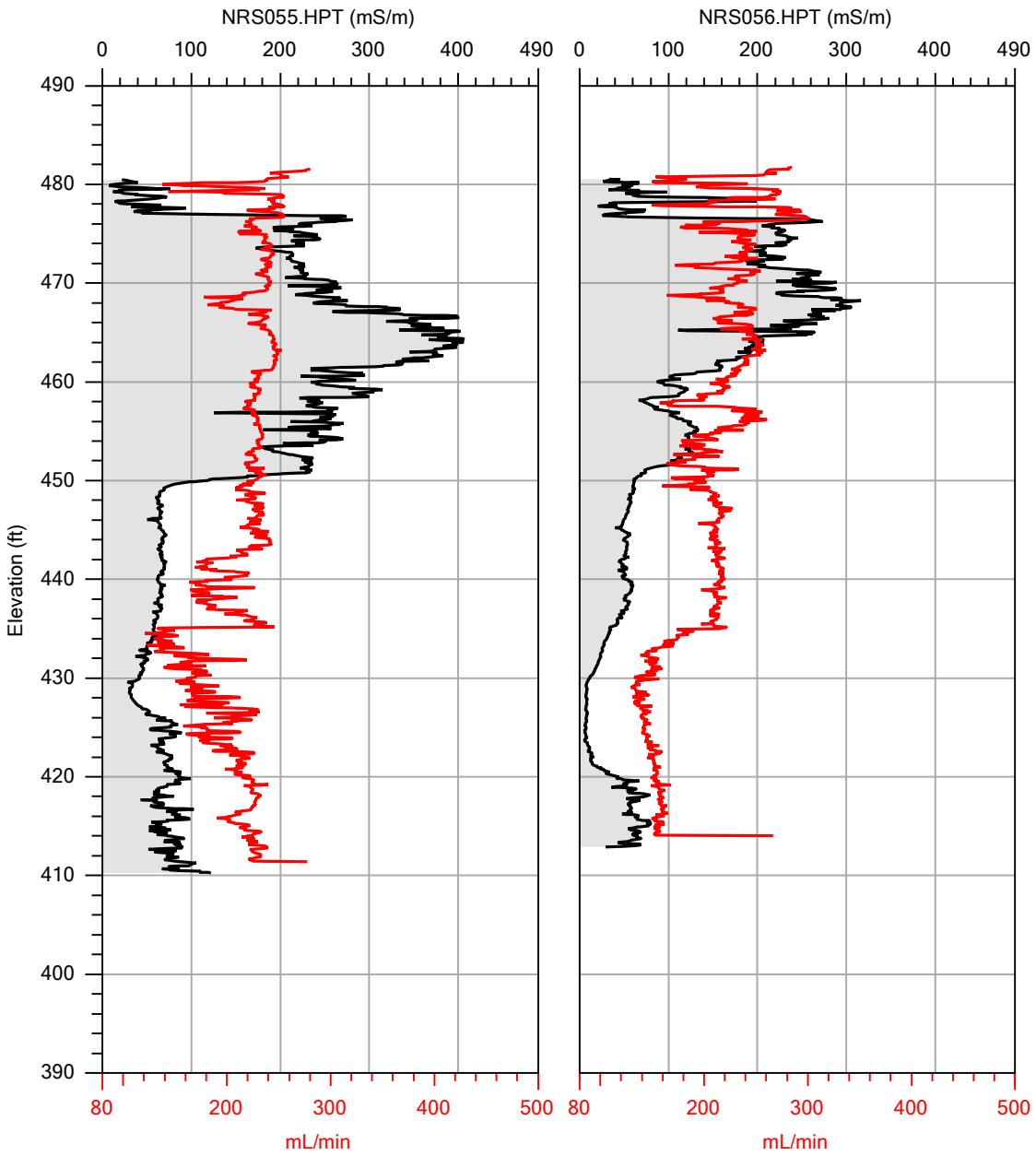


AECOM

EC / HPT Flow Max

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)
Project ID: 60621225	Client: TVA

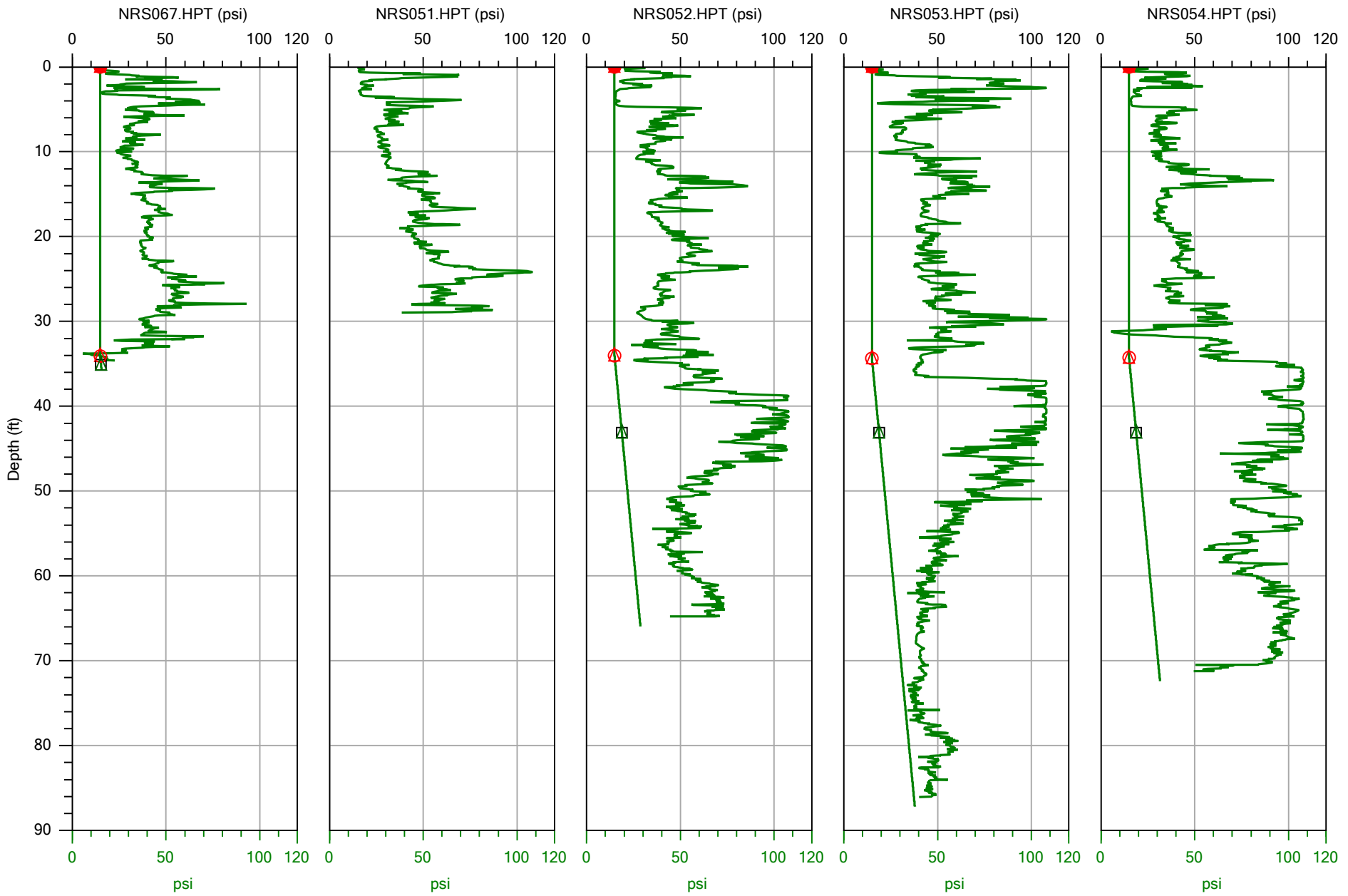
NRS067.HPT	1/24/2020
NRS051.HPT	1/24/2020
NRS052.HPT	1/24/2020
NRS053.HPT	1/23/2020
NRS054.HPT	1/23/2020



AECOM

EC / HPT Flow Max

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	NRS055.HPT	1/23/2020
Project ID: 60621225	Client: TVA	NRS056.HPT	1/22/2020

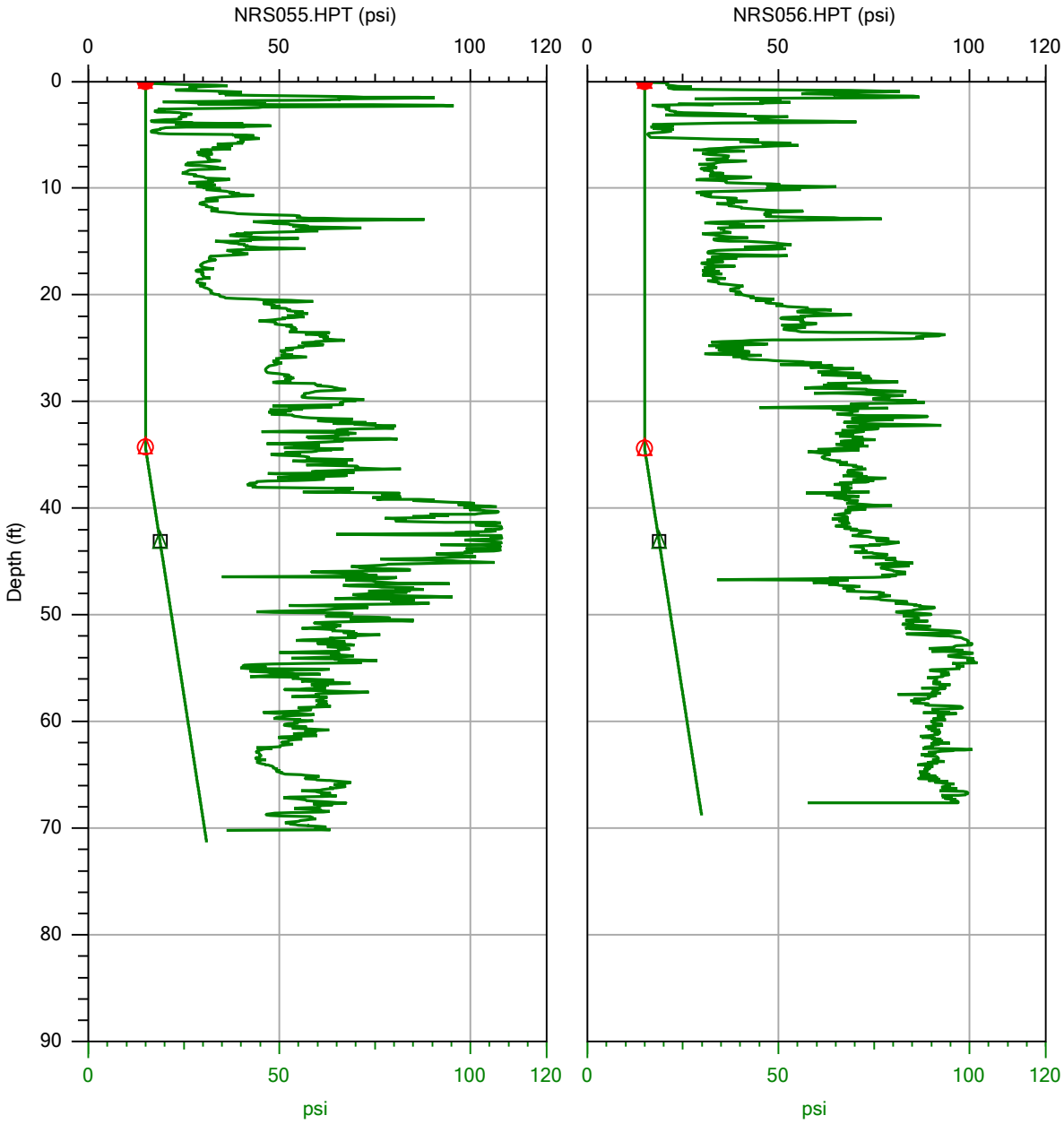


AECOM

HPT Press. Avg / Abs. Piezometric Pressure

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)
Project ID: 60621225	Client: TVA

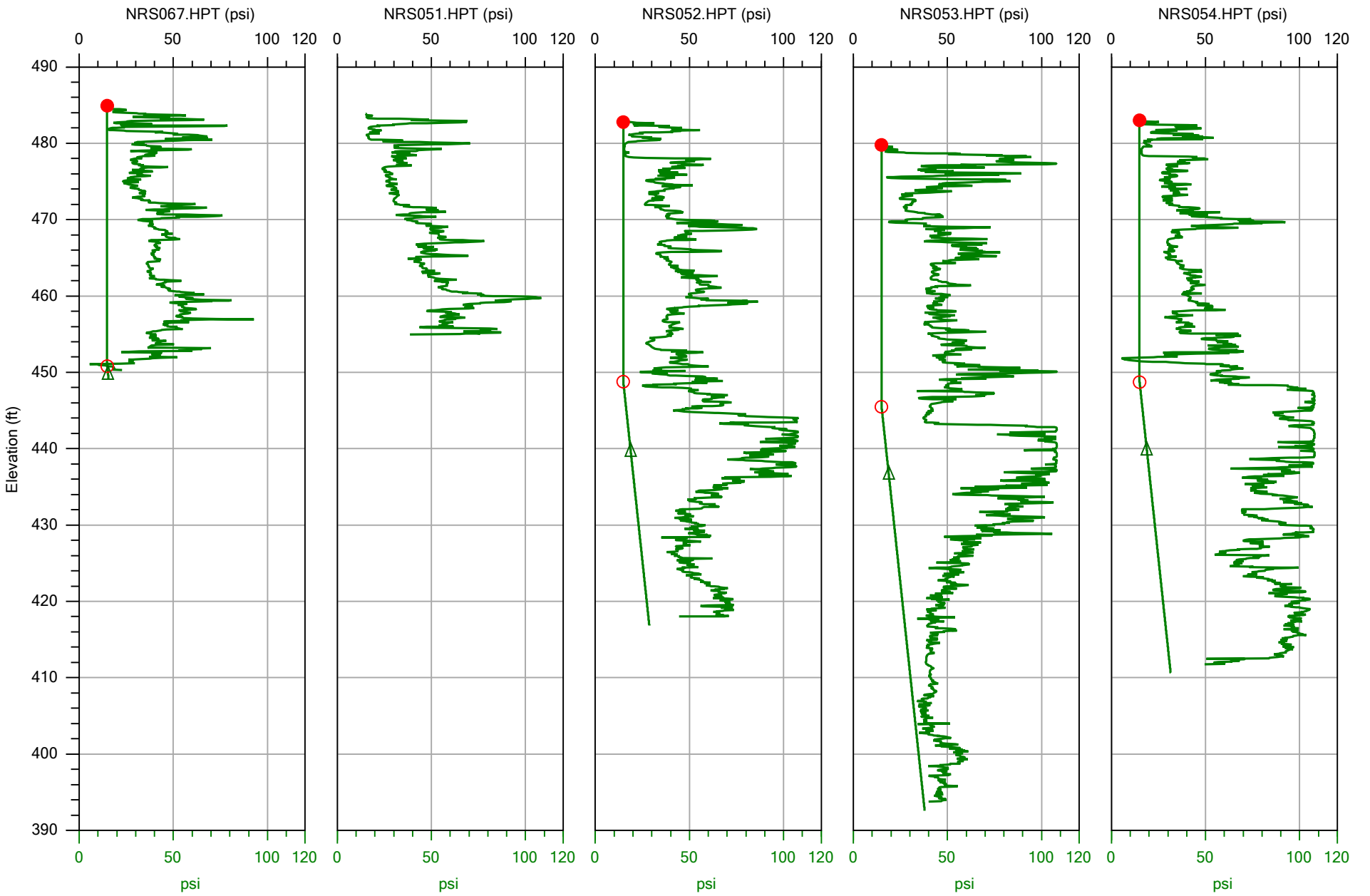
NRS067.HPT	1/24/2020
NRS051.HPT	1/24/2020
NRS052.HPT	1/24/2020
NRS053.HPT	1/23/2020
NRS054.HPT	1/23/2020



AECOM

HPT Press. Avg / Abs. Piezometric Pressure

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	NRS055.HPT	1/23/2020
Project ID: 60621225	Client: TVA	NRS056.HPT	1/22/2020

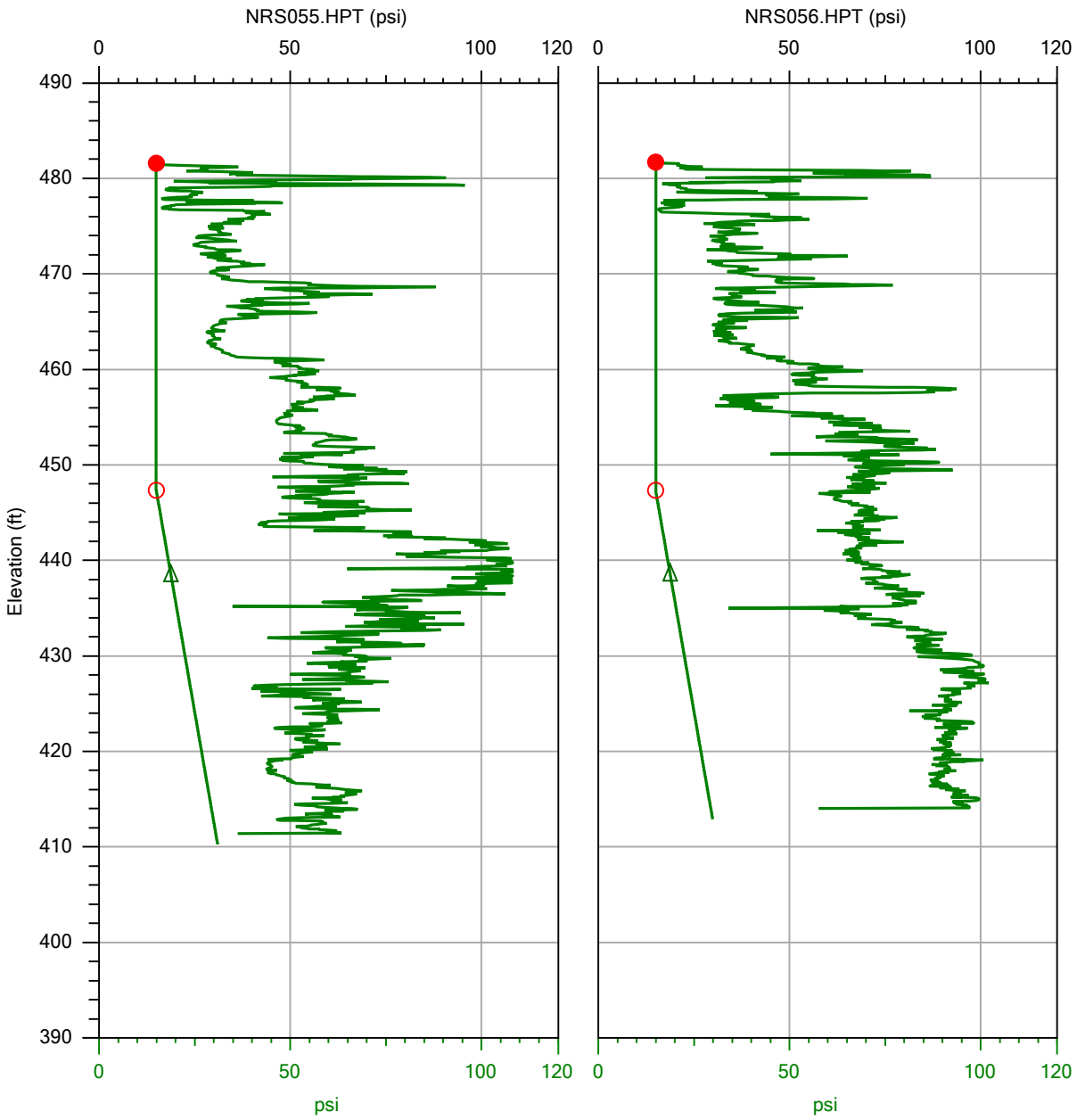


AECOM

HPT Press. Avg / Abs. Piezometric Pressure

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)
Project ID: 60621225	Client: TVA

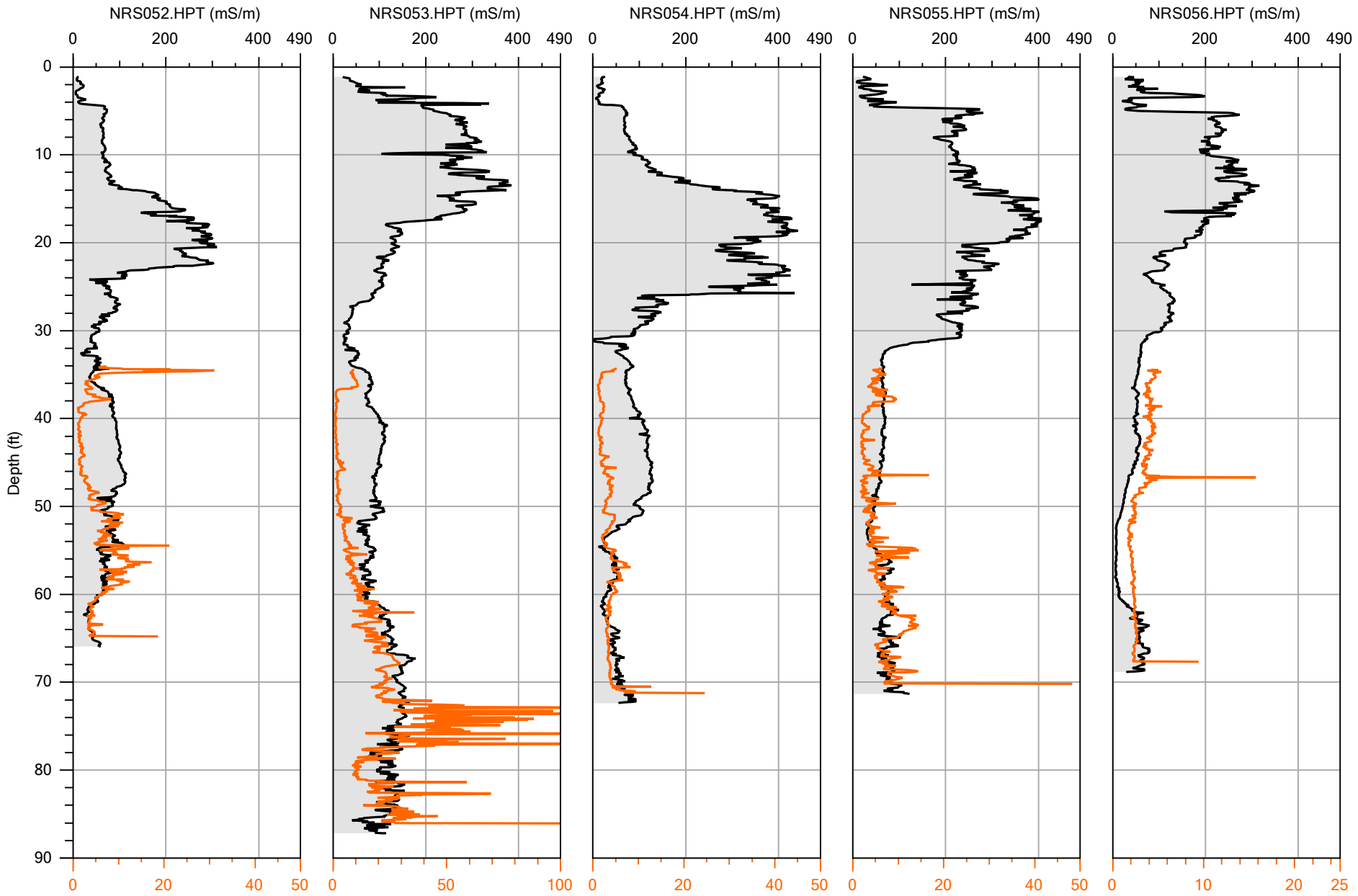
NRS067.HPT	1/24/2020
NRS051.HPT	1/24/2020
NRS052.HPT	1/24/2020
NRS053.HPT	1/23/2020
NRS054.HPT	1/23/2020



AECOM

HPT Press. Avg / Abs. Piezometric Pressure

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)	NRS055.HPT	1/23/2020
Project ID: 60621225	Client: TVA	NRS056.HPT	1/22/2020

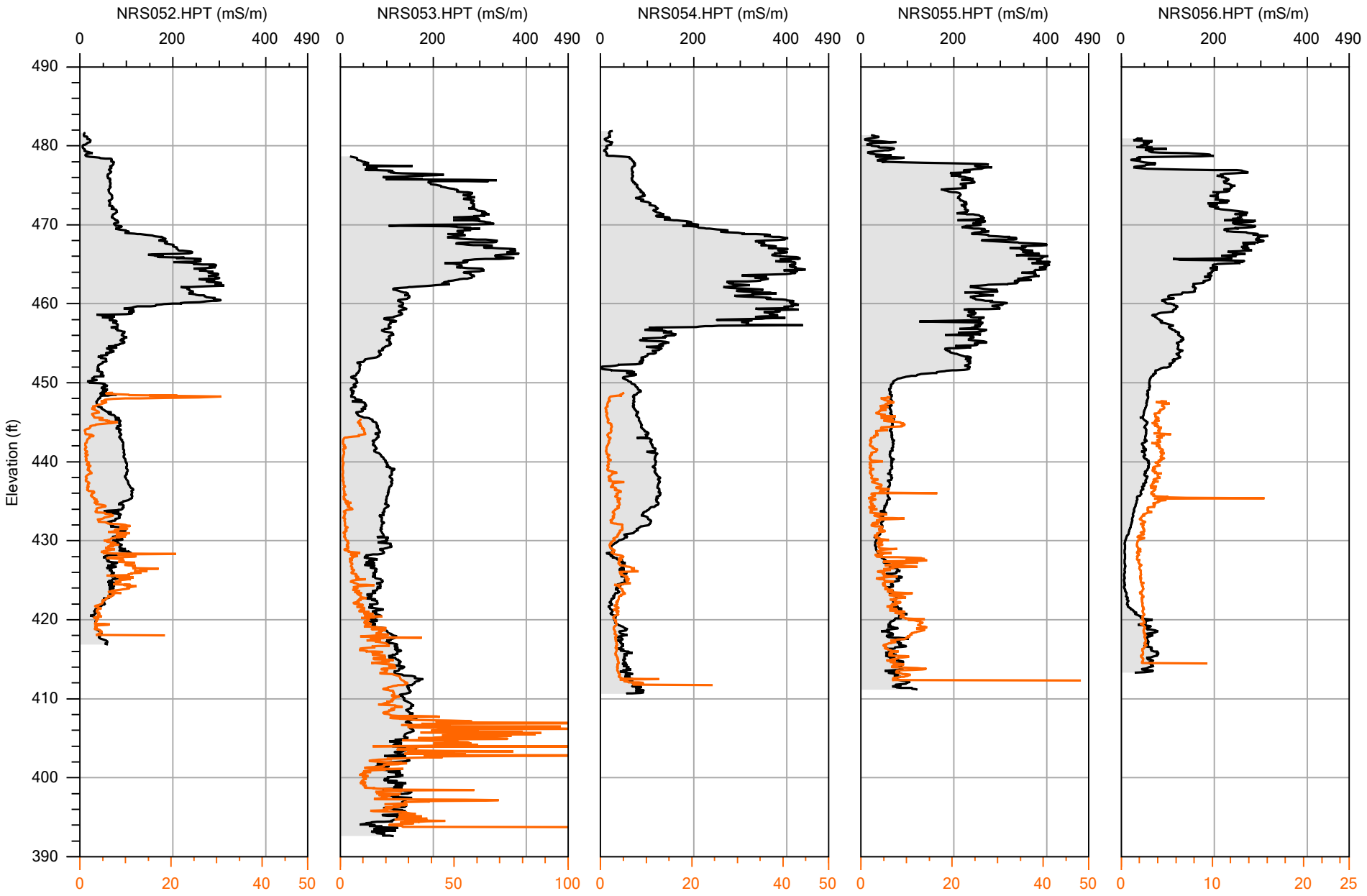


AECOM

EC / Relative Perm (mL/min/Corr HPT Press (psi)

Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)
Project ID: 60621225	Client: TVA

NRS052.HPT	1/24/2020
NRS053.HPT	1/23/2020
NRS054.HPT	1/23/2020
NRS055.HPT	1/23/2020
NRS056.HPT	1/22/2020



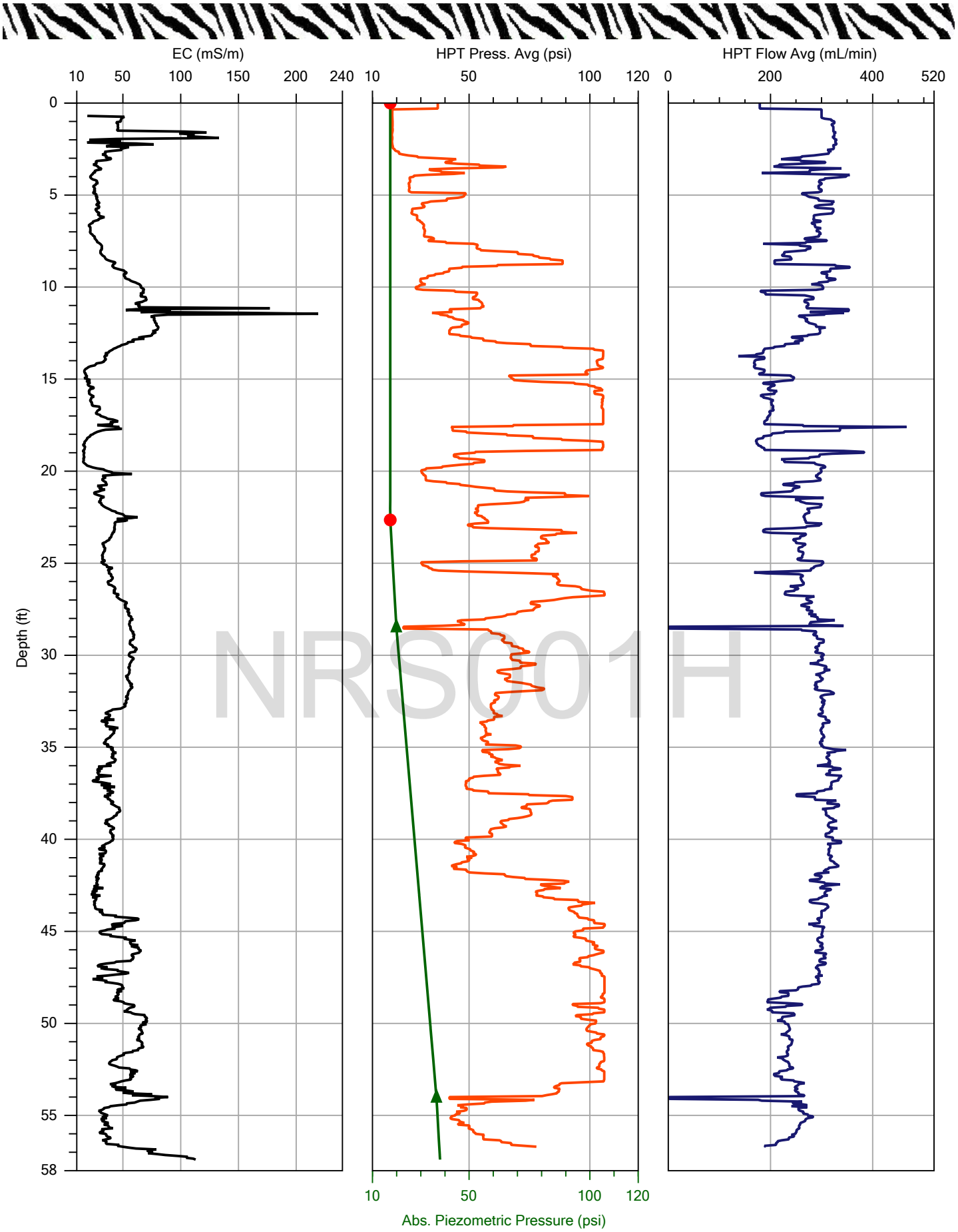
AECOM

EC / Relative Perm (mL/min/Corr HPT Press (psi)

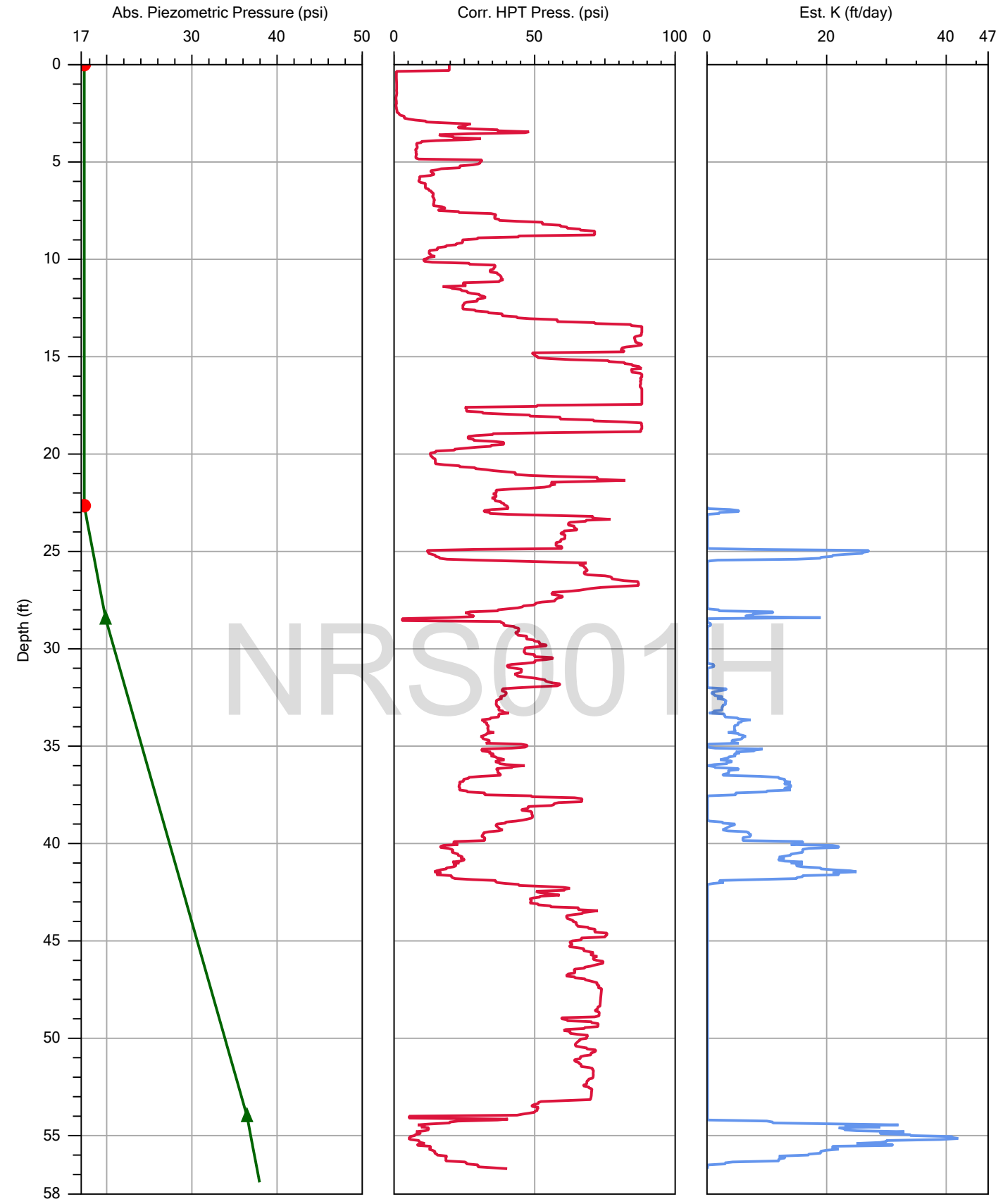
Company: AECOM	Operator: D. Ferrell (CASCADE DRILLING)
Project ID: 60621225	Client: TVA

NRS052.HPT	1/24/2020
NRS053.HPT	1/23/2020
NRS054.HPT	1/23/2020
NRS055.HPT	1/23/2020
NRS056.HPT	1/22/2020

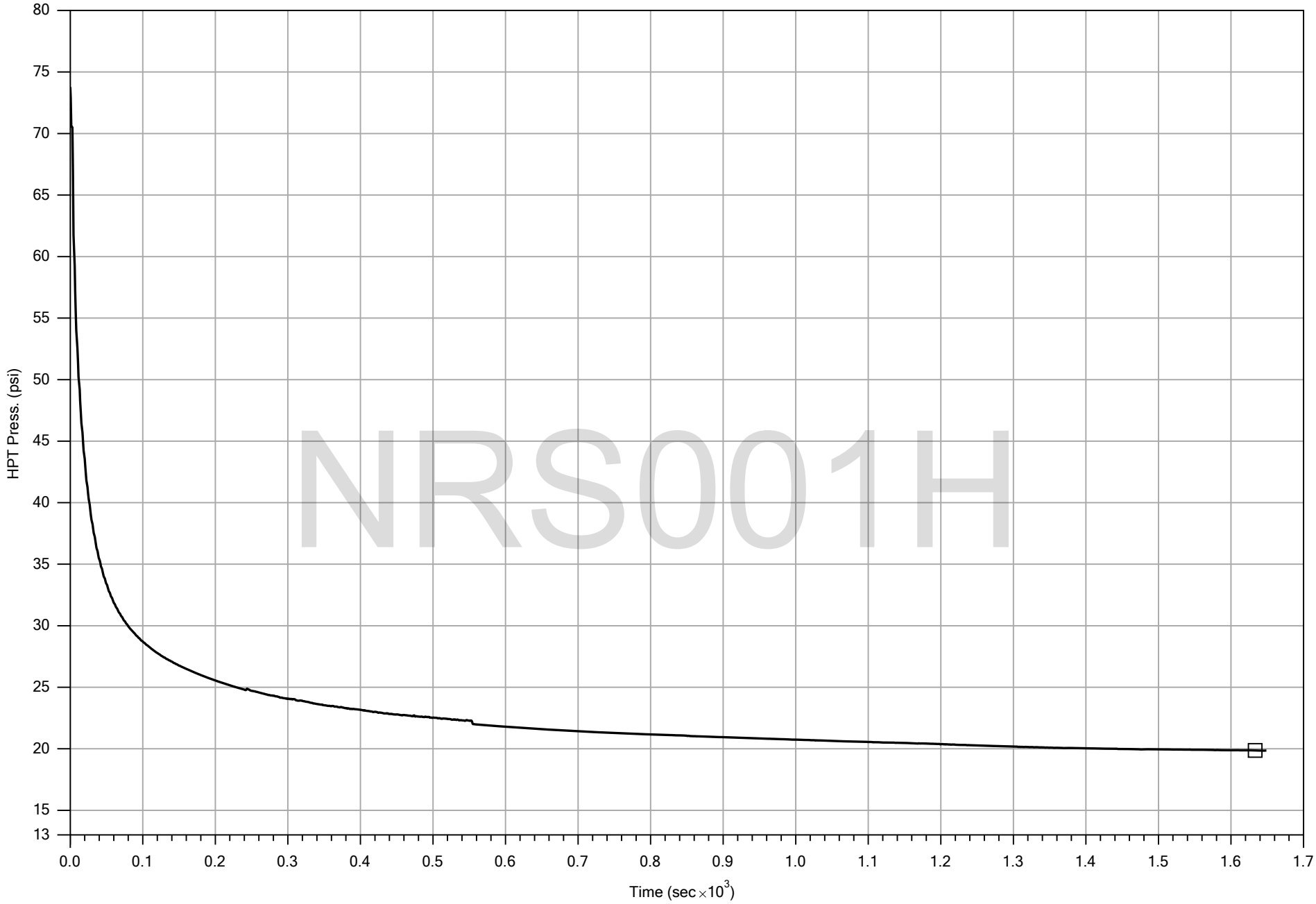
NRS 2015 Field Investigation HPT Profiles



		File: NRS001H.DAT
Company: ZTS	Operator: RR	Date: 6/17/2015
Project ID: TVA	Client: AECOM	Location:



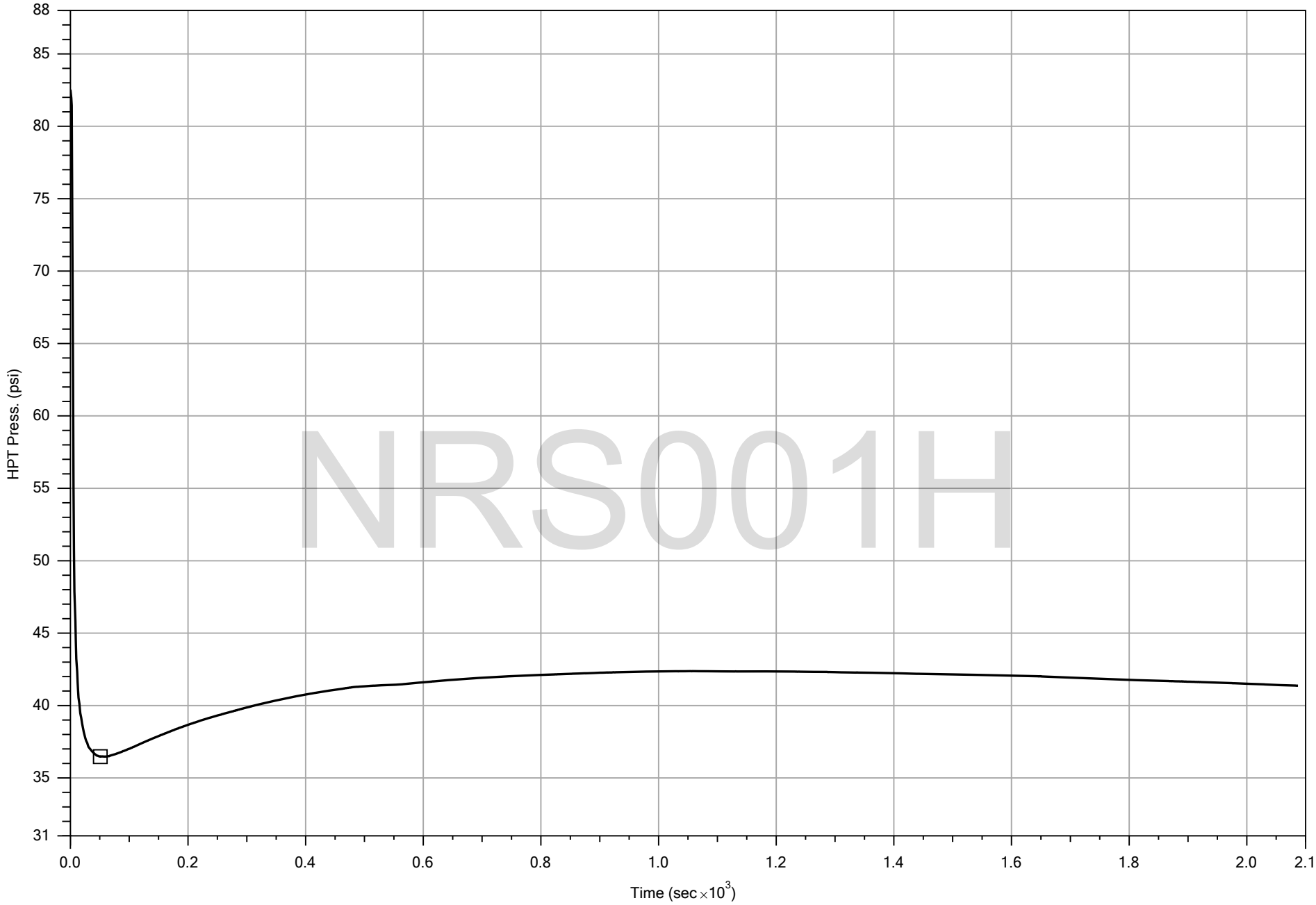
			File: NRS001H.DAT
Company: ZTS	Operator: RR		Date: 6/17/2015
Project ID: TVA	Client: AECOM		Location:



ZEBRA

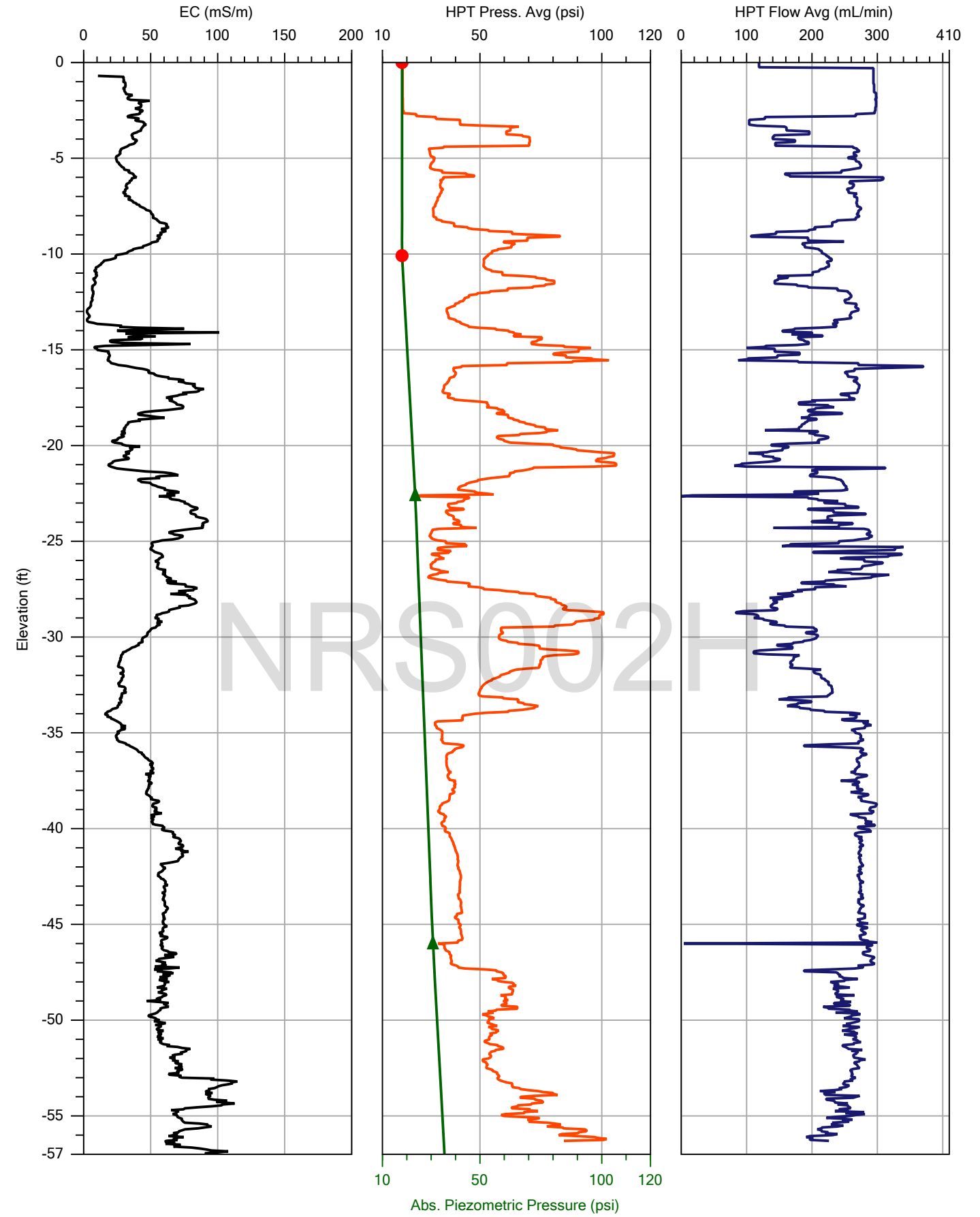
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS001H.DIS	Date: 6/17/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 28.45 ft	Test: 1

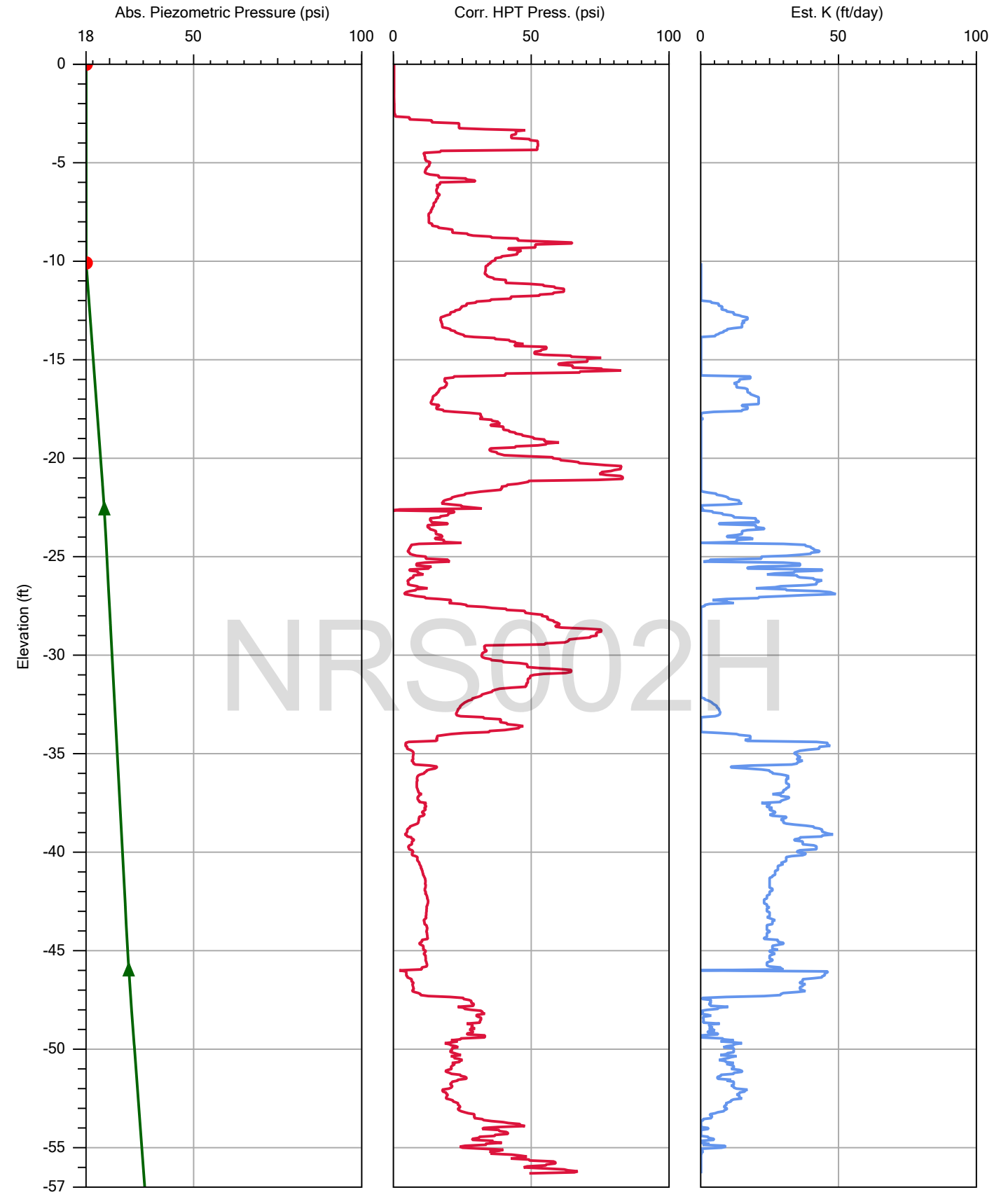


HPT DISSIPATION (SINGLE CASE)

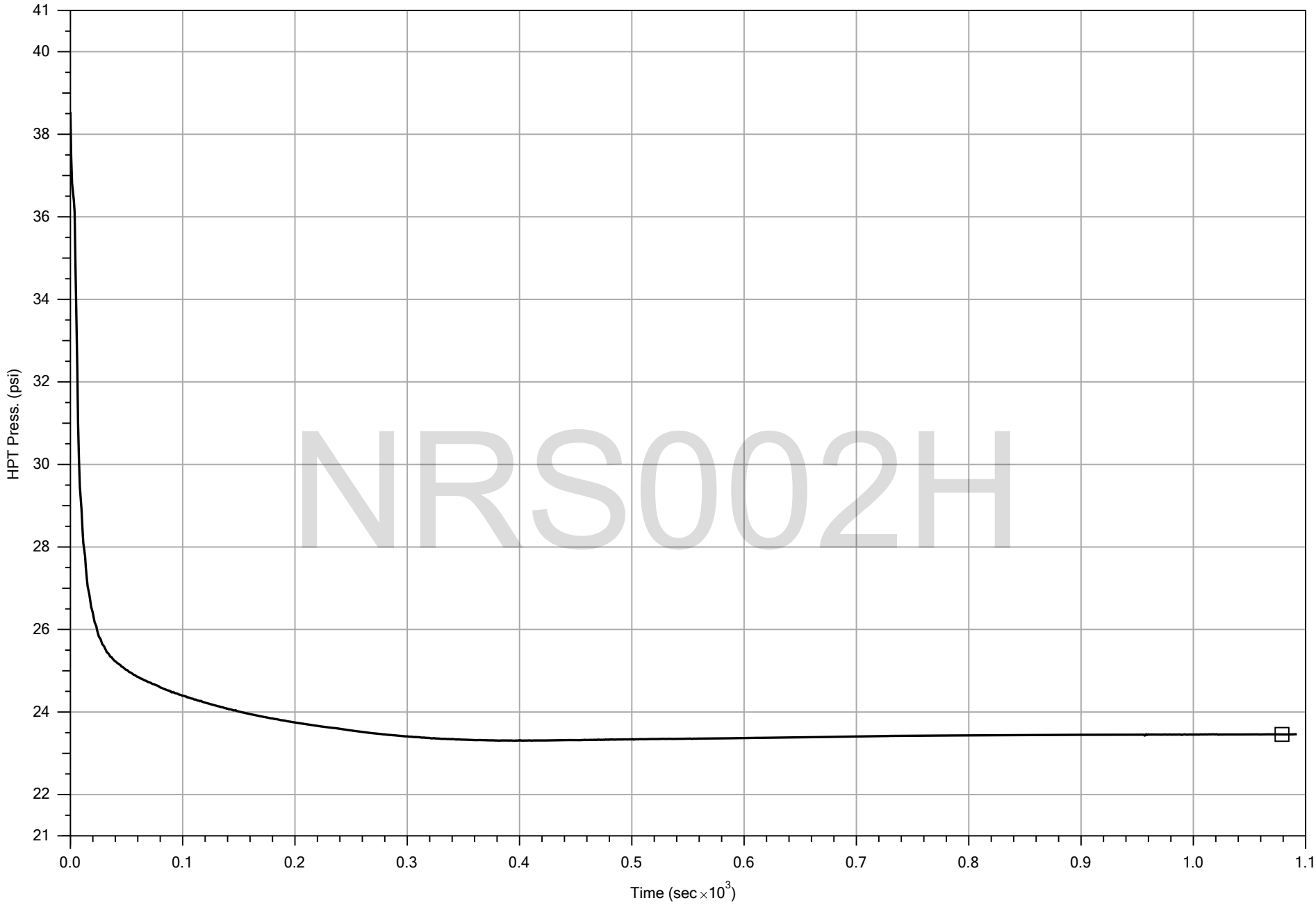
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 54.00 ft	Test: 1
File: NRS001H.DIS			Date: 6/17/2015



			File: NRS002H.DAT
Company: ZTS	Operator: RR		Date: 6/16/2015
Project ID: TVA	Client: AECOM		Location:

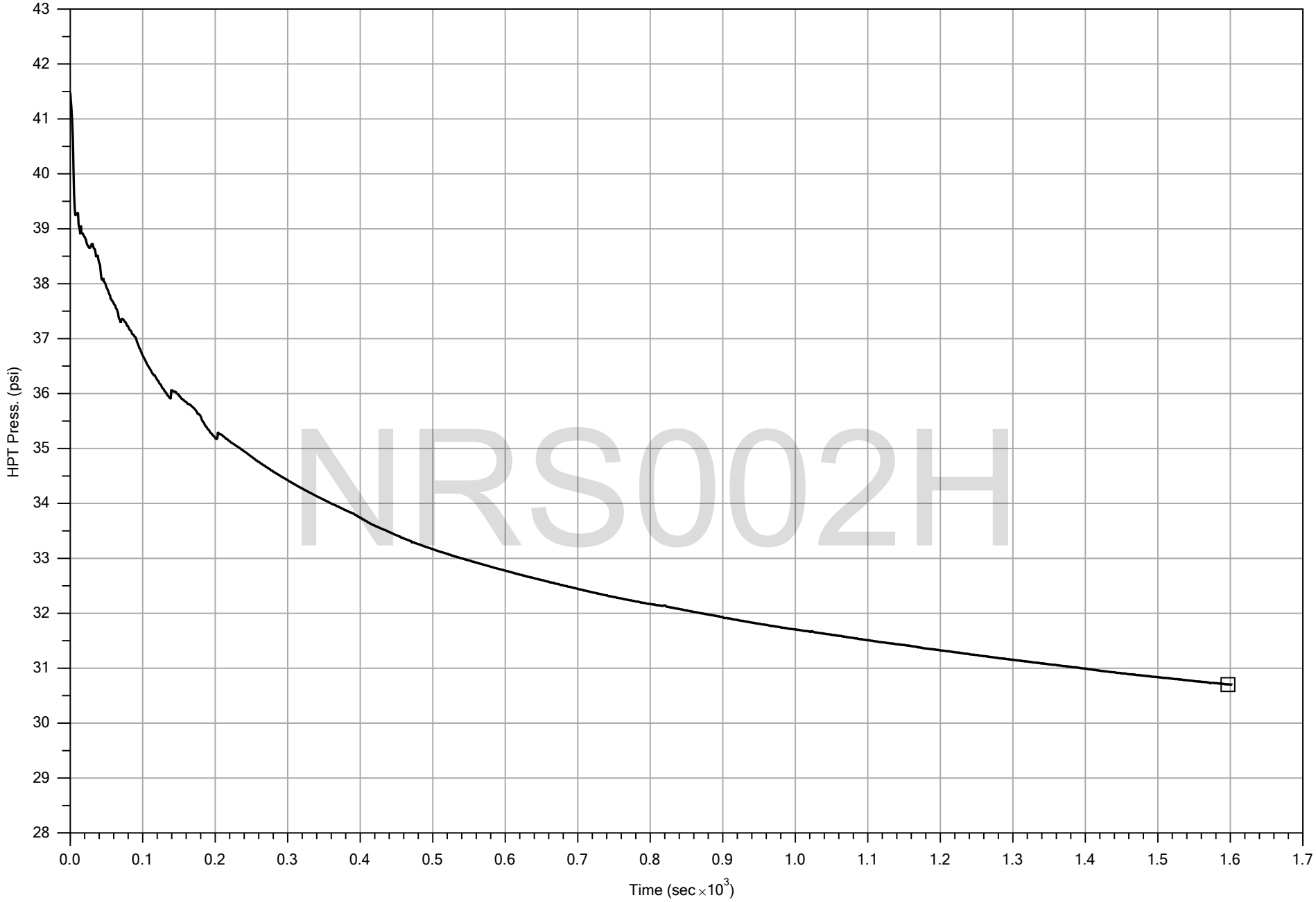


			File: NRS002H.DAT
Company: ZTS	Operator: RR		Date: 6/16/2015
Project ID: TVA	Client: AECOM		Location:



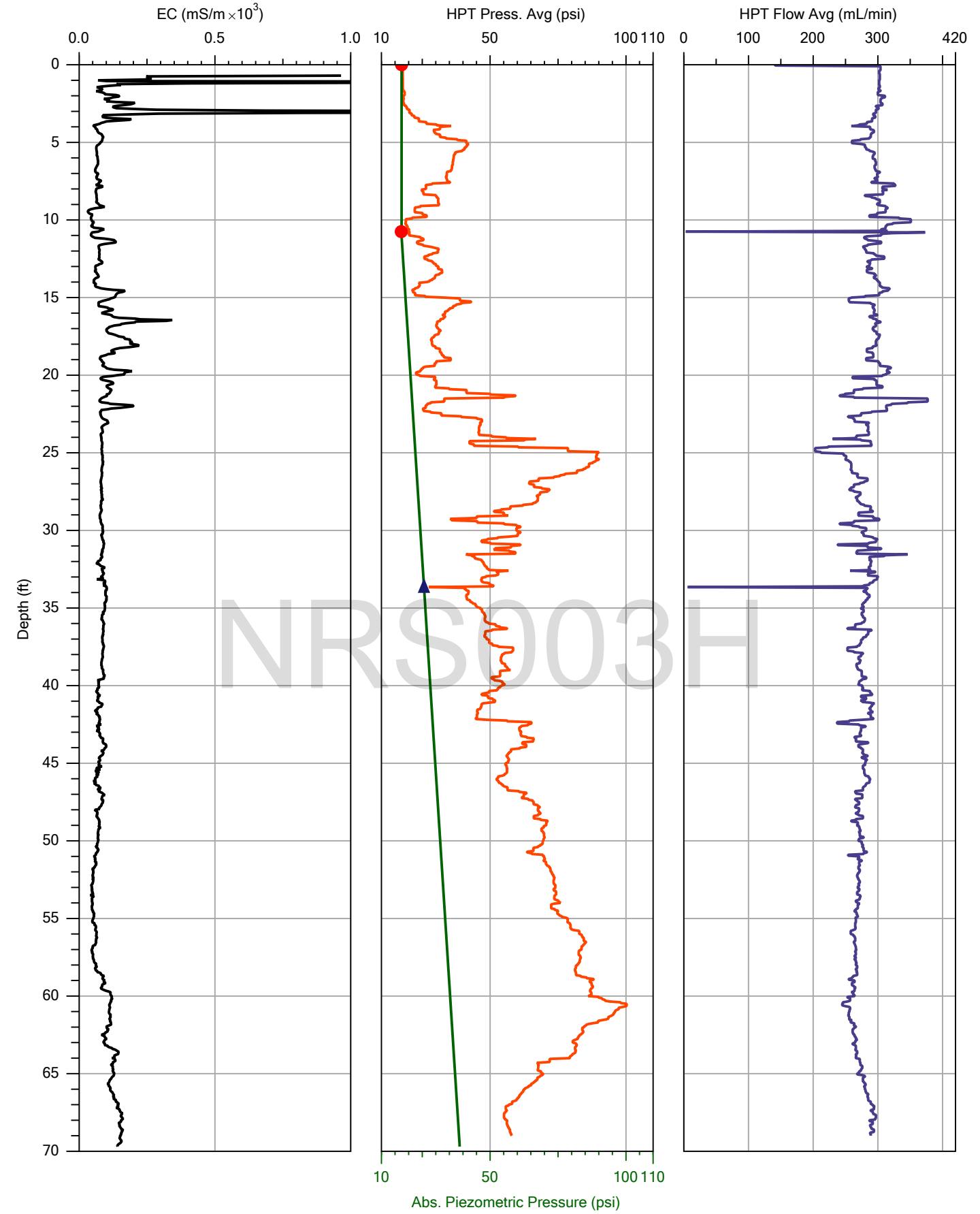
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 22.60 ft	Test: 1
File: NRS002H.DIS			Date: 6/16/2015

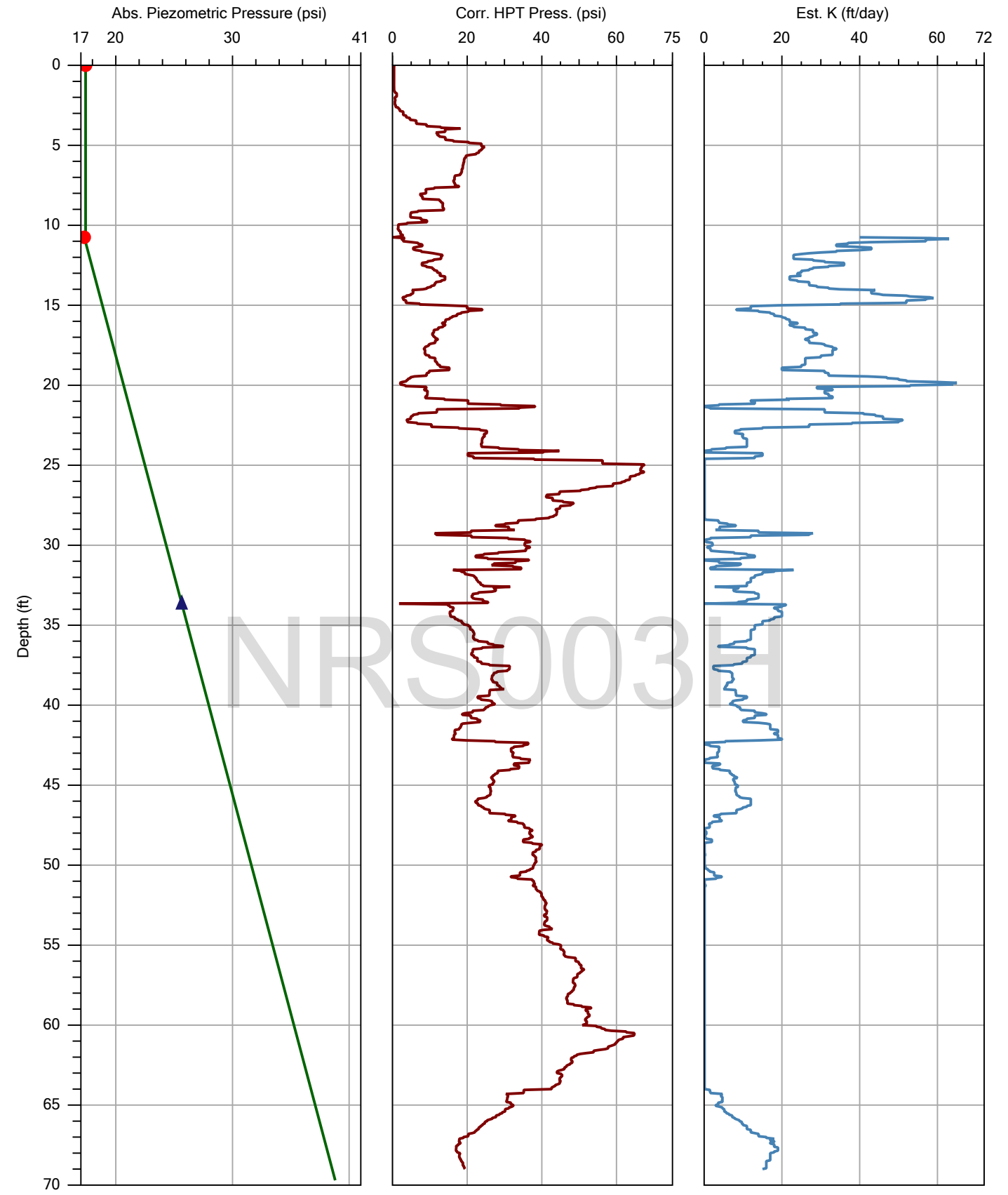


HPT DISSIPATION (SINGLE CASE)

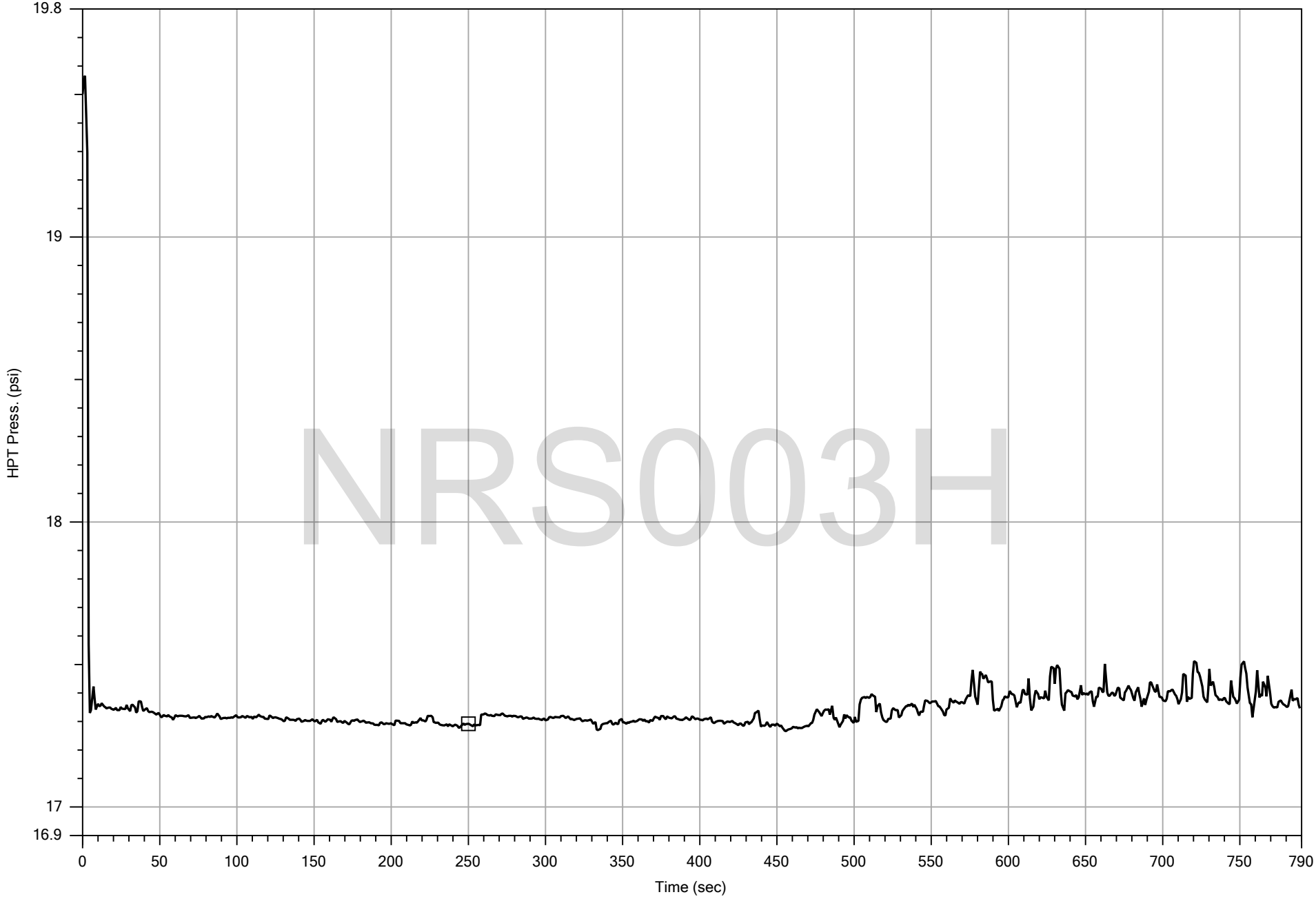
Company: ZTS	Operator: RR	File: NRS002H.DIS	Date: 6/16/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 46.00 ft	Test: 1



			File: NRS003H.DAT
Company: ZEBRA		Operator: RR	Date: 6/22/2015
Project ID: TVA		Client: AECOM	Location:

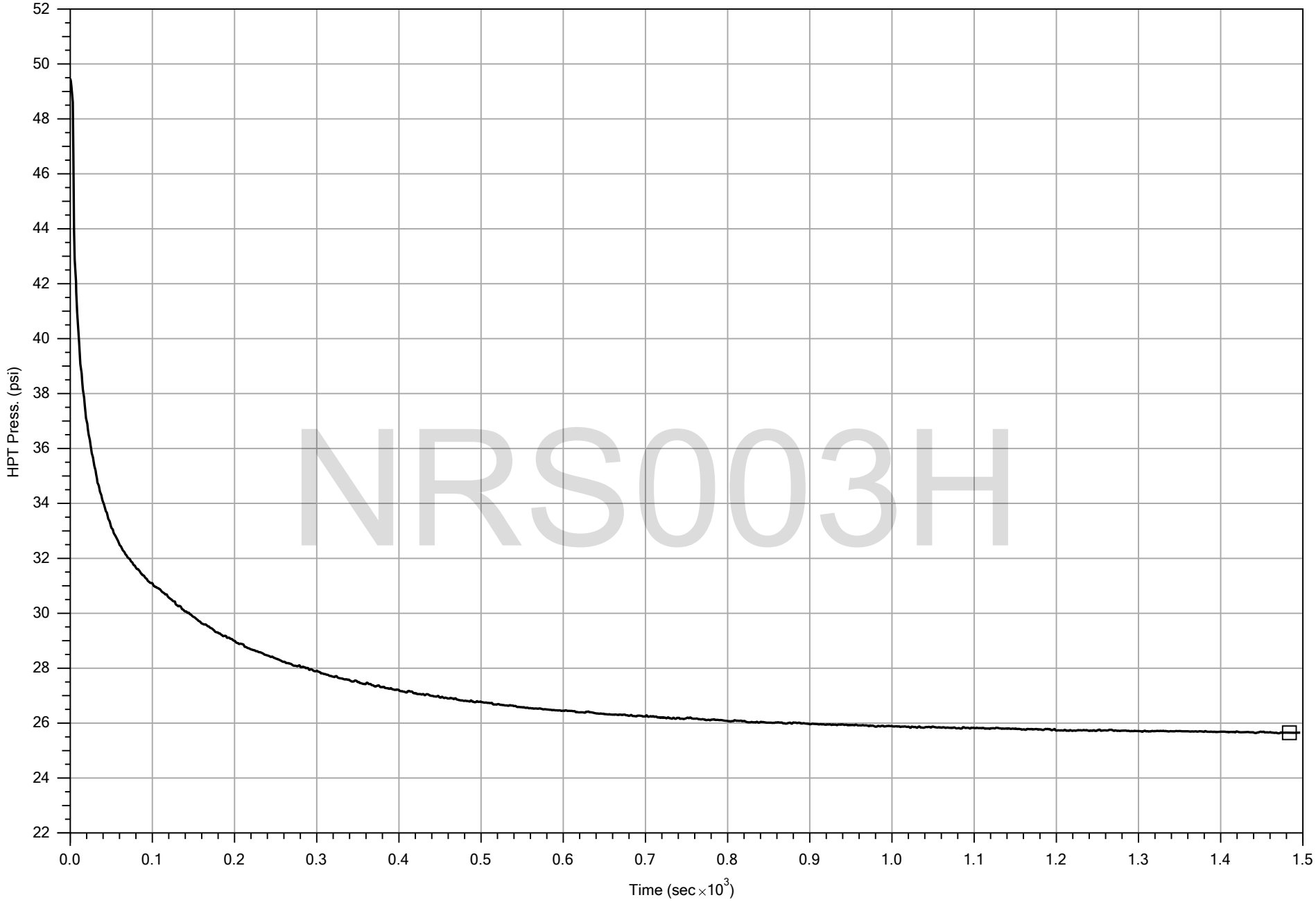


			File: NRS003H.DAT
Company: ZEBRA	Operator: RR		Date: 6/22/2015
Project ID: TVA	Client: AECOM		Location:



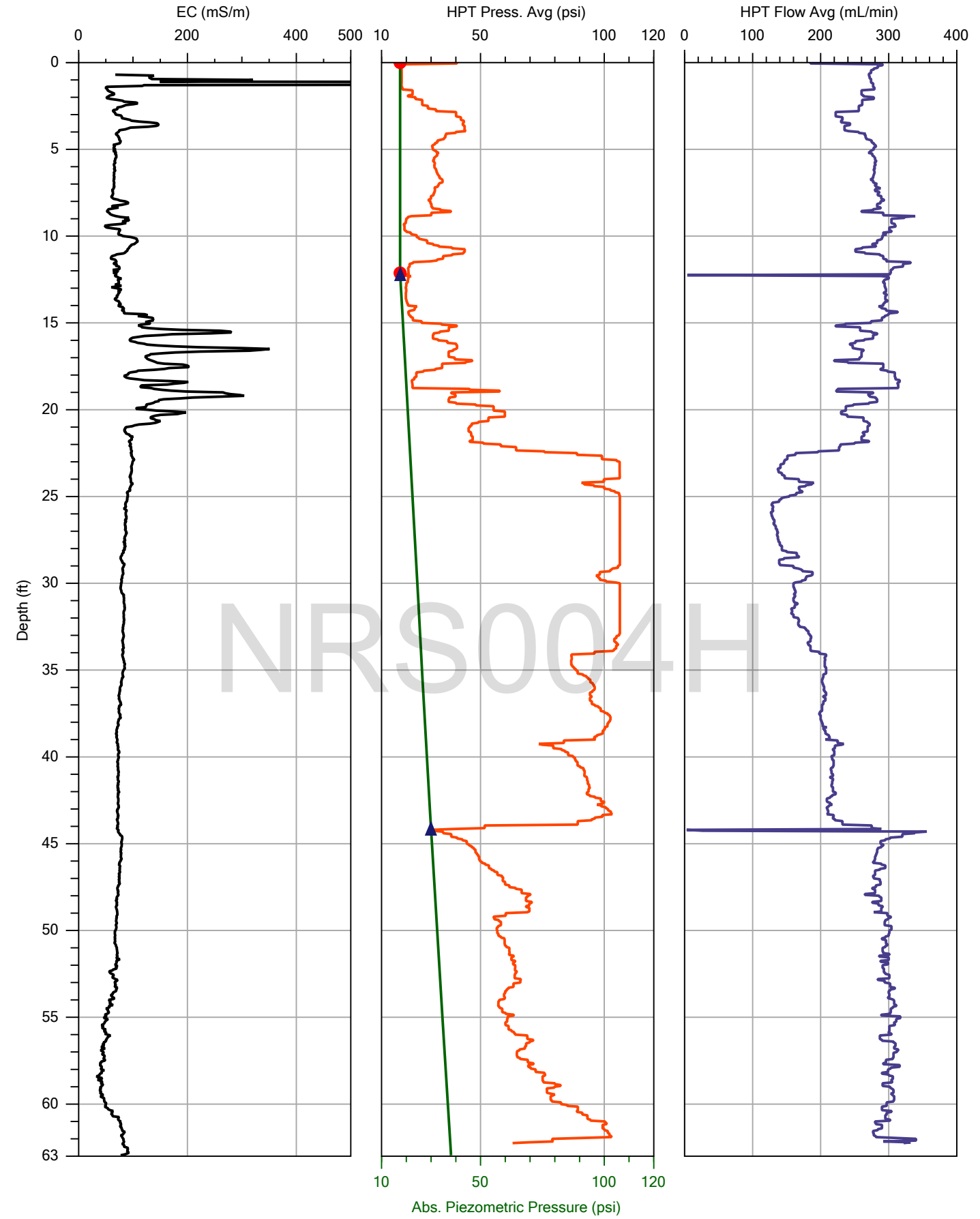
HPT DISSIPATION (SINGLE CASE)

Company: ZEBRA	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 10.75 ft	Test: 1
File: NRS003H.DIS			Date: 6/22/2015

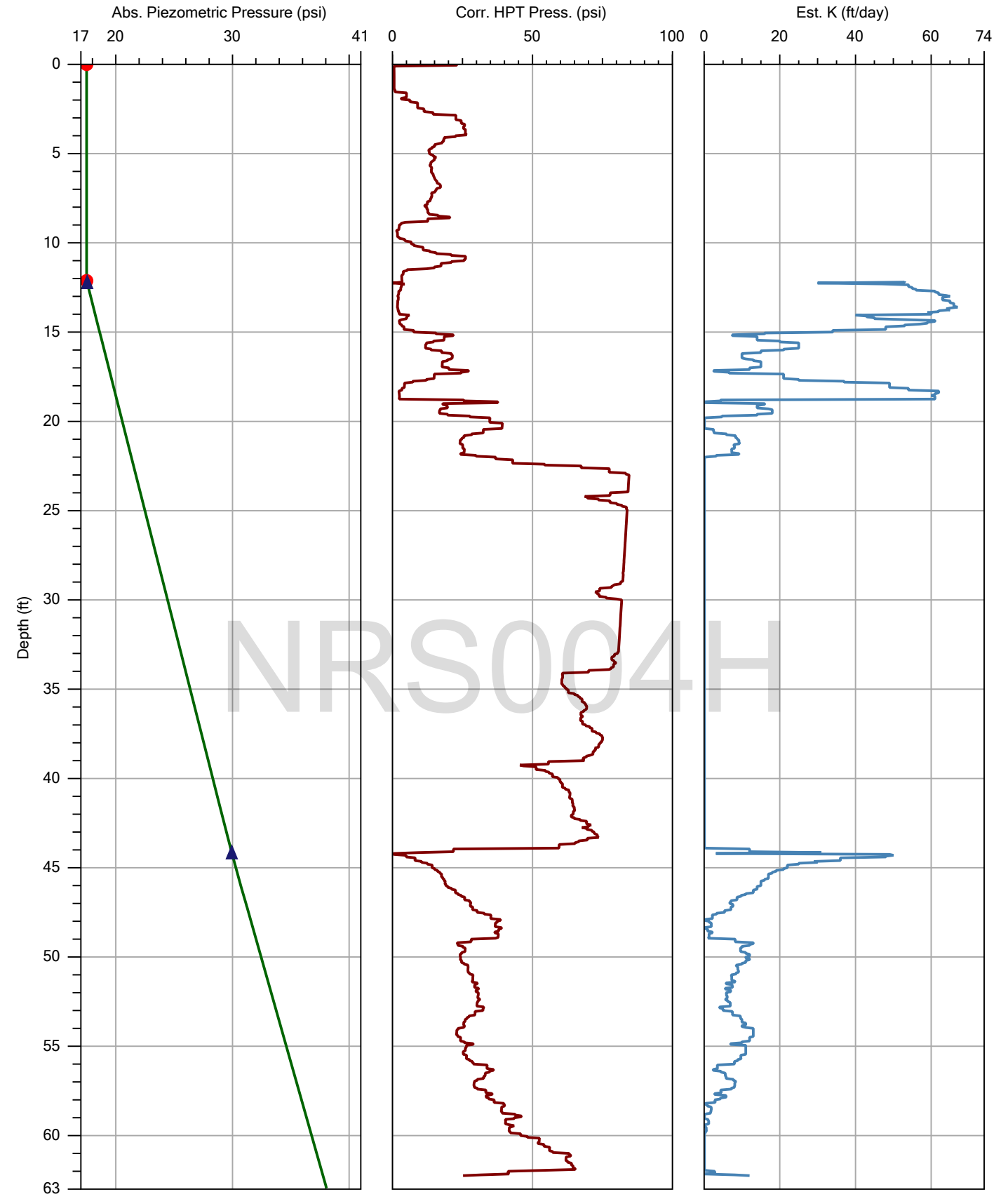


HPT DISSIPATION (SINGLE CASE)

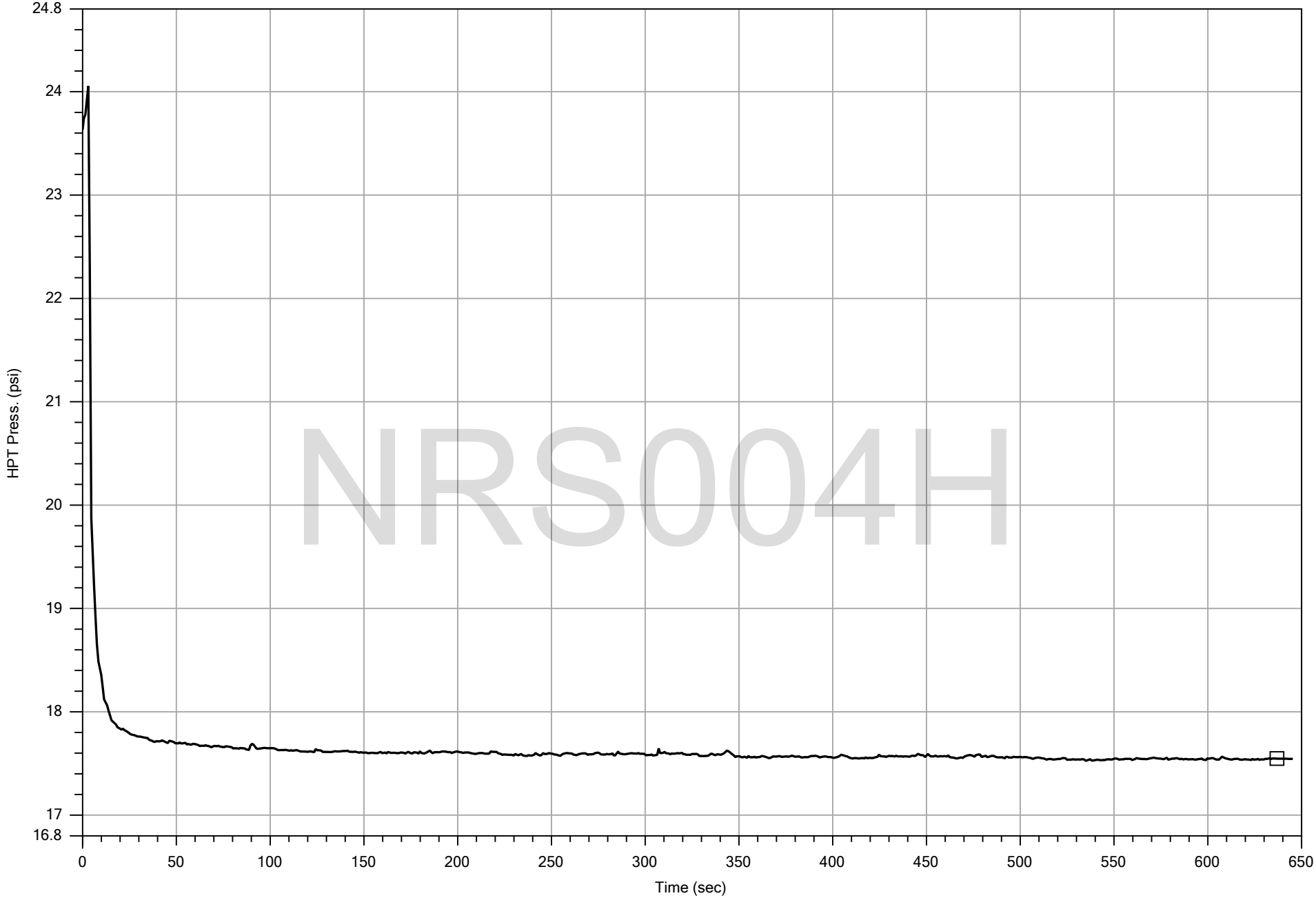
Company: ZEBRA	Operator: RR	File: NRS003H.DIS	Date: 6/22/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 33.65 ft	Test: 1



			File: NRS004H.DAT
Company: ZEBRA	Operator: RR		Date: 6/22/2015
Project ID: TVA	Client: AECOM		Location:

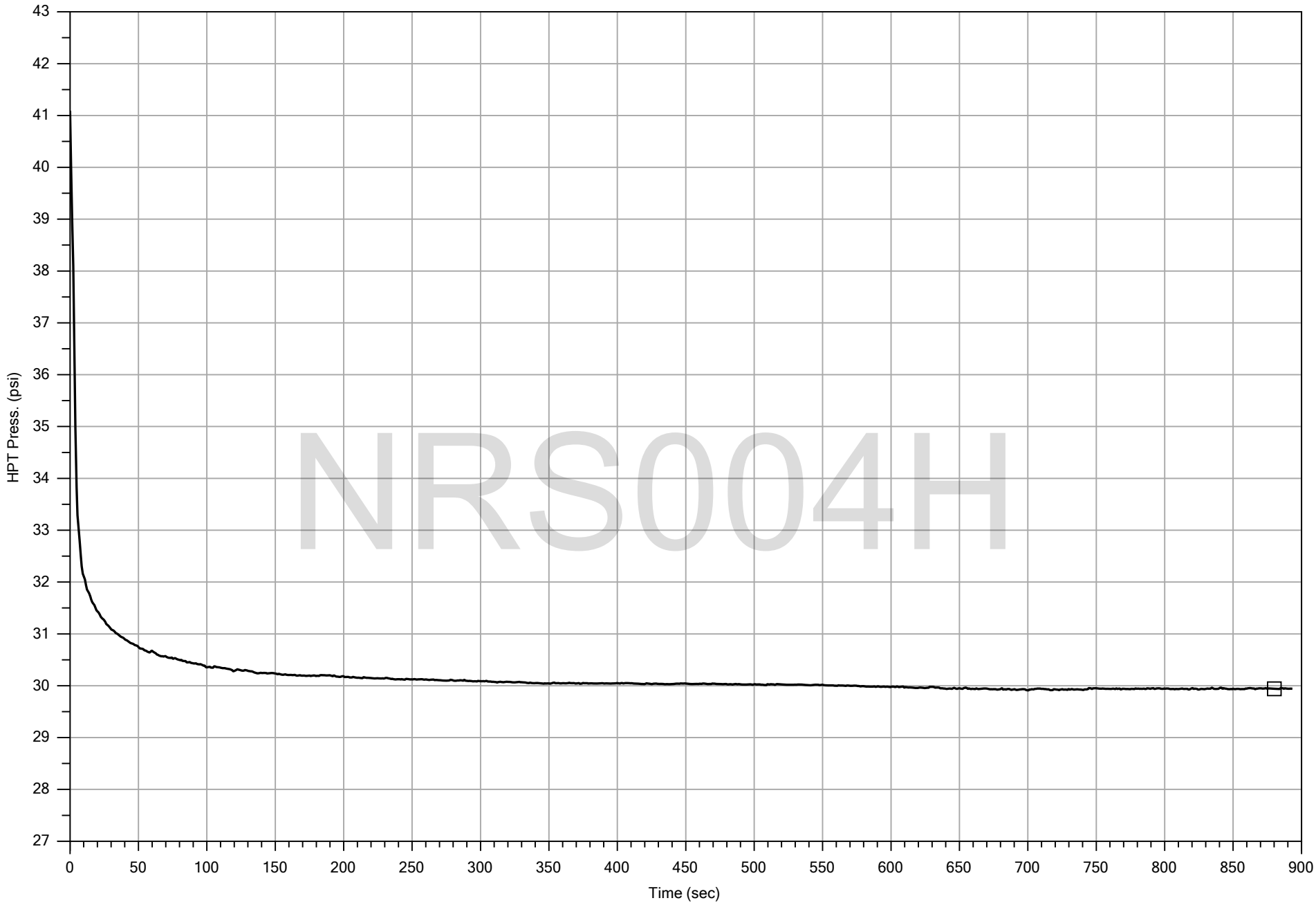


			File: NRS004H.DAT
Company: ZEBRA	Operator: RR		Date: 6/22/2015
Project ID: TVA	Client: AECOM		Location:



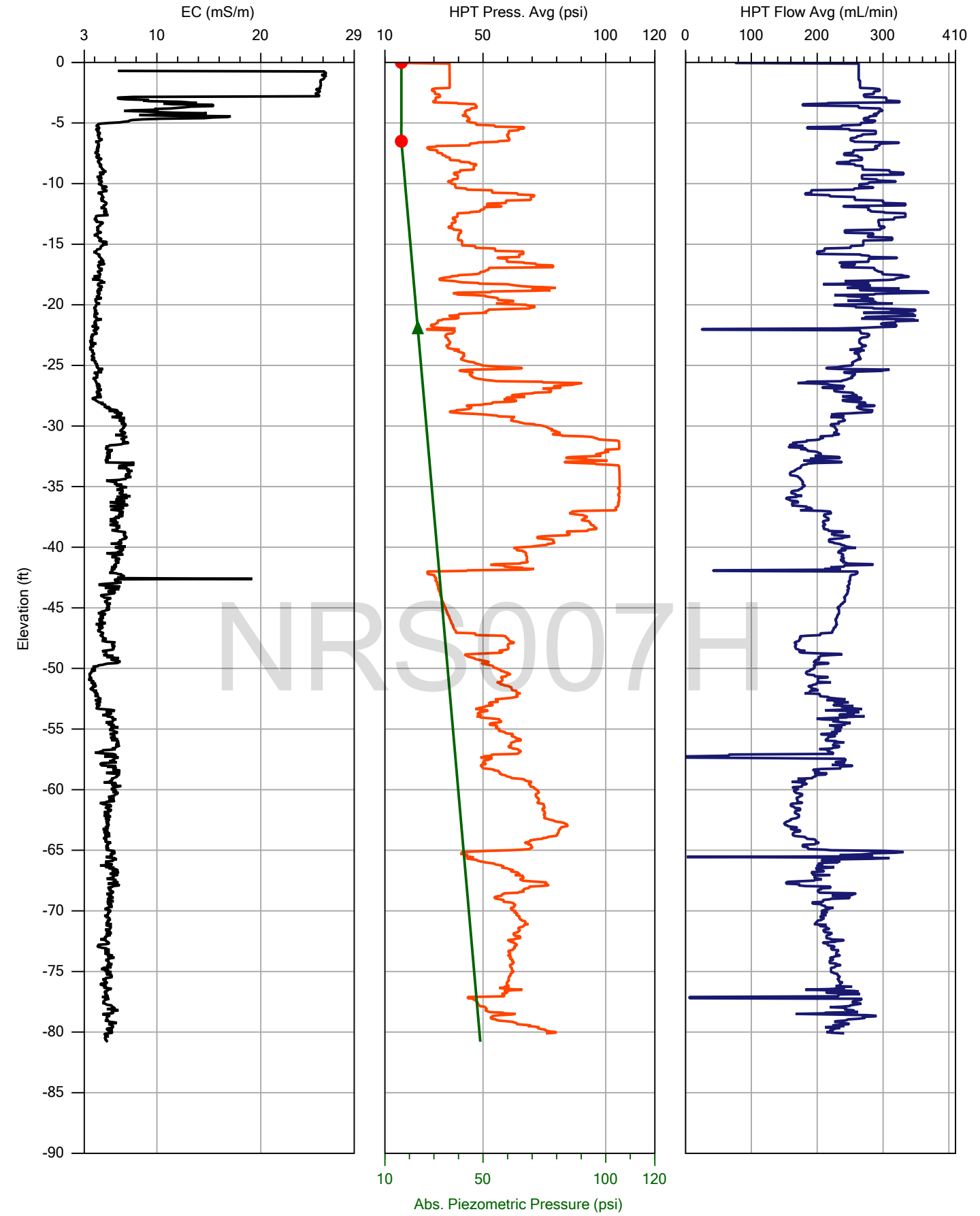
HPT DISSIPATION (SINGLE CASE)

Company: ZEBRA	Operator: RR	File: NRS004H.DIS	Date: 6/22/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 12.25 ft	Test: 1

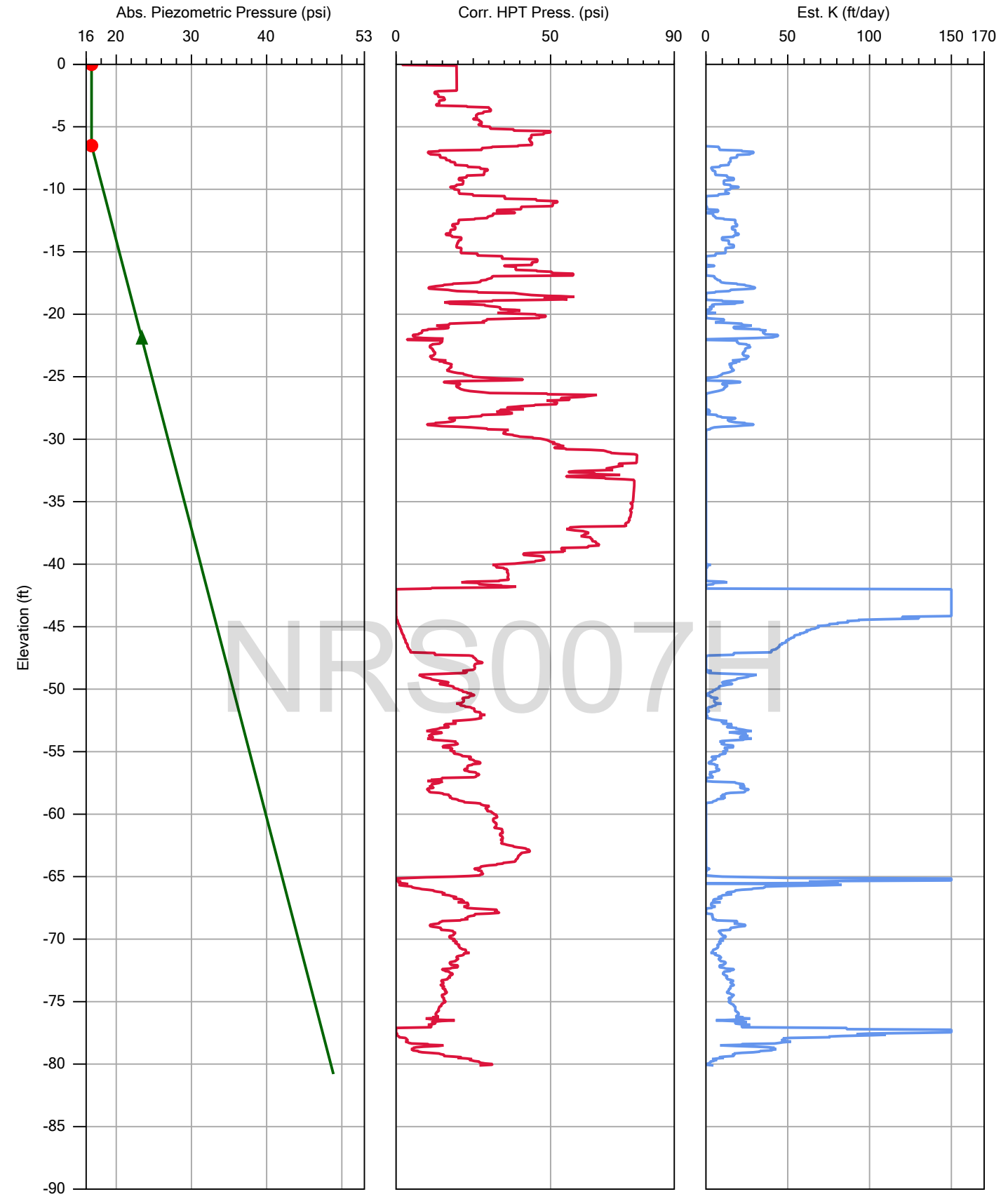


HPT DISSIPATION (SINGLE CASE)

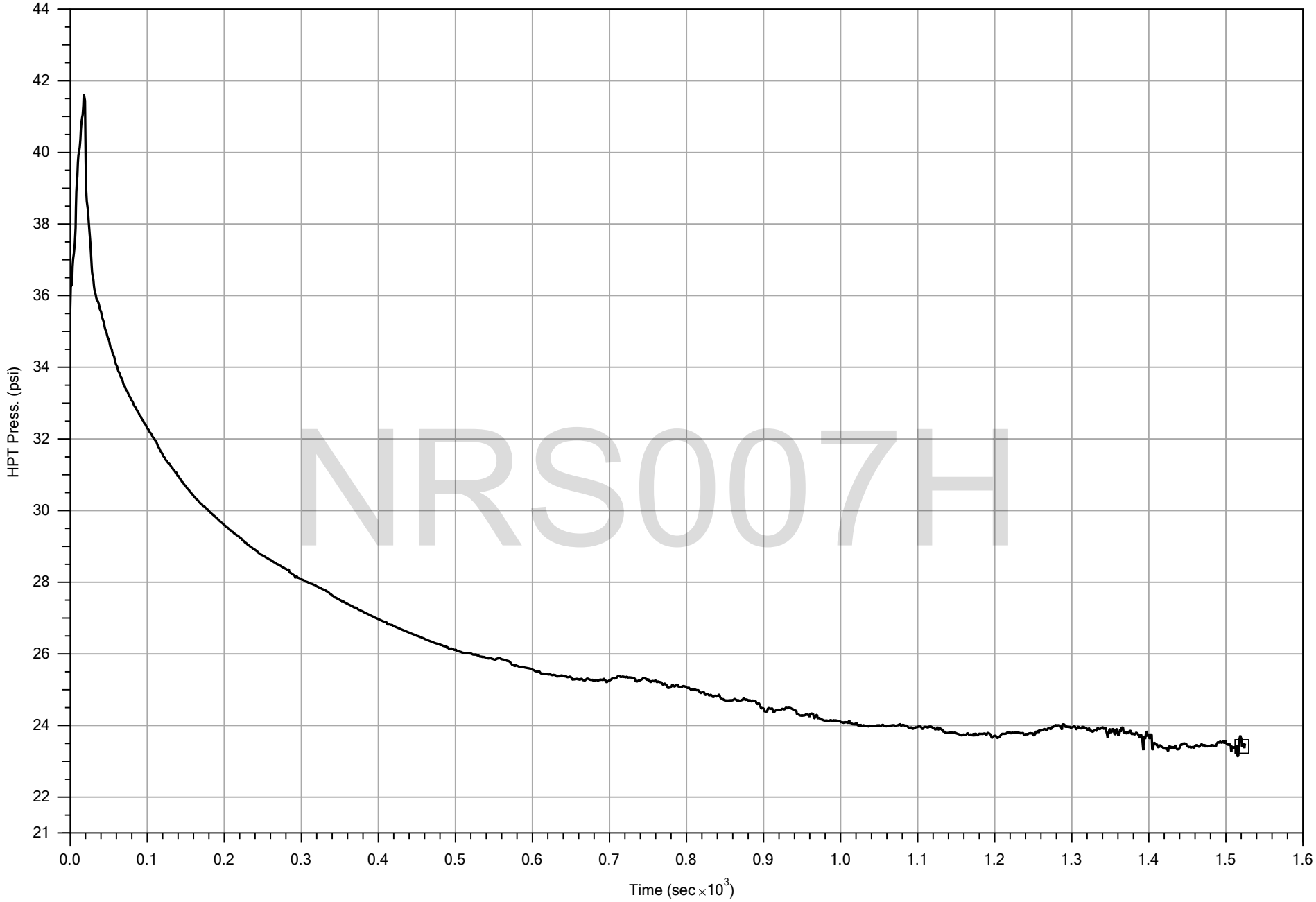
Company: ZEBRA	Operator: RR	File: NRS004H.DIS	Date: 6/22/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 44.20 ft	Test: 1



			File: NRS007H.DAT
Company: ZTS	Operator: RR		Date: 6/15/2015
Project ID: TVA	Client: AECOM		Location:



			File: NRS007H.DAT
Company: ZTS	Operator: RR		Date: 6/15/2015
Project ID: TVA	Client: AECOM		Location:



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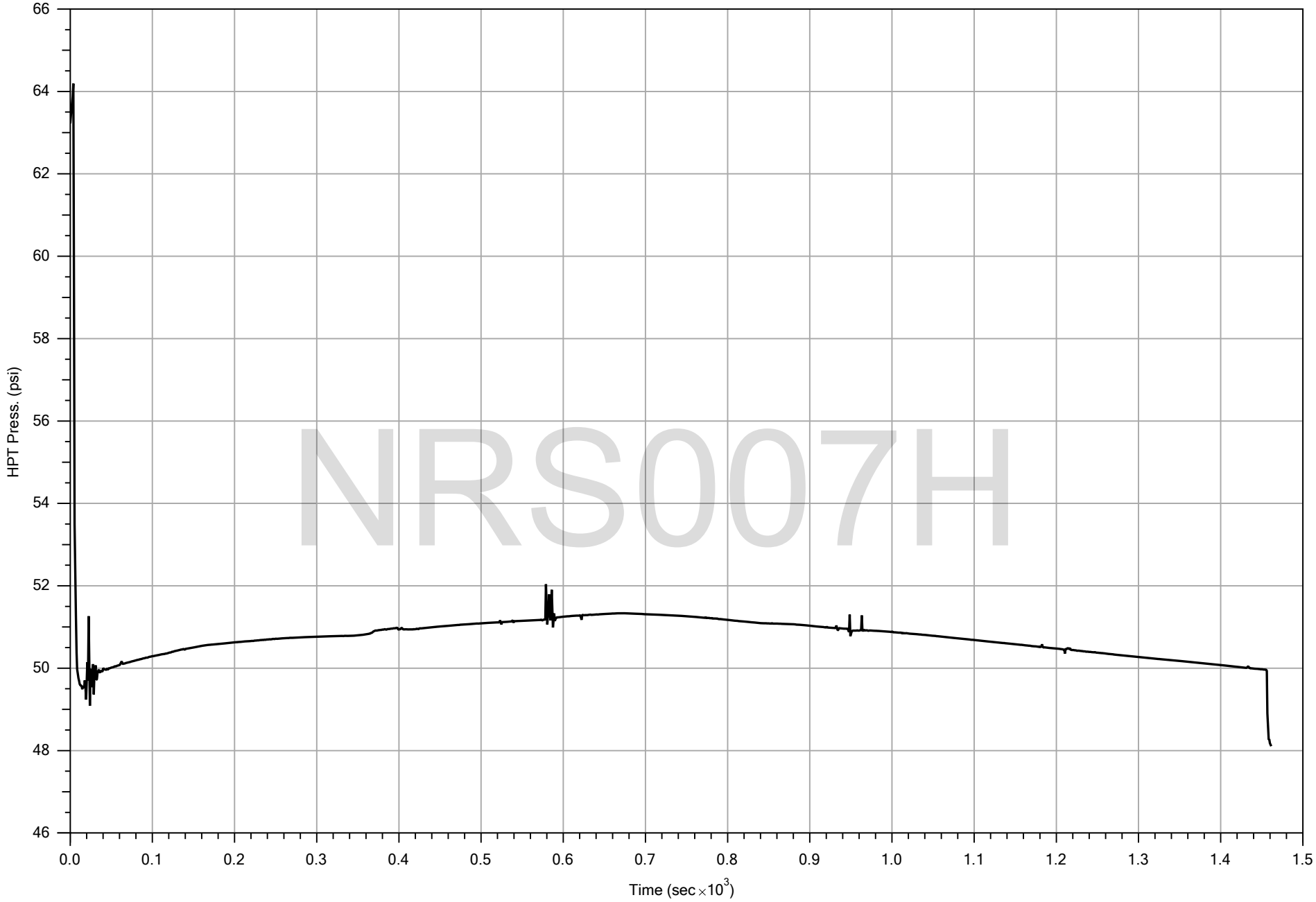
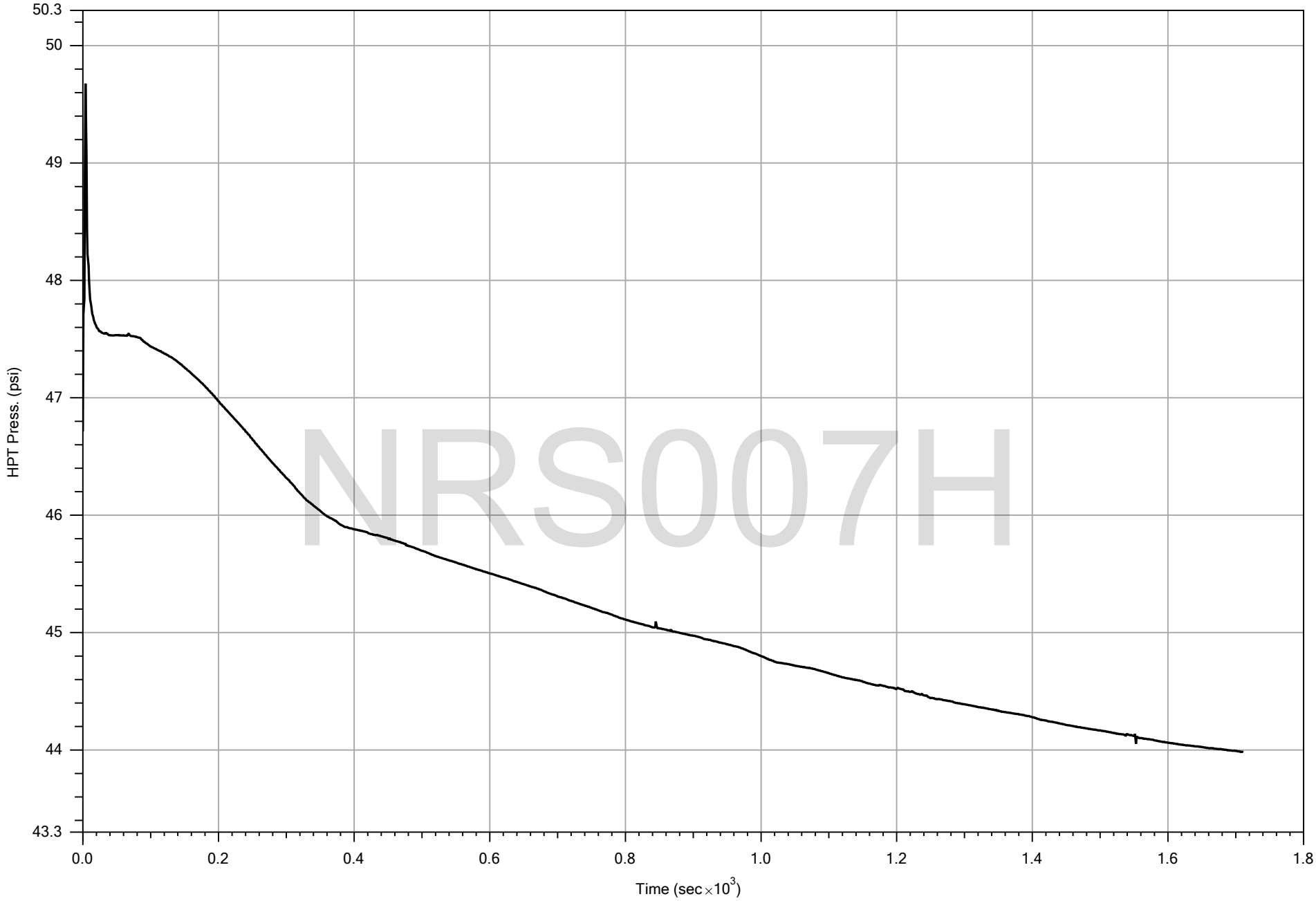
HPT DISSIPATION (SINGLE CASE)

File: NRS007H.DIS			Date: 6/15/2015
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 21.95 ft	Test: 1



HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS007H.DIS	Date: 6/15/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 57.10 ft	Test: 1



HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS007H.DIS	Date: 6/15/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 65.55 ft	Test: 1

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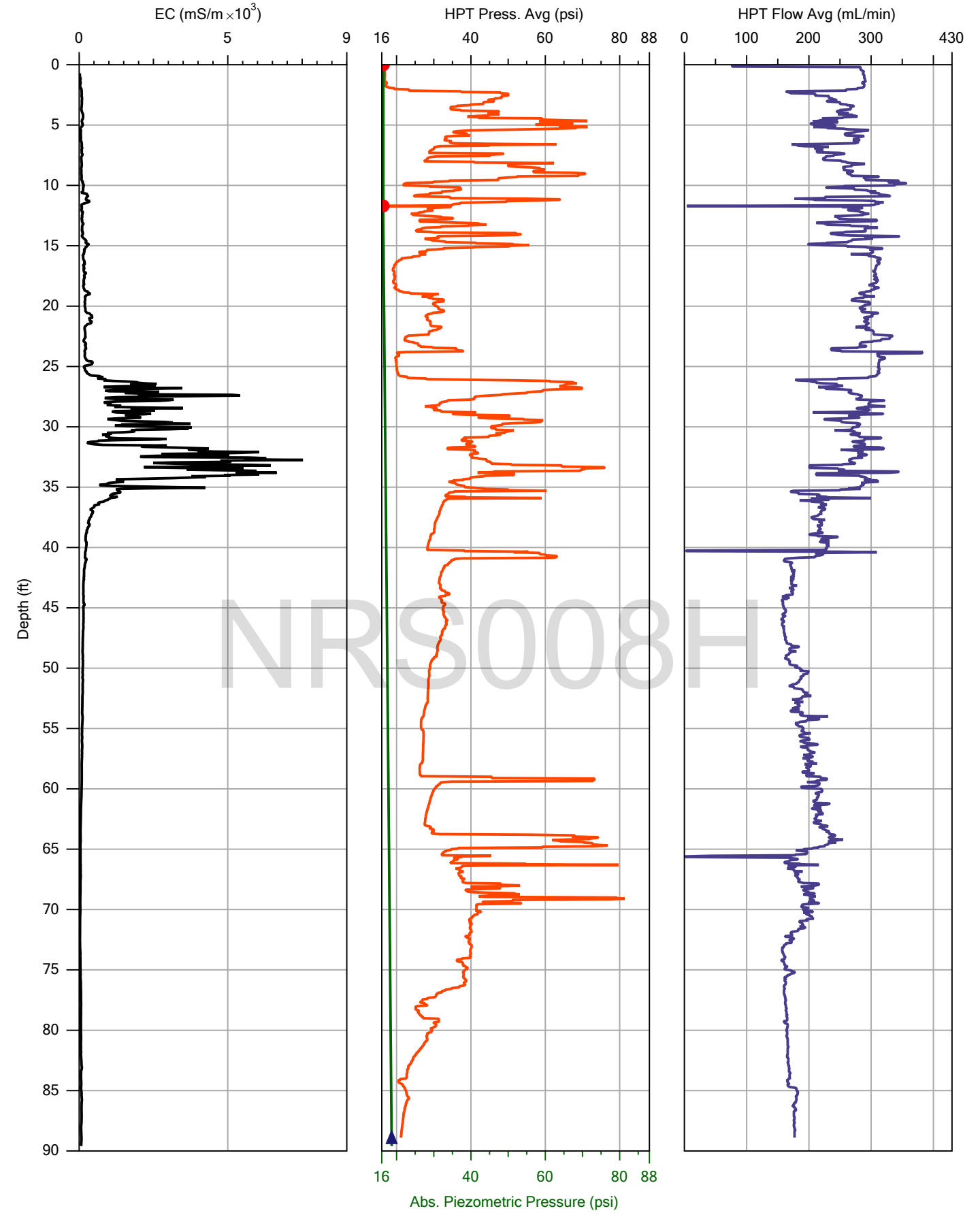
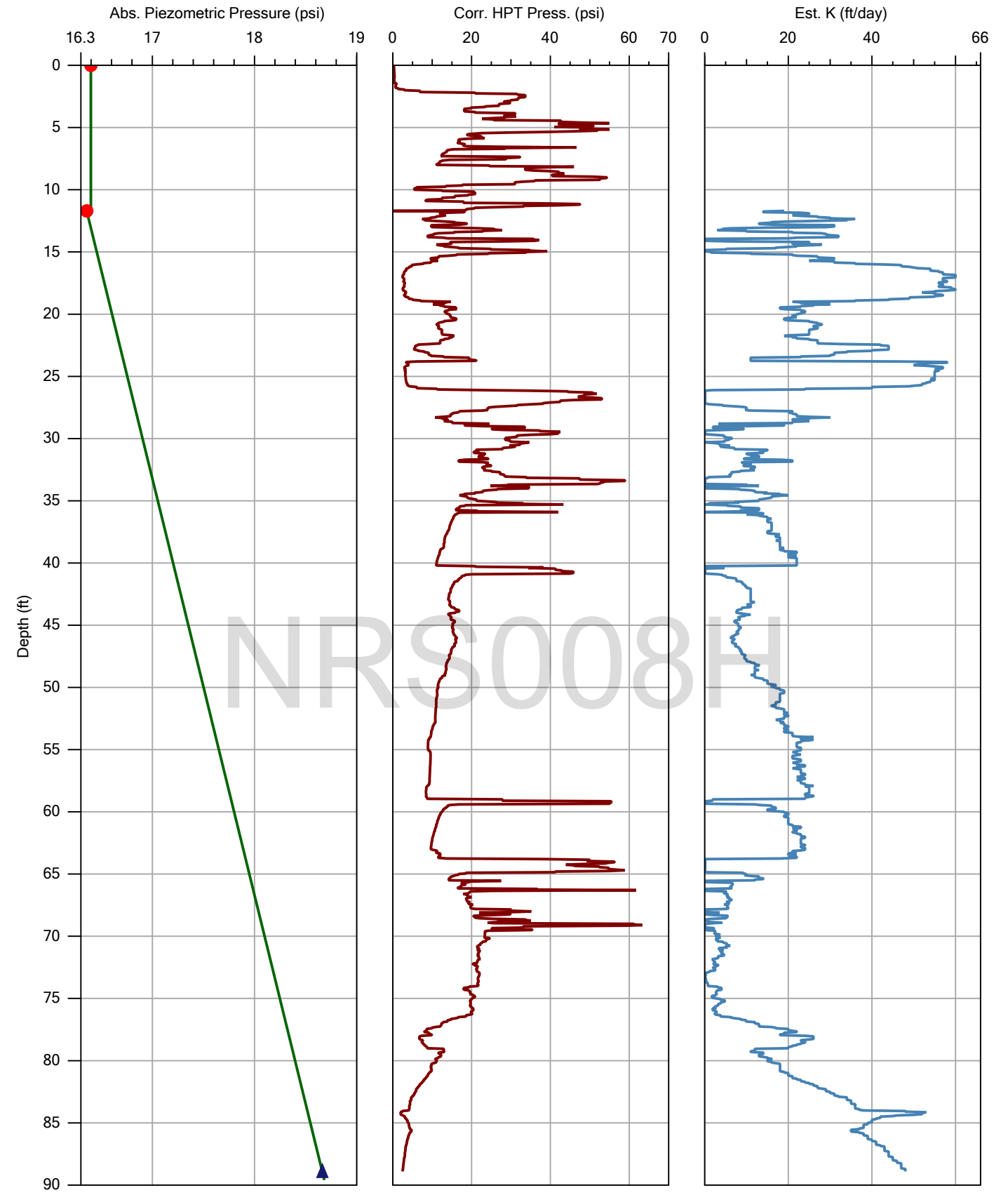
HPT DISSIPATION (SINGLE CASE)

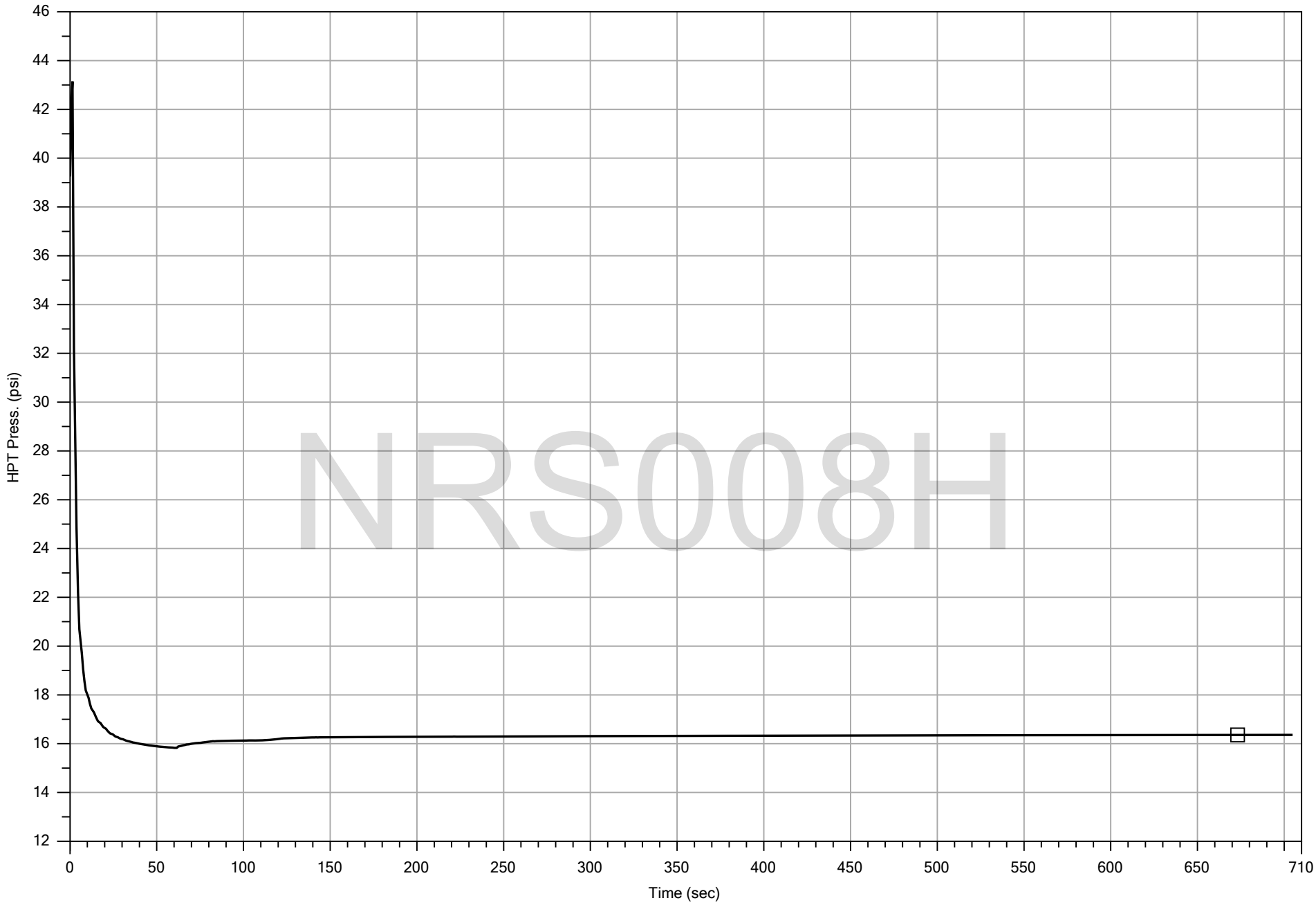
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 77.10 ft	Test: 1
File: NRS007H.DIS			Date: 6/15/2015



			File: NRS008H.DAT
Company: ZTS	Operator: RR		Date: 6/27/2015
Project ID: TVA	Client: AECOM		Location:



			File: NRS008H.DAT
Company: ZTS	Operator: RR		Date: 6/27/2015
Project ID: TVA	Client: AECOM		Location:



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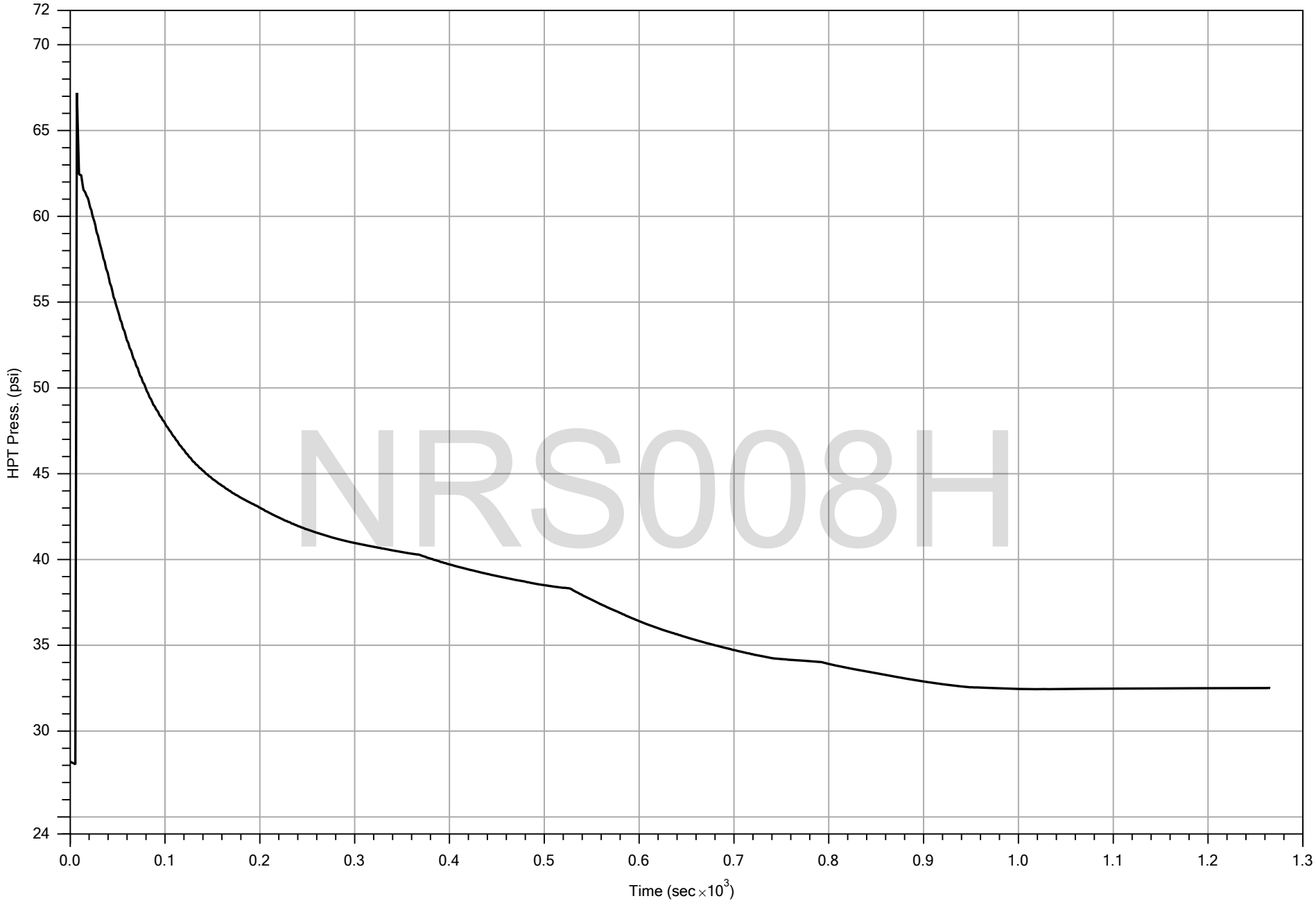
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS008H.DIS	Date: 6/27/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 11.70 ft	Test: 1



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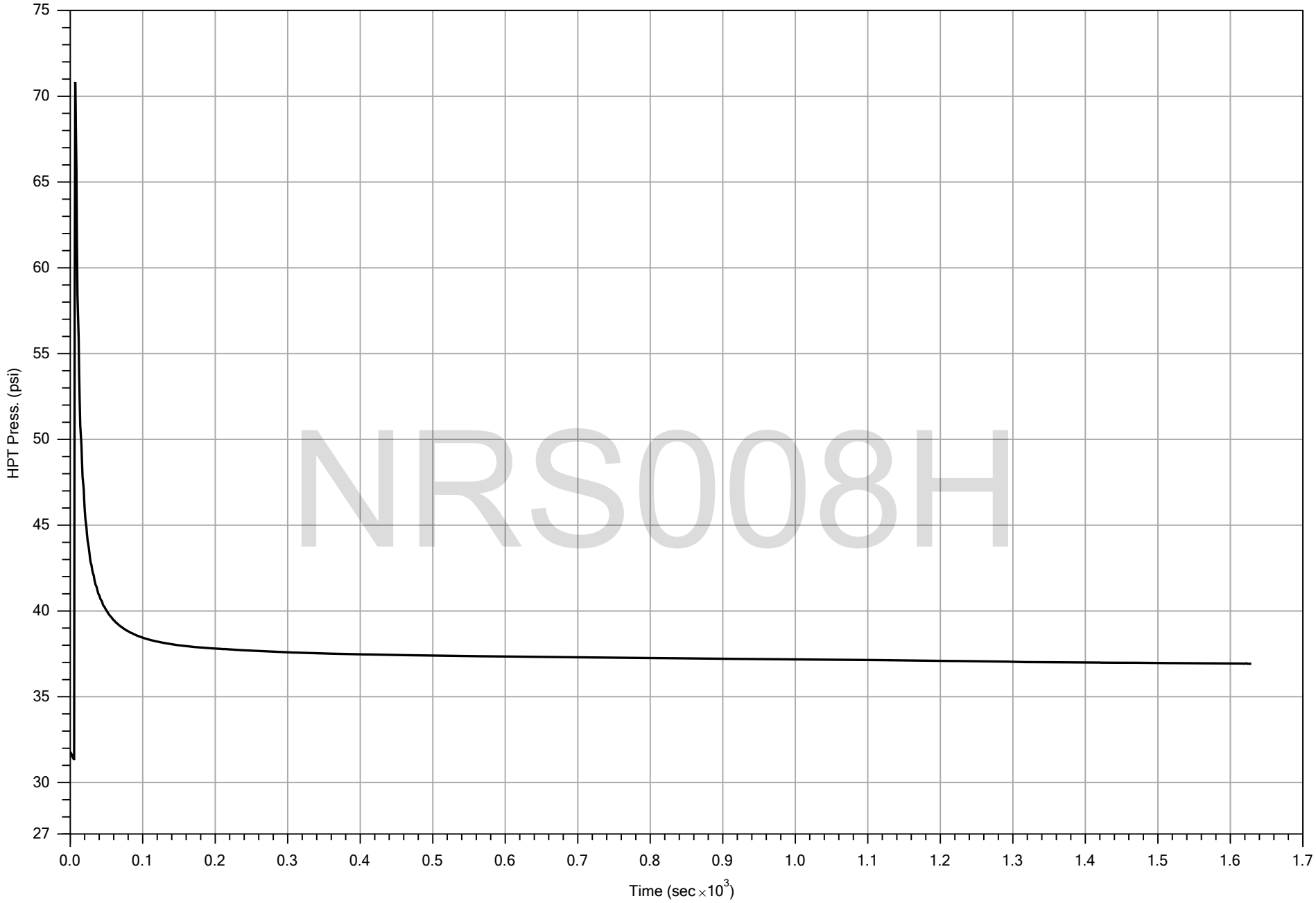
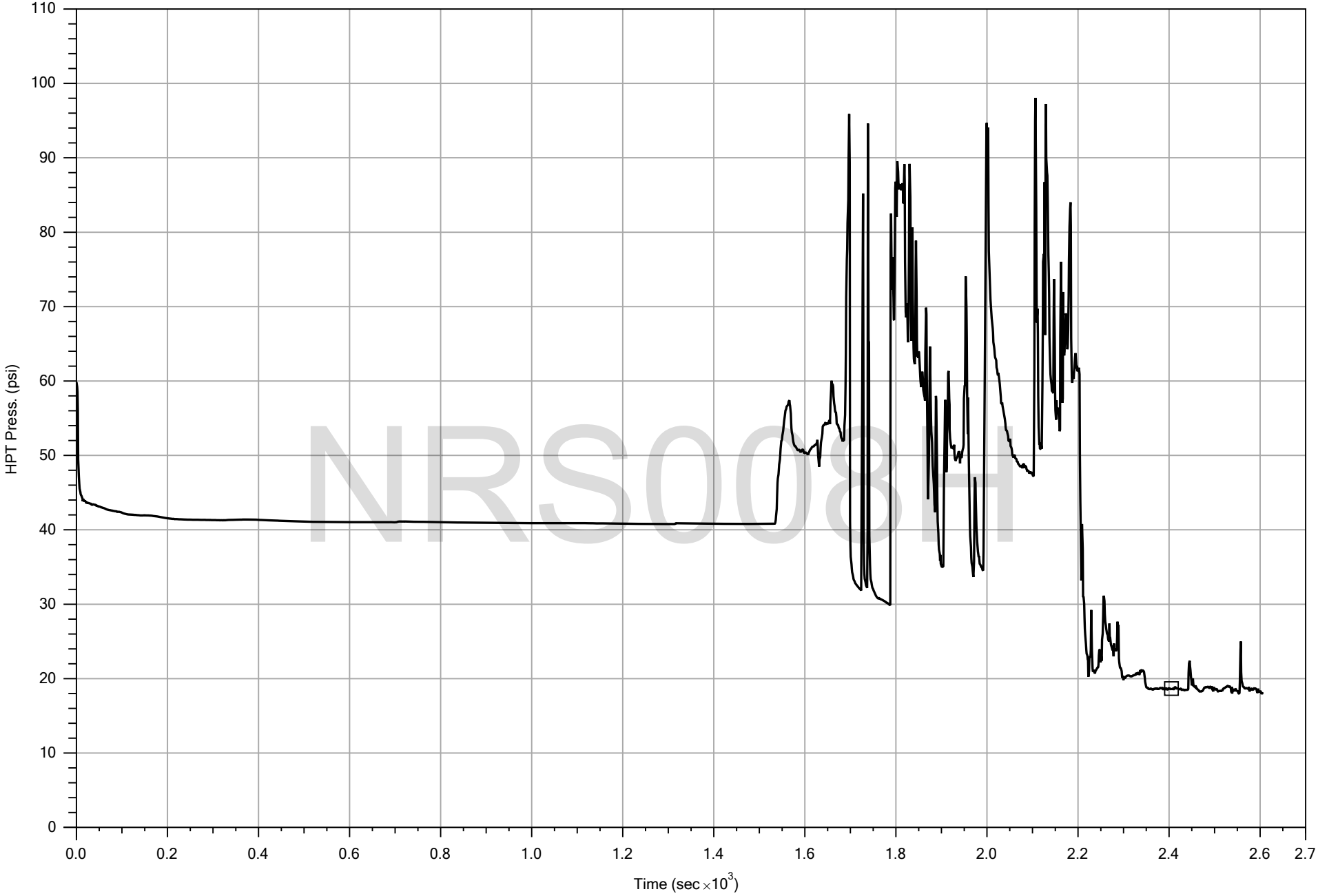
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 40.20 ft	Test: 1
		File: NRS008H.DIS	Date: 6/27/2015



HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 65.55 ft	Test: 1
File: NRS008H.DIS			Date: 6/27/2015



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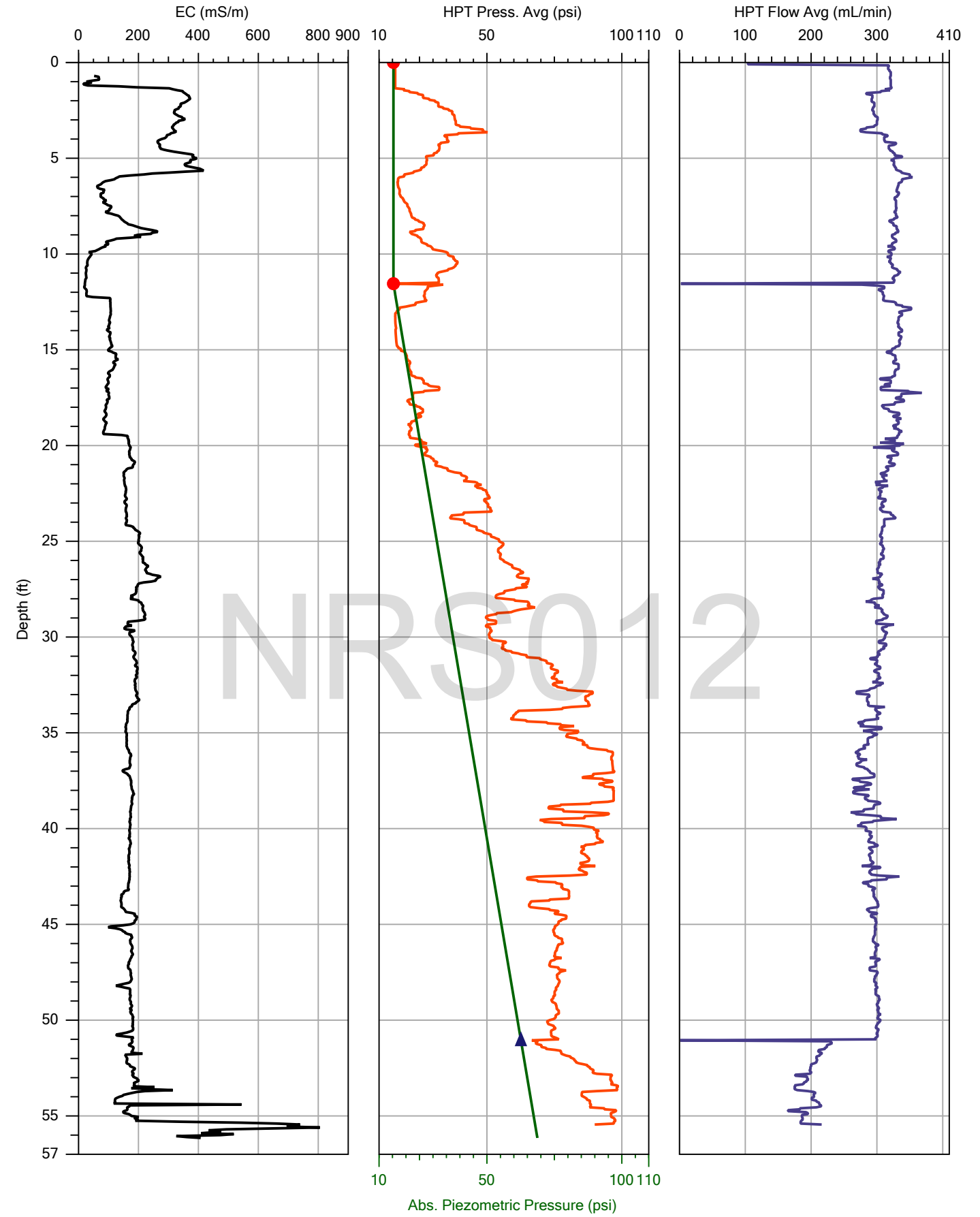
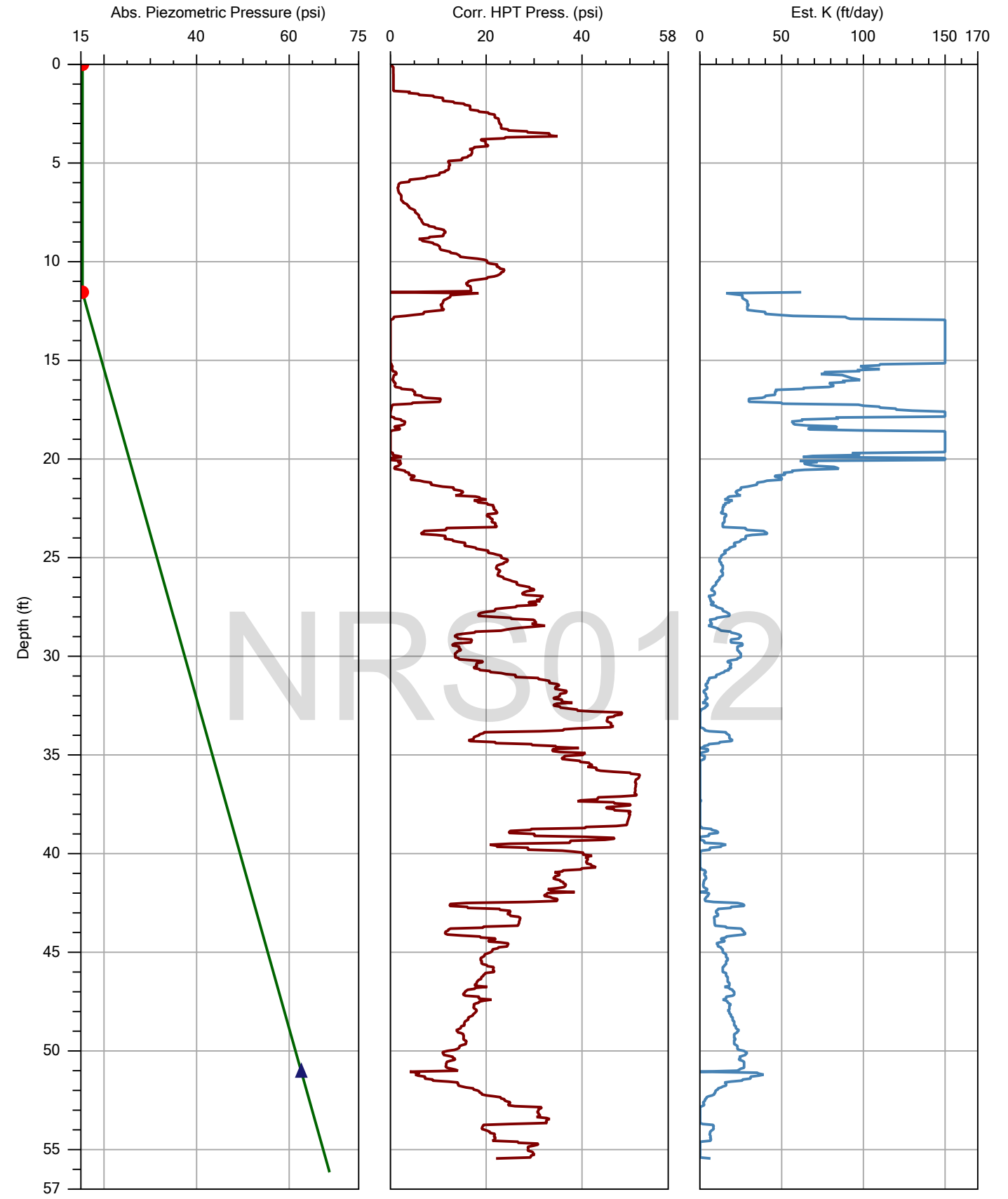
HPT DISSIPATION (SINGLE CASE)

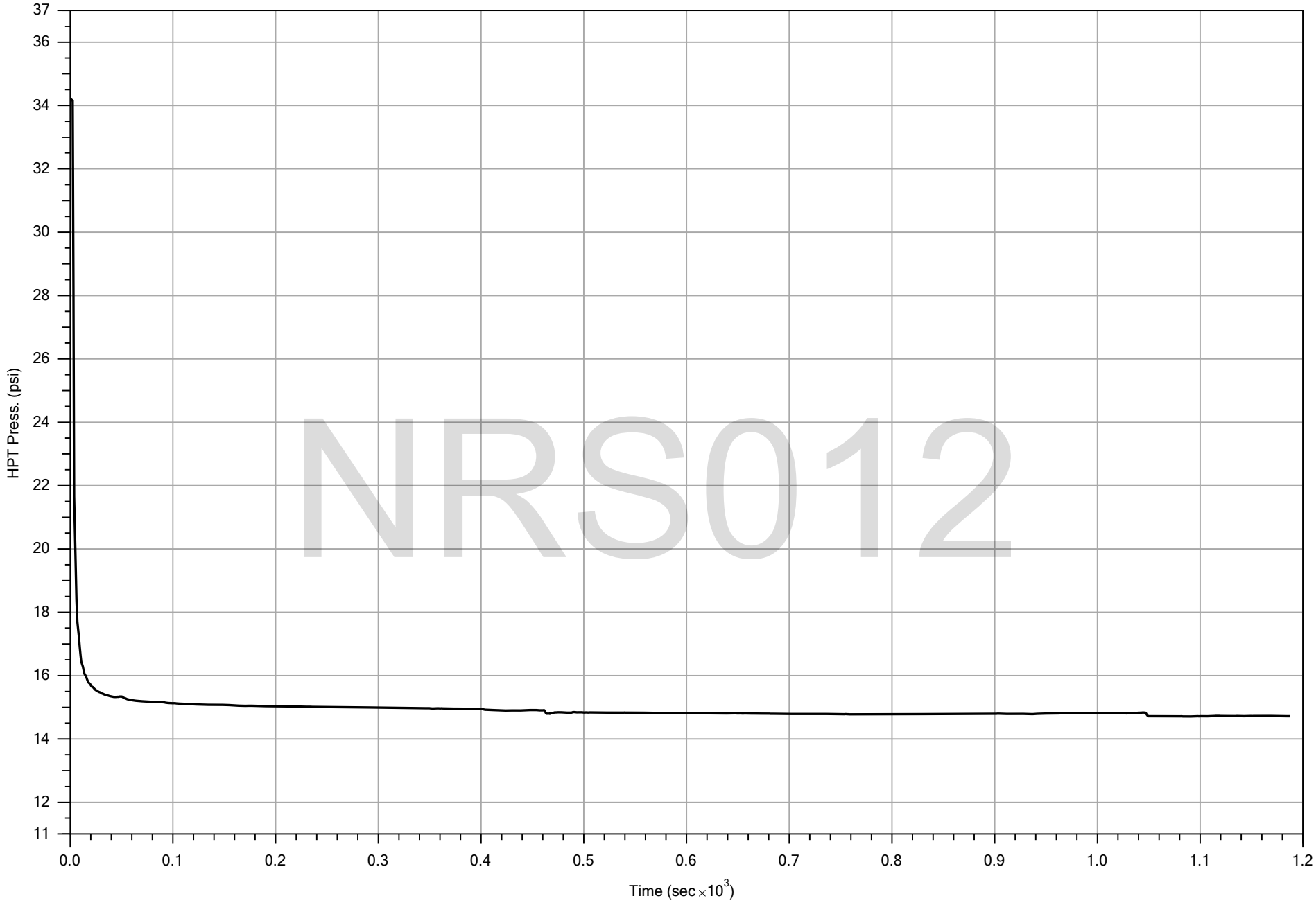
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 88.95 ft	Test: 1
File: NRS008H.DIS			Date: 6/27/2015



			File: NRS012H.DAT
Company: ZTS	Operator: RR	Date: 6/23/2015	
Project ID: TVA	Client: AECOM	Location:	



			File: NRS012H.DAT
Company: ZTS	Operator: RR		Date: 6/23/2015
Project ID: TVA	Client: AECOM		Location:



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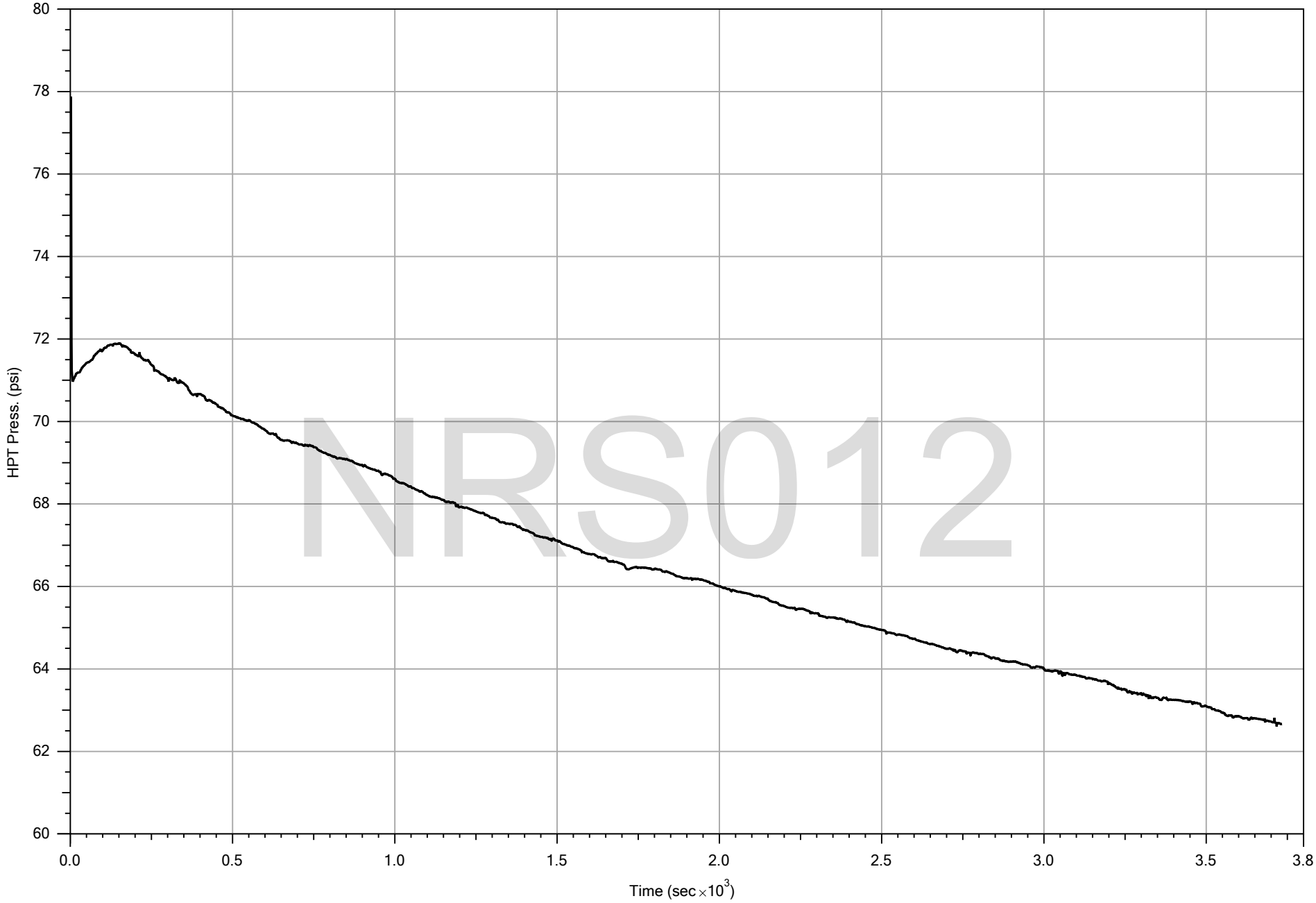
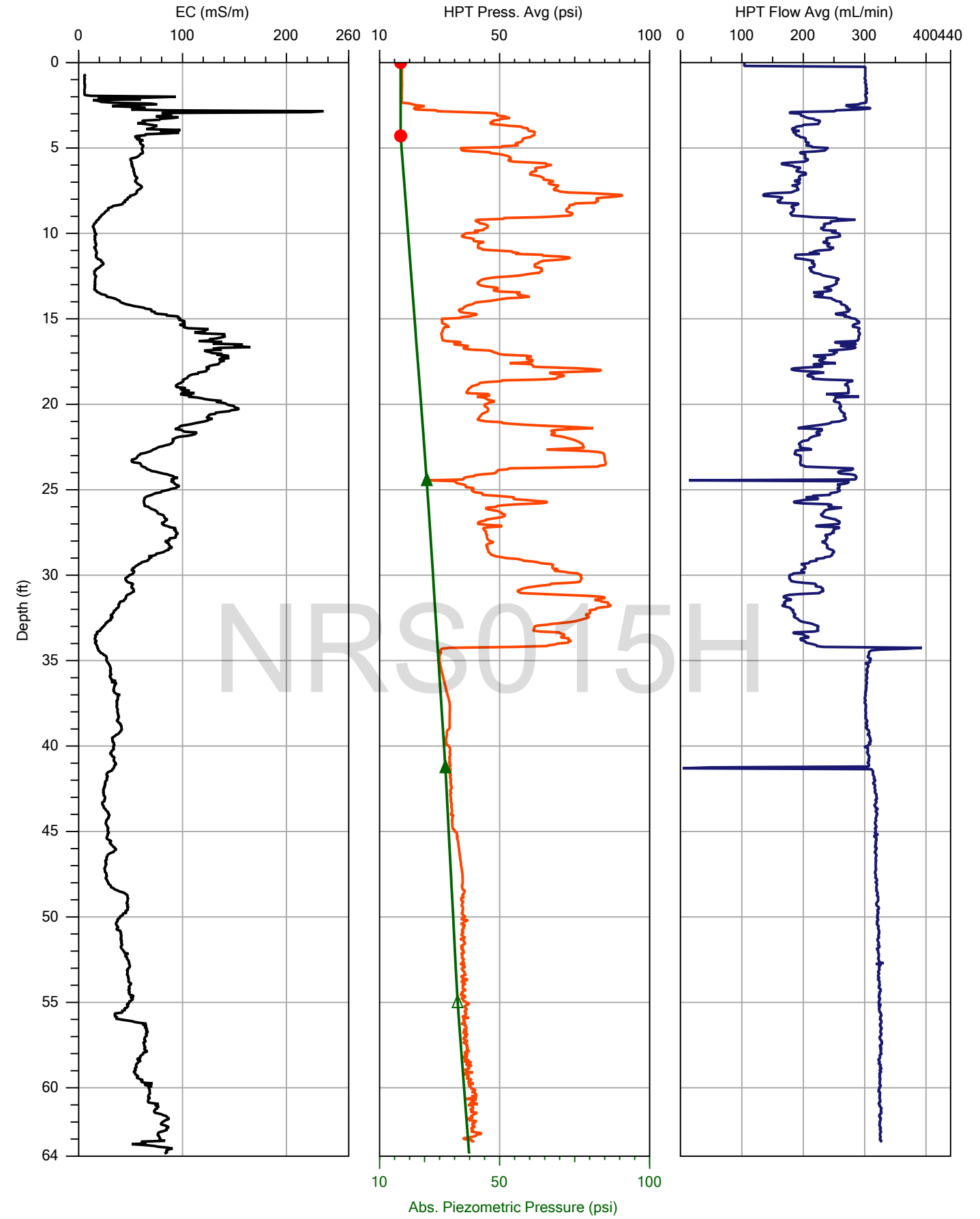
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 11.55 ft	Test: 1
		File: NRS012H.DIS	Date: 6/23/2015

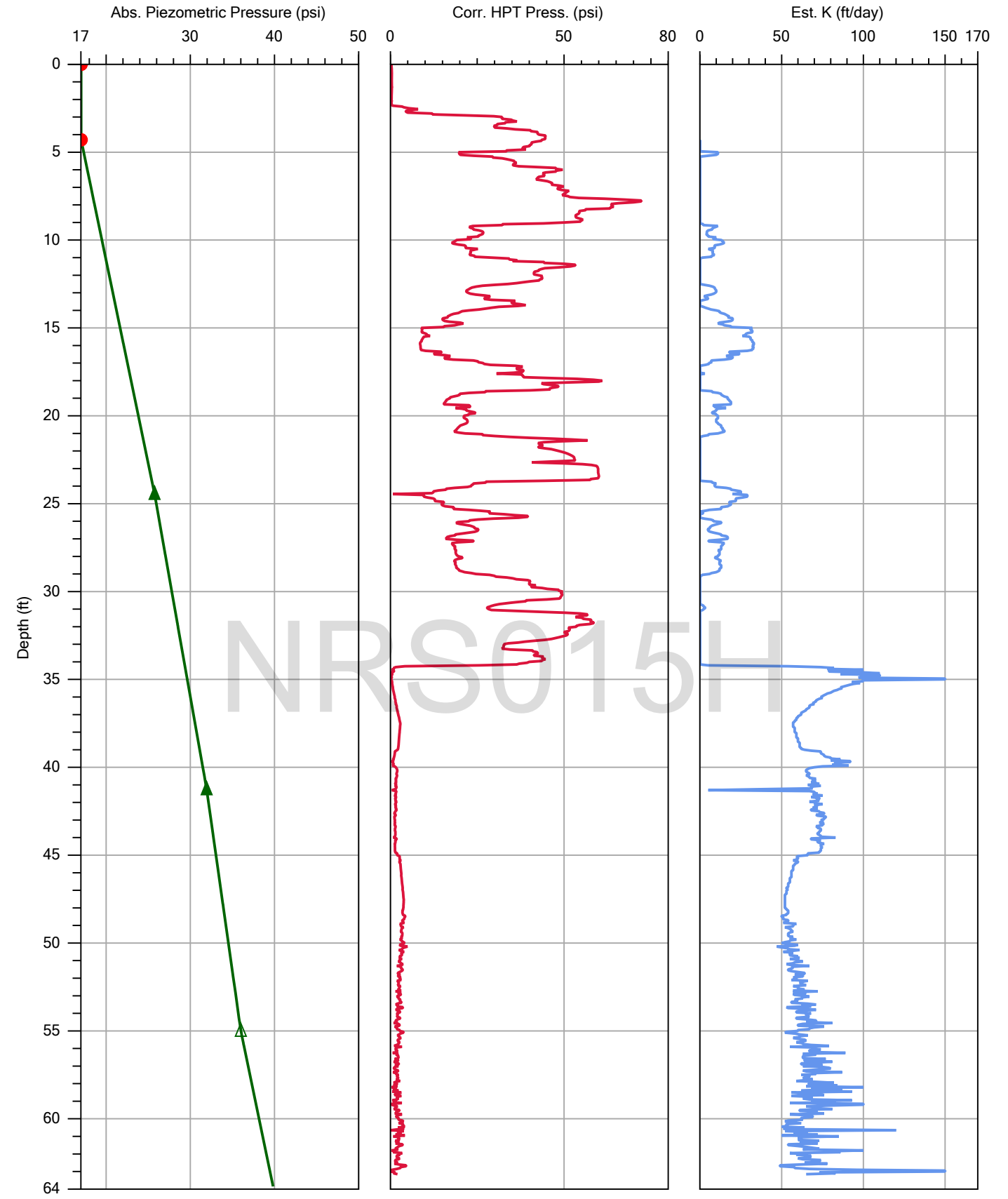


HPT DISSIPATION (SINGLE CASE)

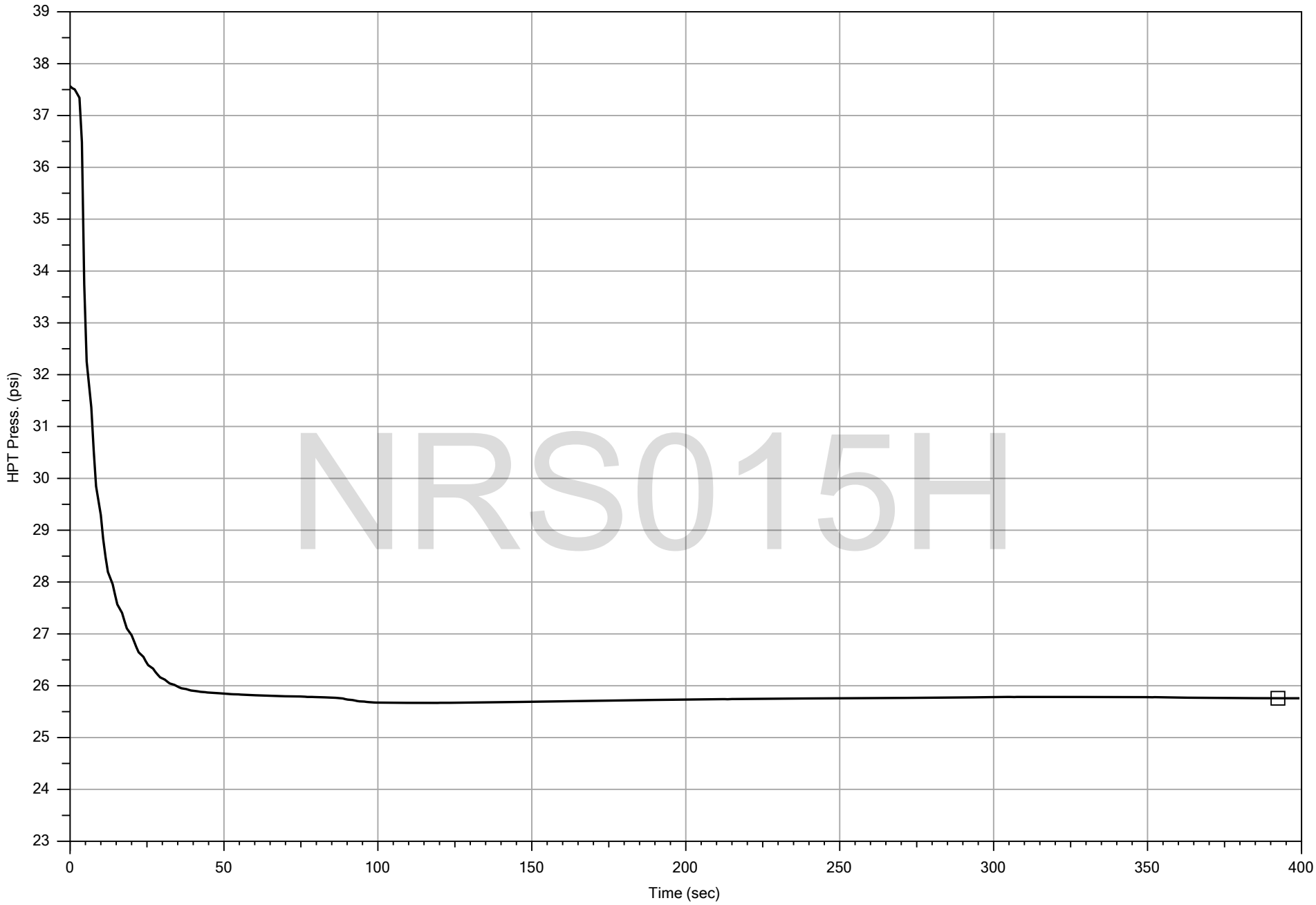
Company: ZTS	Operator: RR	File: NRS012H.DIS	Date: 6/23/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 51.05 ft	Test: 1



			File: NRS015H.DAT
Company: ZTS		Operator: RR	Date: 6/17/2015
Project ID: TVA		Client: AECOM	Location:

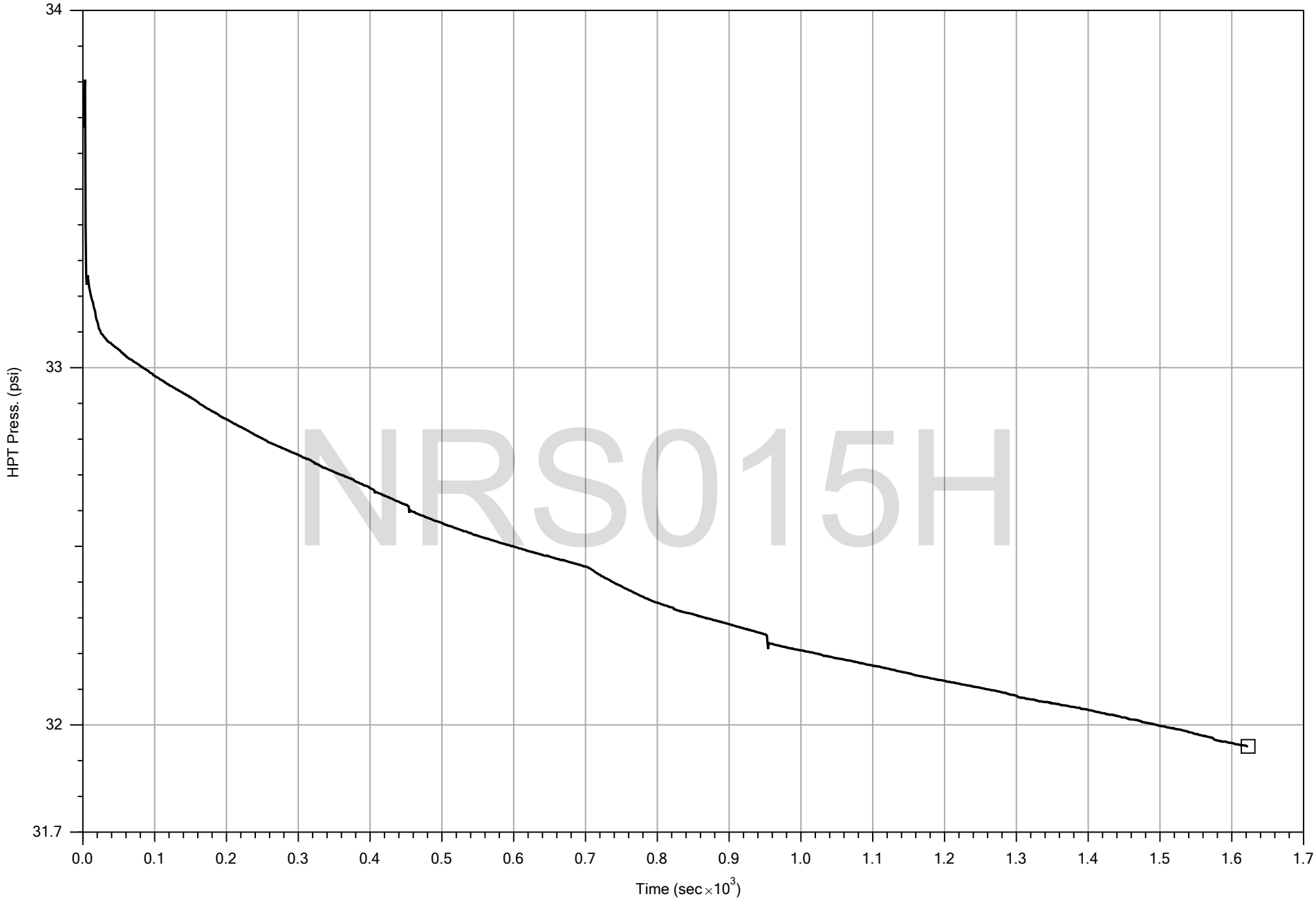


			File: NRS015H.DAT
Company: ZTS	Operator: RR		Date: 6/17/2015
Project ID: TVA	Client: AECOM		Location:



HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS015H.DIS	Date: 6/17/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 24.45 ft	Test: 1



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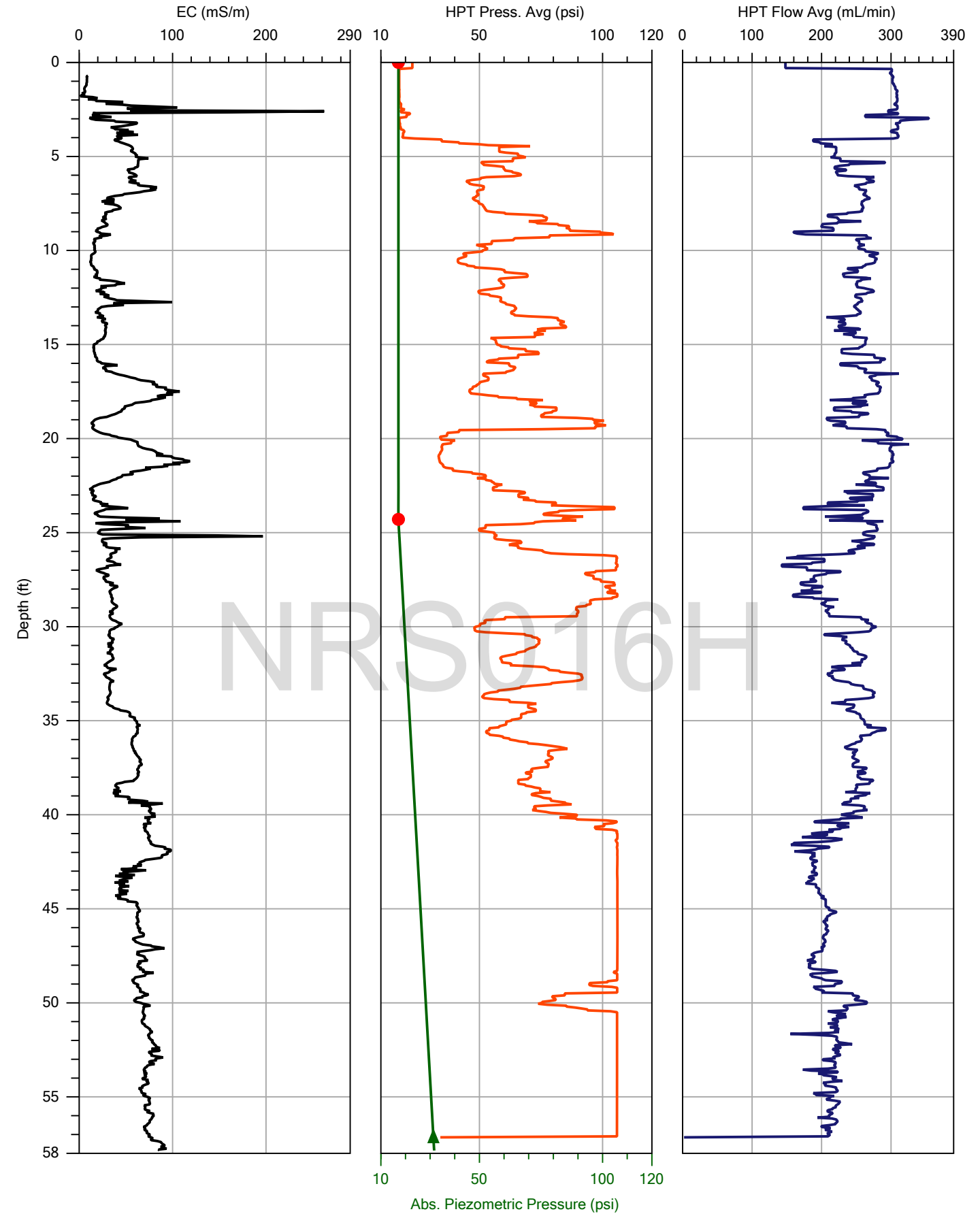
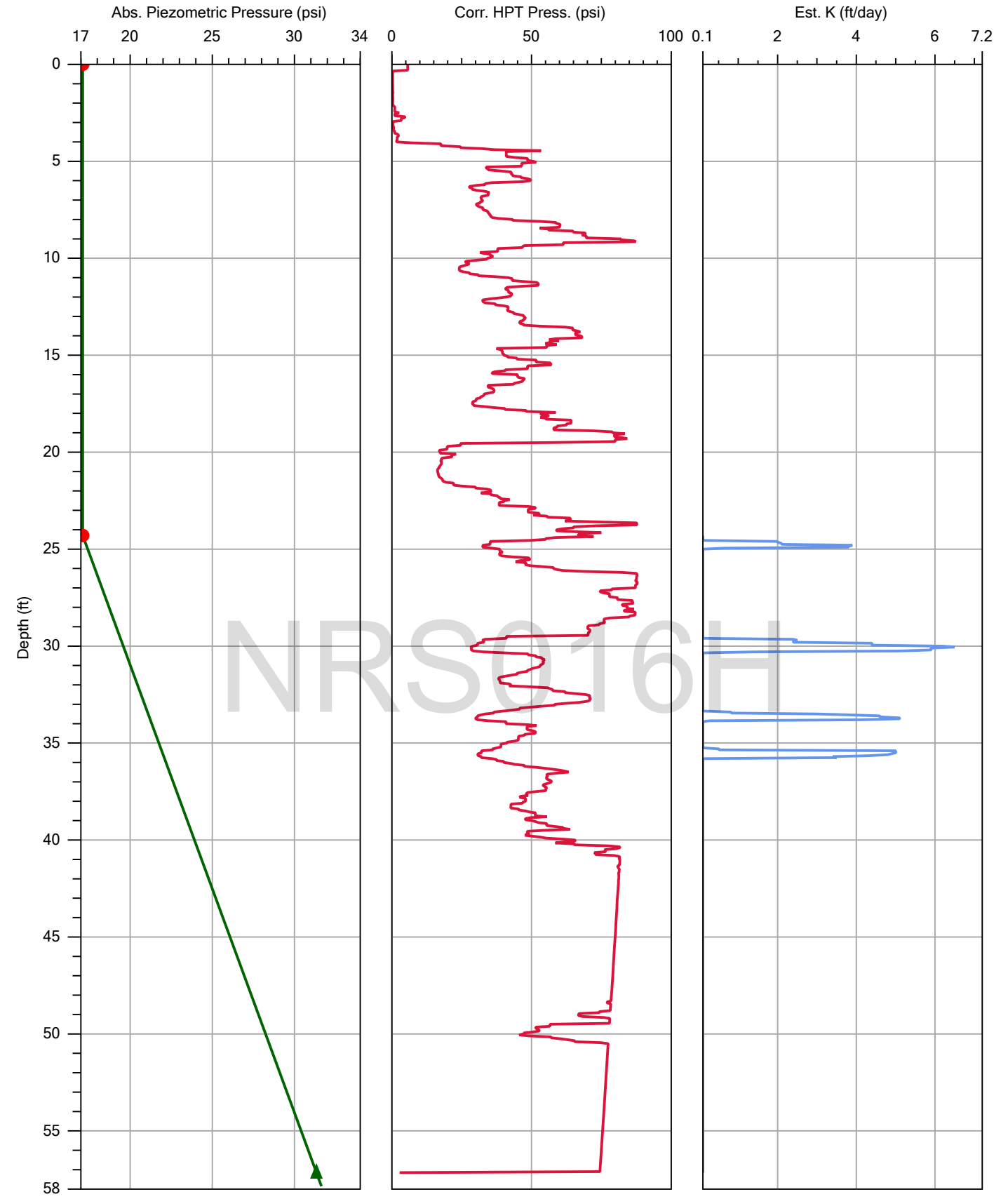
HPT DISSIPATION (SINGLE CASE)

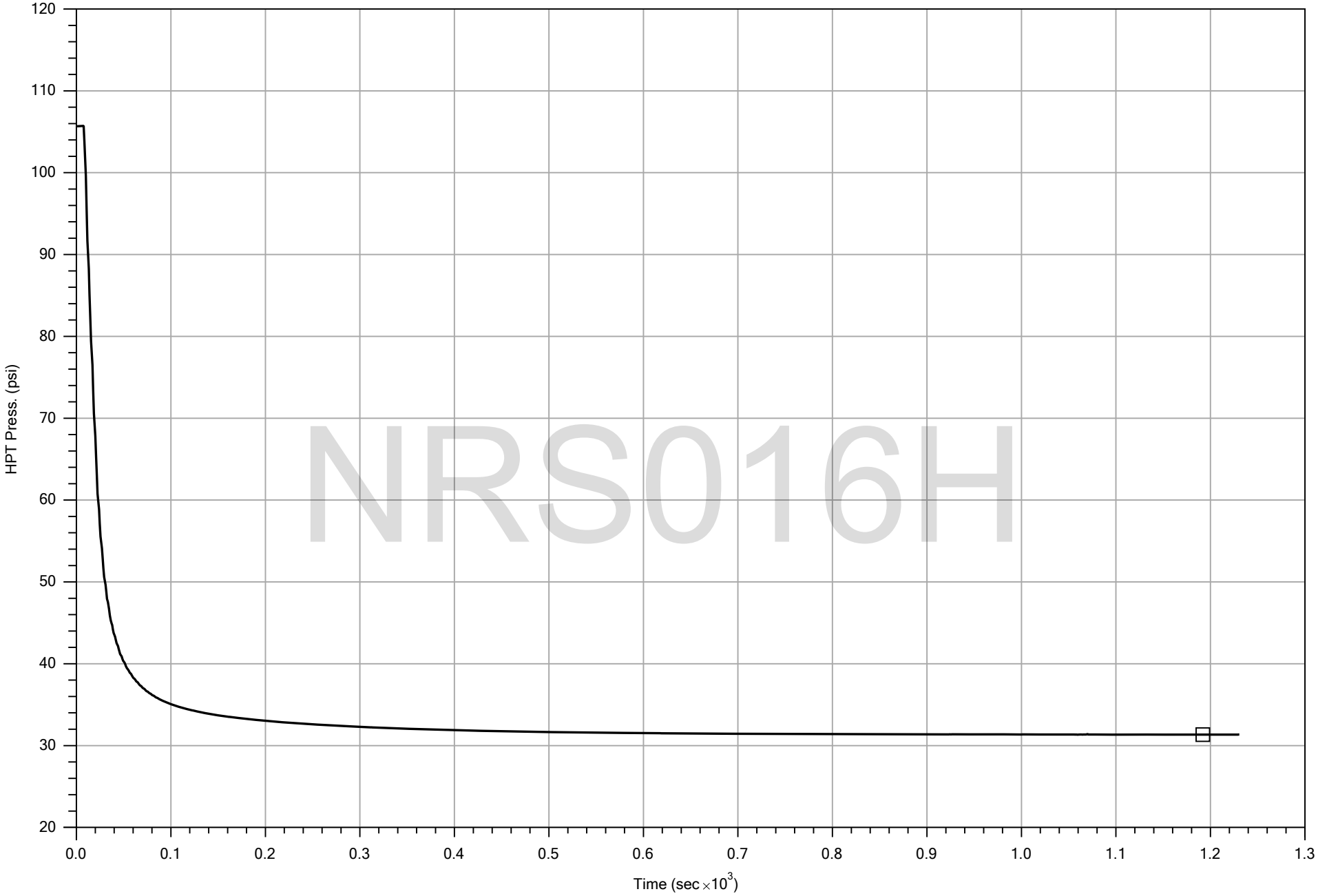
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 41.25 ft	Test: 1
		File: NRS015H.DIS	Date: 6/17/2015



			File: NRS016H.DAT
Company: ZTS		Operator: RR	Date: 6/17/2015
Project ID: TVA		Client: AECOM	Location:

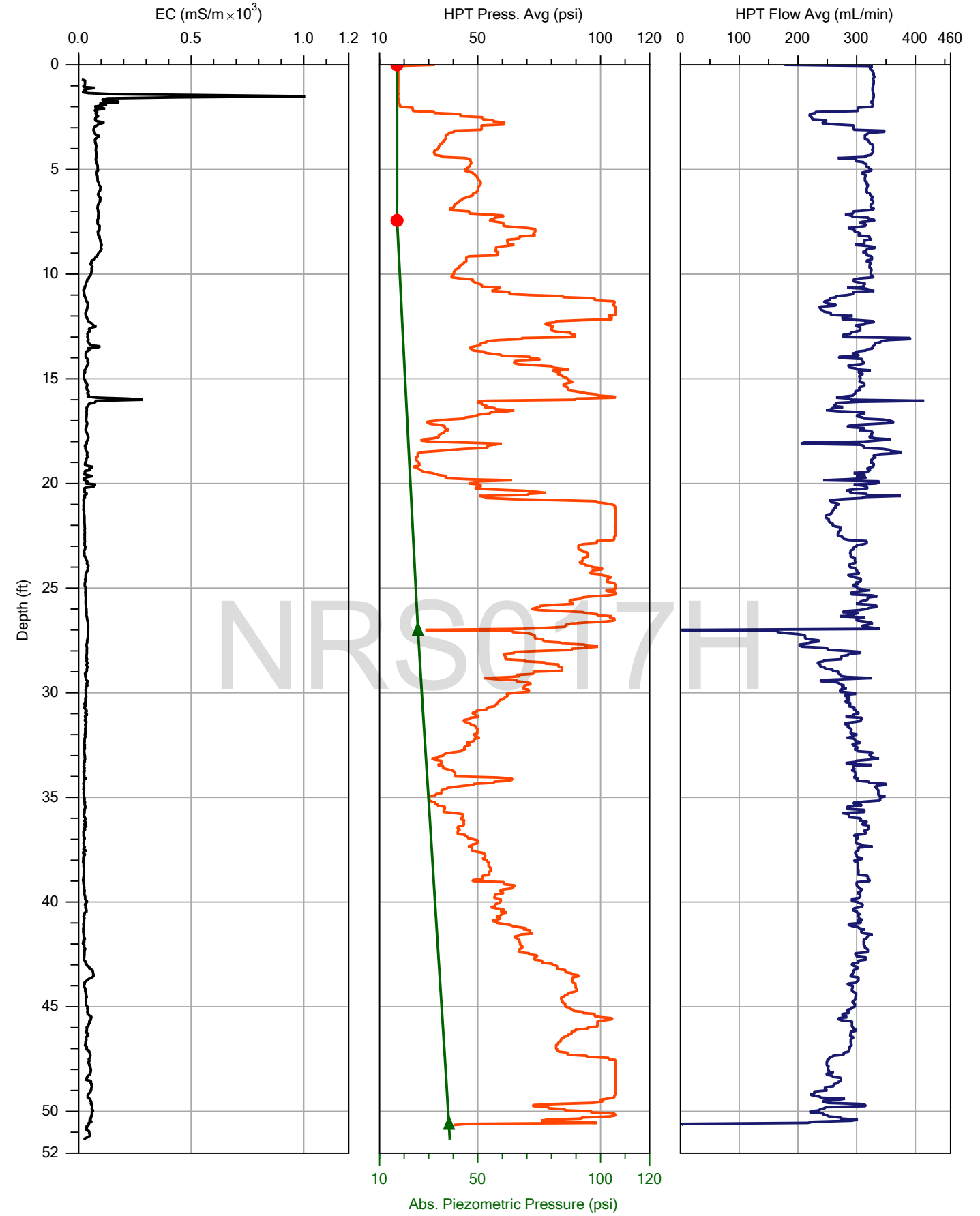


			File: NRS016H.DAT
Company: ZTS	Operator: RR		Date: 6/17/2015
Project ID: TVA	Client: AECOM		Location:

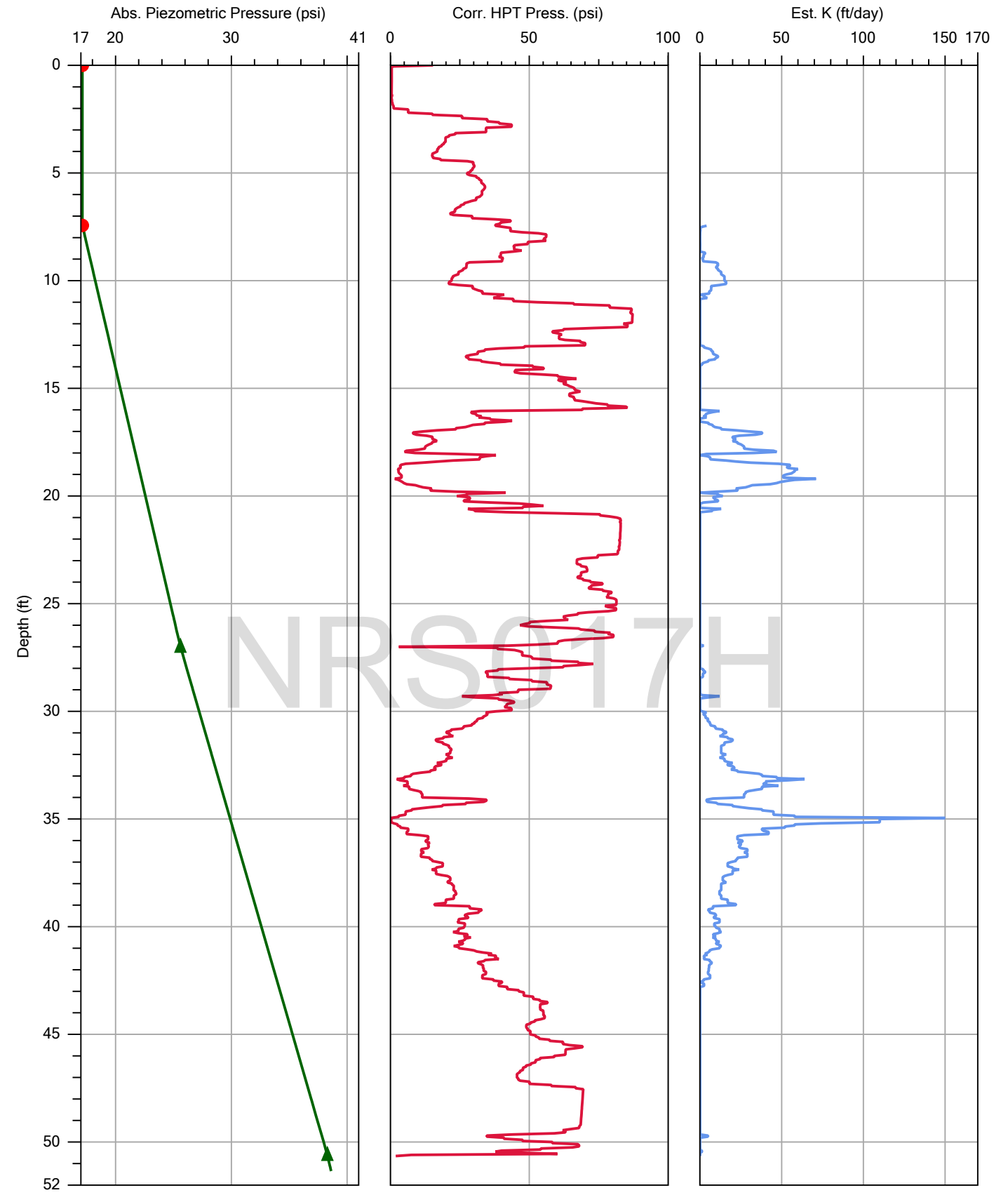


HPT DISSIPATION (SINGLE CASE)

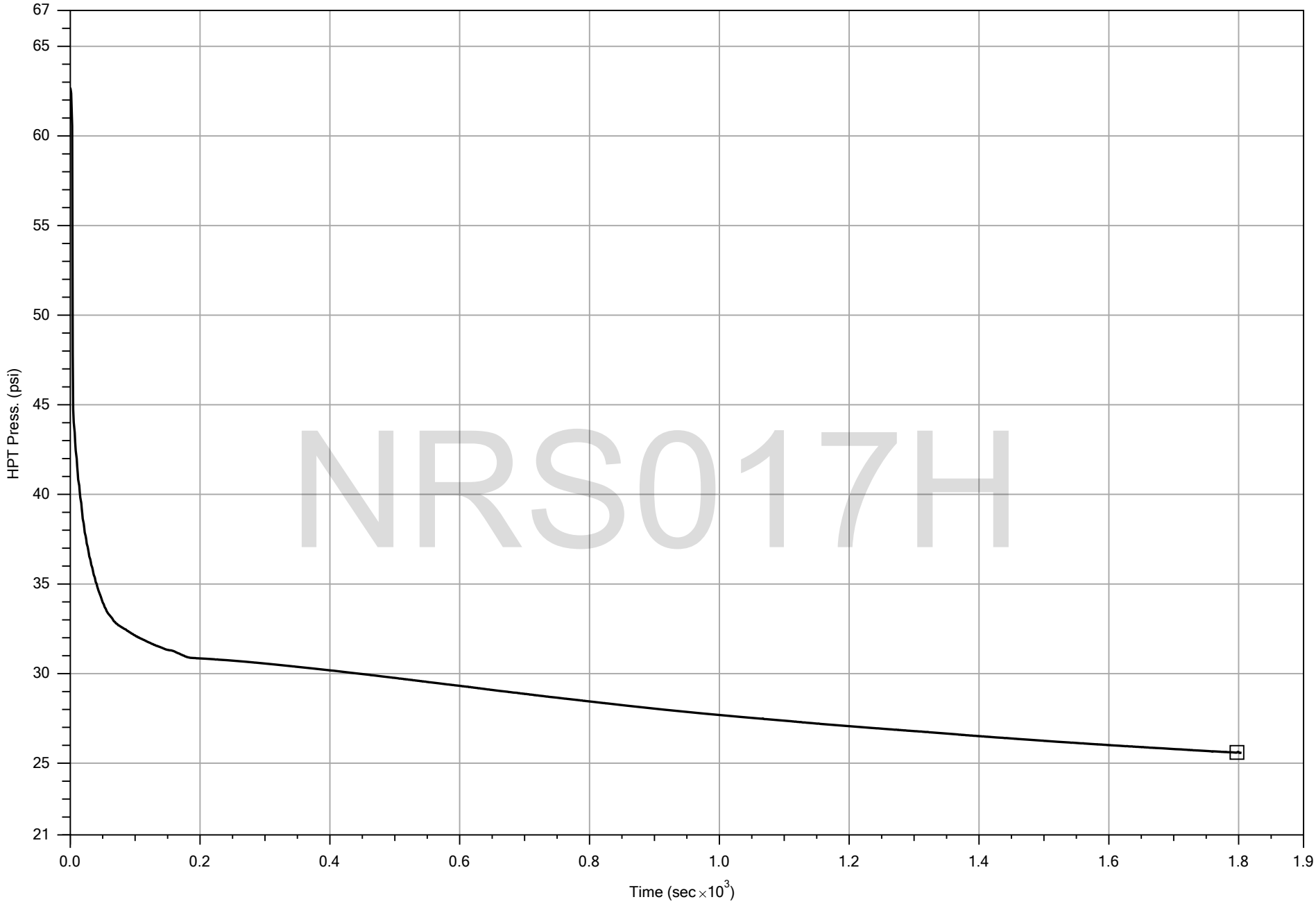
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 57.15 ft	Test: 1
		File: NRS016H.DIS	Date: 6/17/2015



			File: NRS017H.DAT
Company: ZTS	Operator: RR		Date: 6/17/2015
Project ID: TVA	Client: AECOM		Location:



			File: NRS017H.DAT
Company: ZTS	Operator: RR		Date: 6/17/2015
Project ID: TVA	Client: AECOM		Location:



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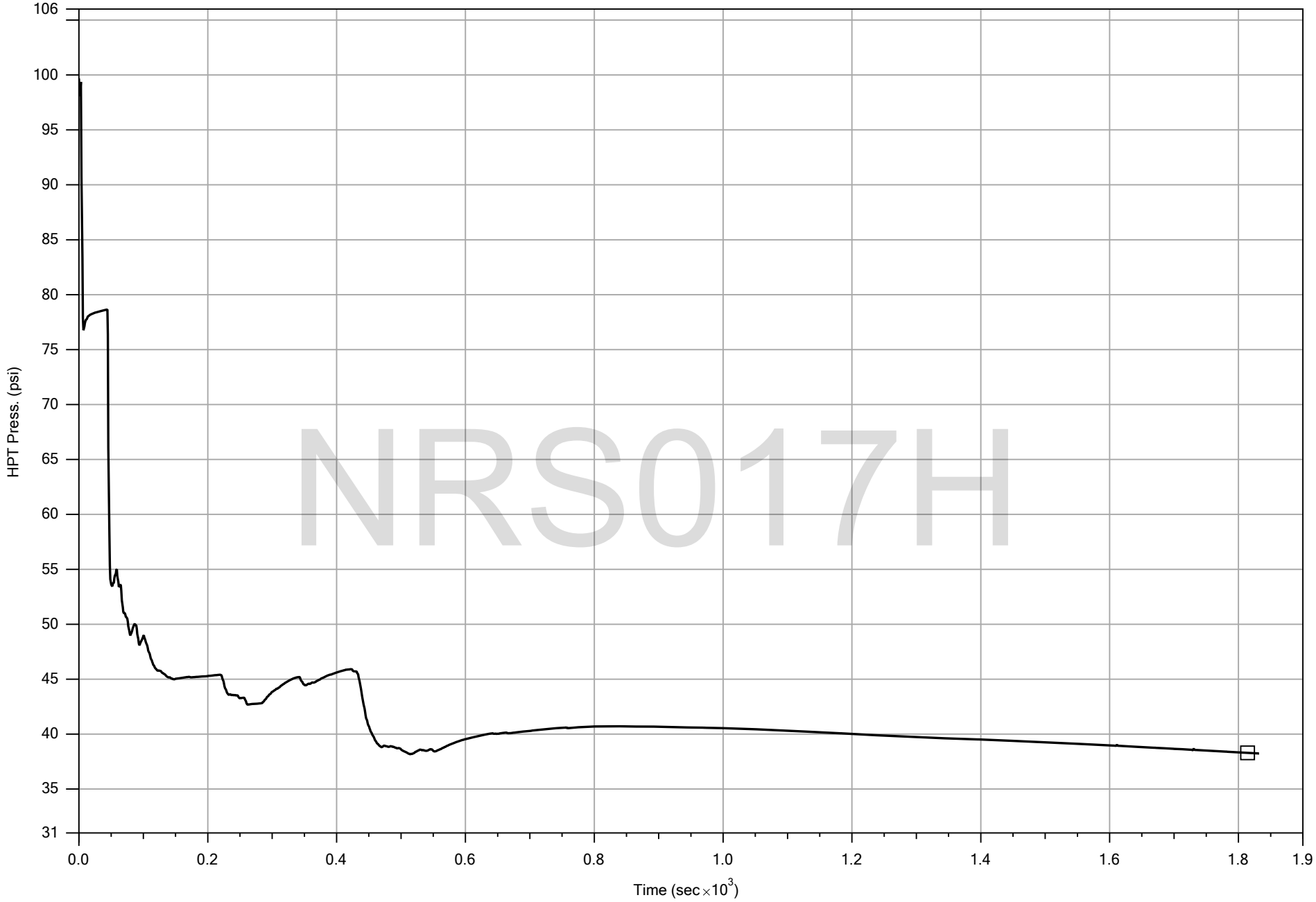
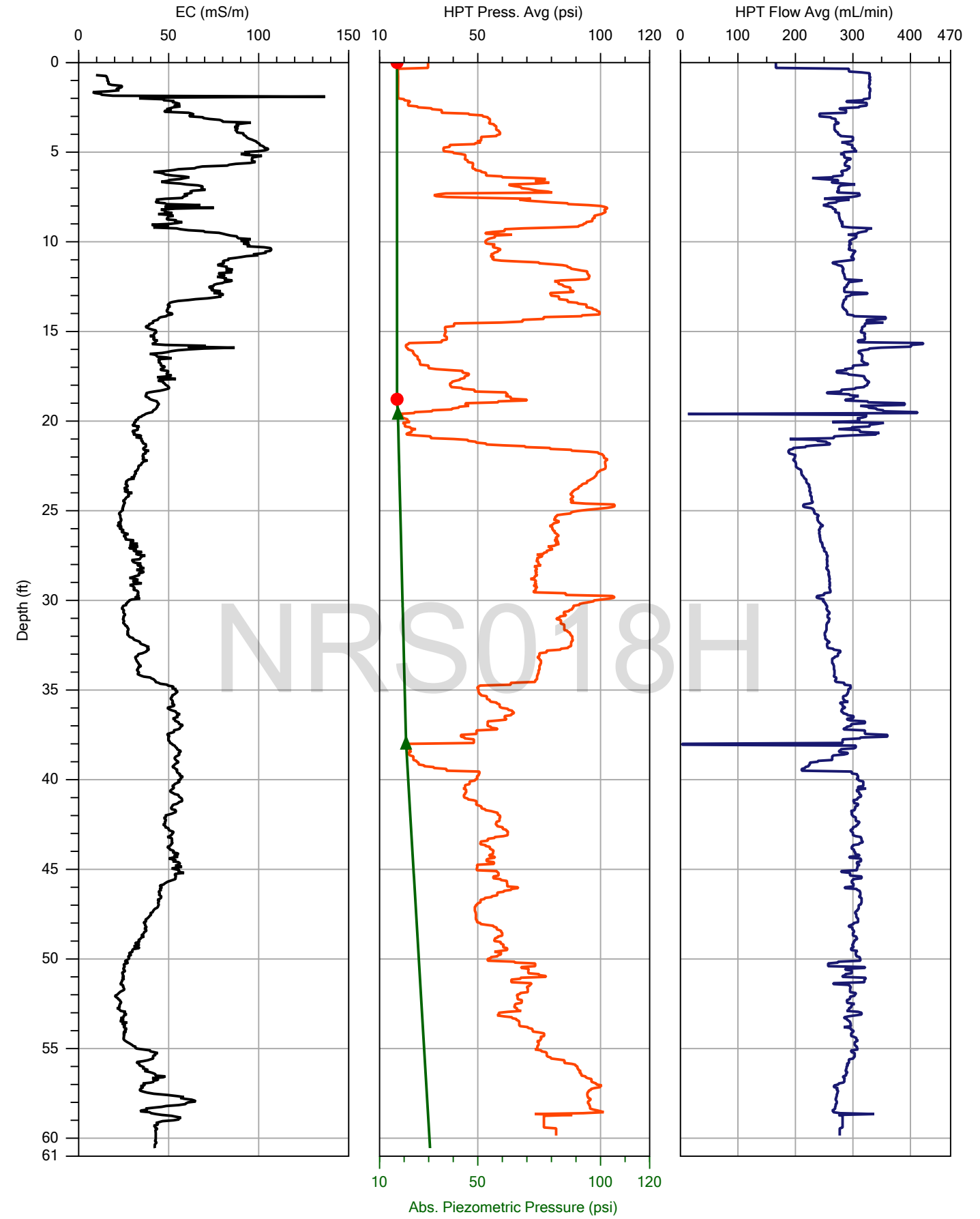
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 27.00 ft	Test: 1
File: NRS017H.DIS			Date: 6/17/2015

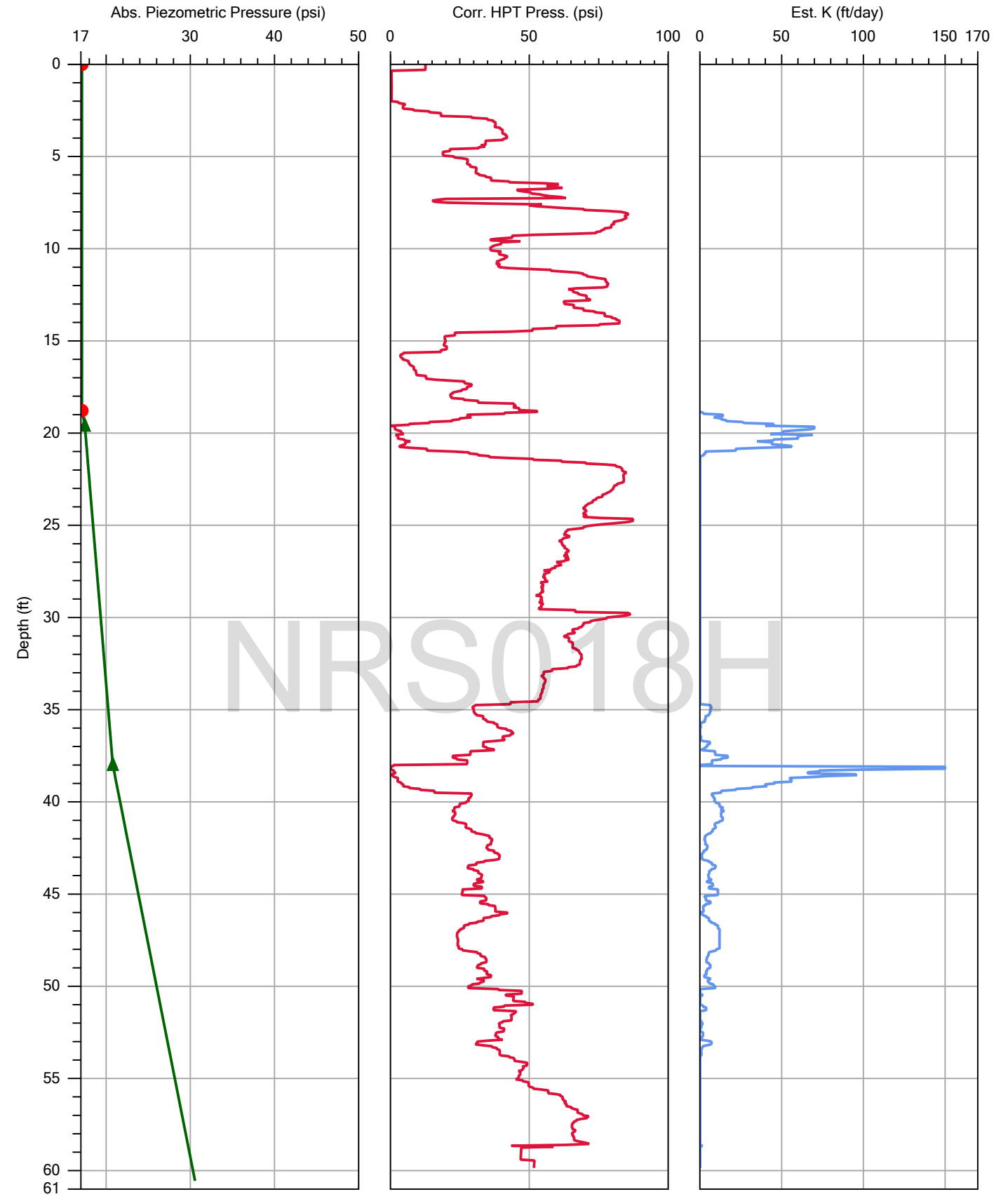


HPT DISSIPATION (SINGLE CASE)

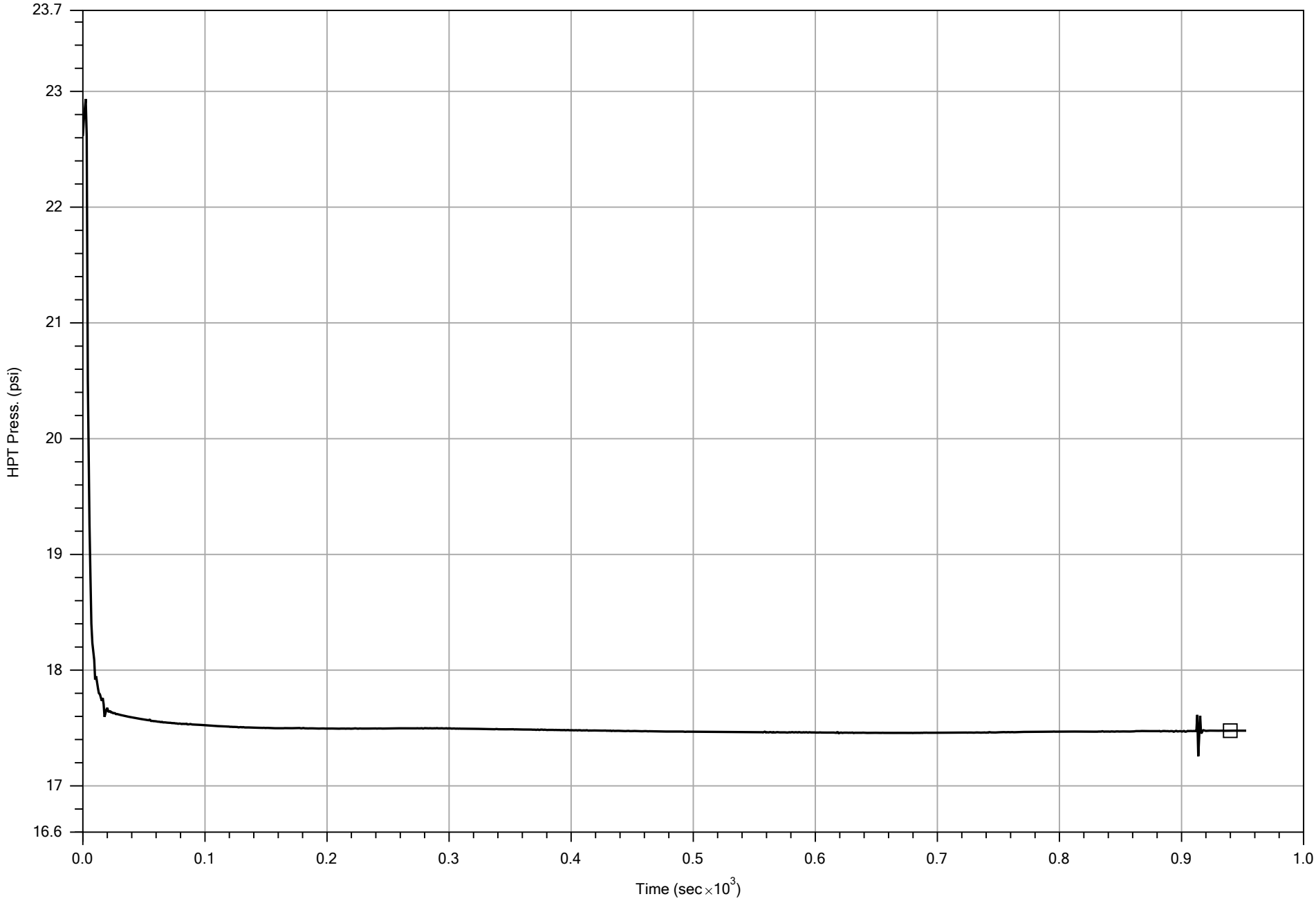
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 50.60 ft	Test: 1
File: NRS017H.DIS			Date: 6/17/2015



			File: NRS018H.DAT
Company: ZTS	Operator: RR		Date: 6/17/2015
Project ID: TVA	Client: AECOM		Location:

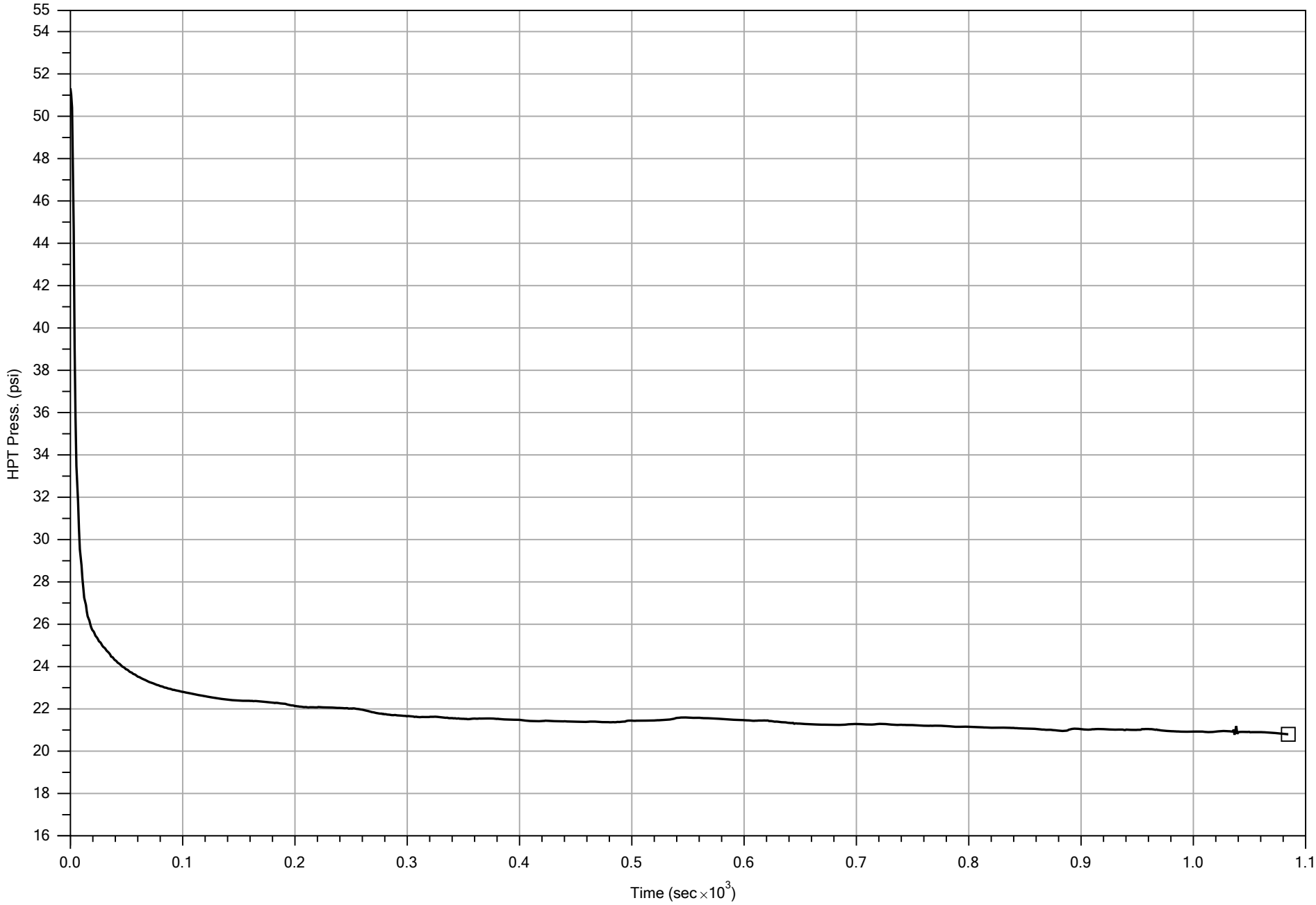


			File: NRS018H.DAT
Company: ZTS	Operator: RR		Date: 6/17/2015
Project ID: TVA	Client: AECOM		Location:



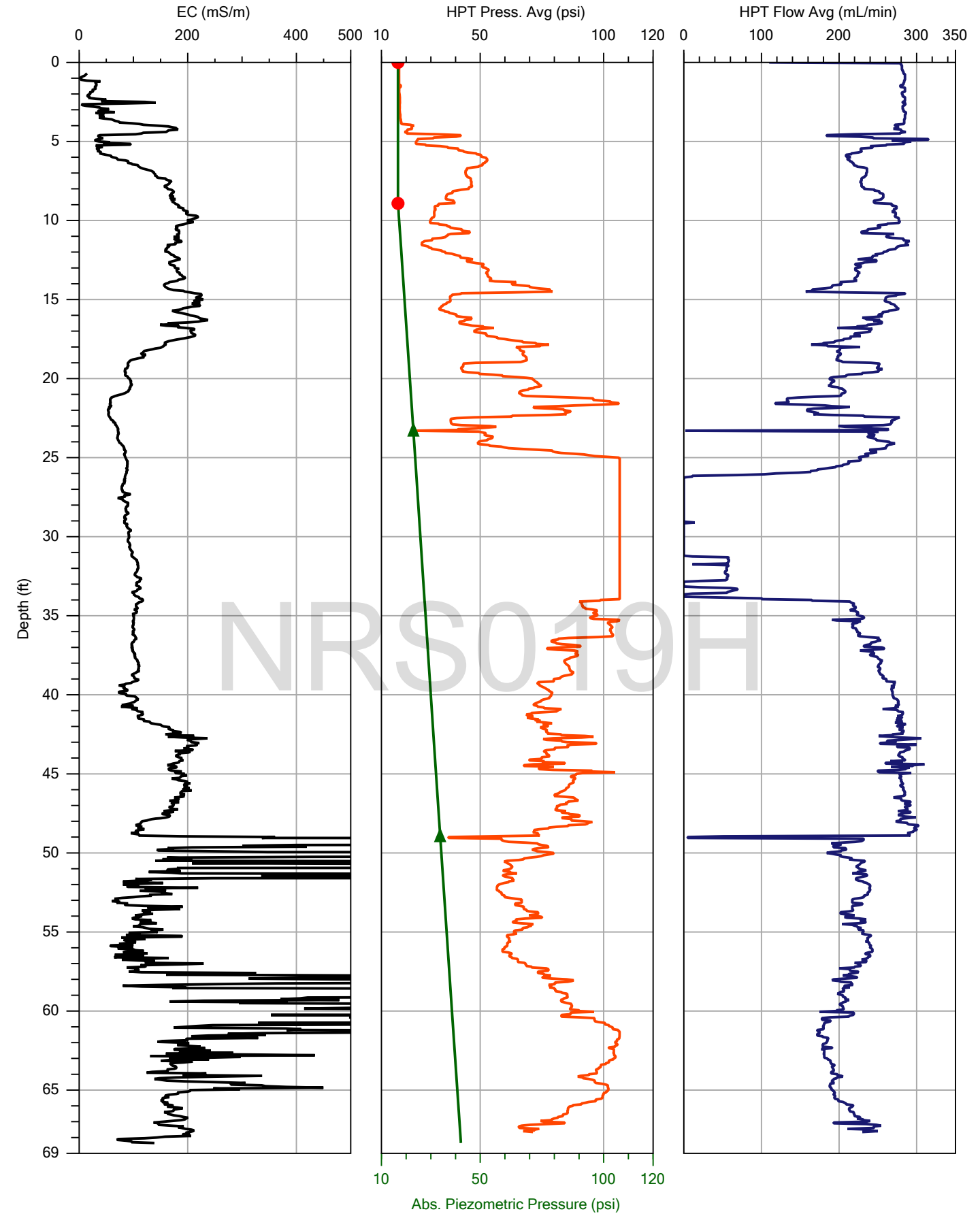
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS018H.DIS	Date: 6/17/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 19.60 ft	Test: 1

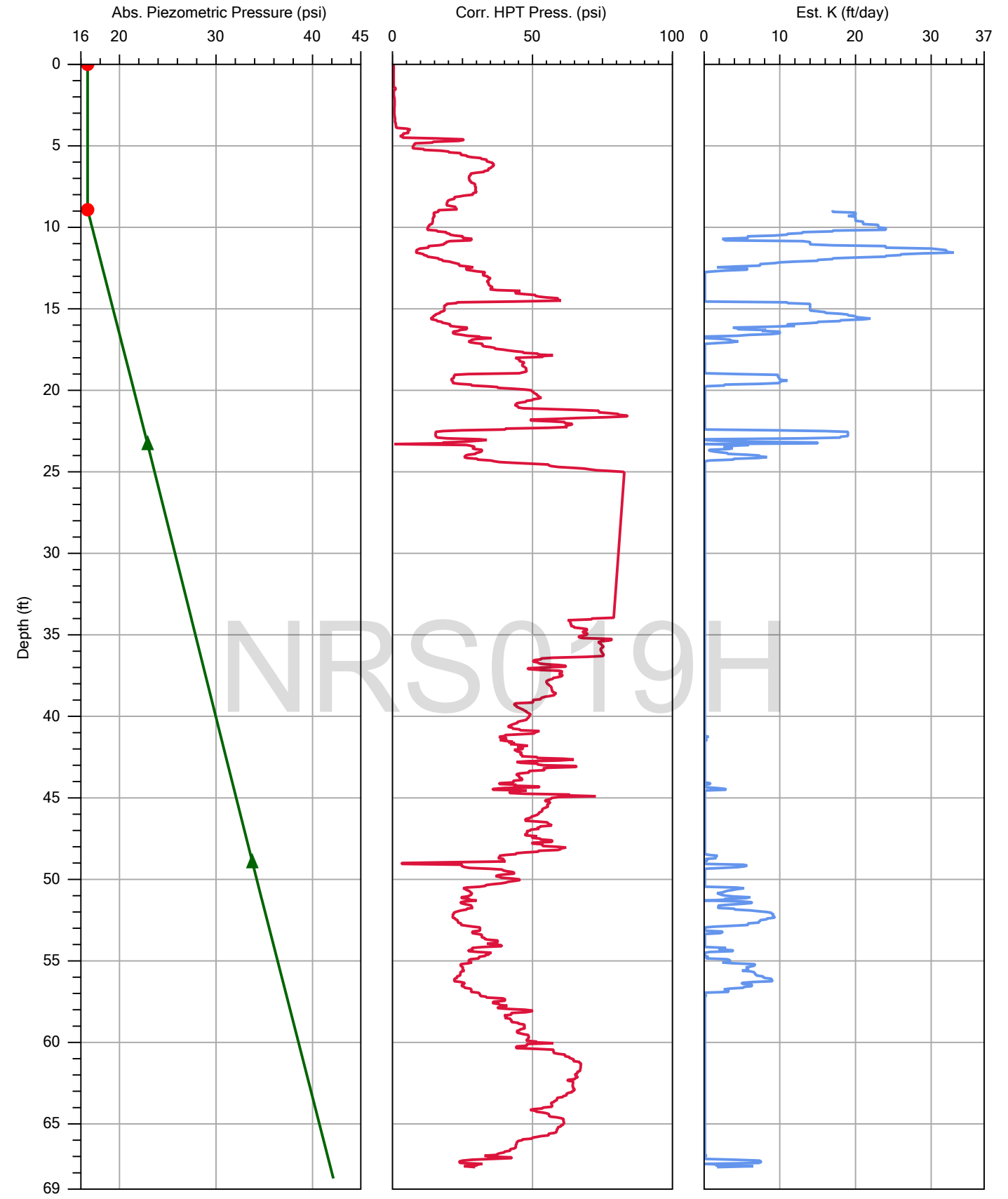


HPT DISSIPATION (SINGLE CASE)

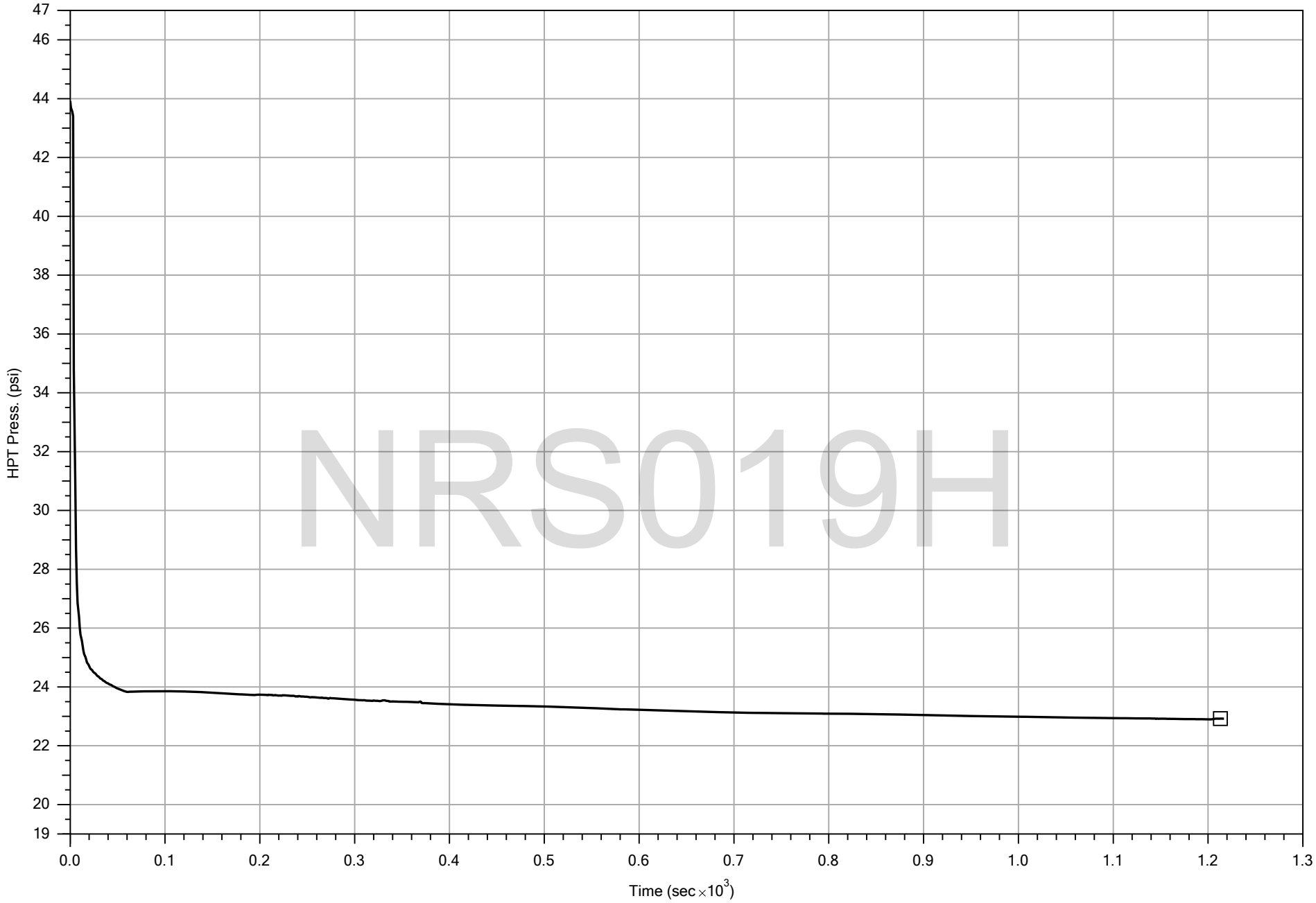
Company: ZTS	Operator: RR	File: NRS018H.DIS	Date: 6/17/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 38.00 ft	Test: 1



			File: NRS019HC.DAT
Company: ZTS	Operator: RR		Date: 6/18/2015
Project ID: TVA	Client: AECOM		Location:



			File: NRS019HC.DAT
Company: ZTS	Operator: RR		Date: 6/18/2015
Project ID: TVA	Client: AECOM		Location:



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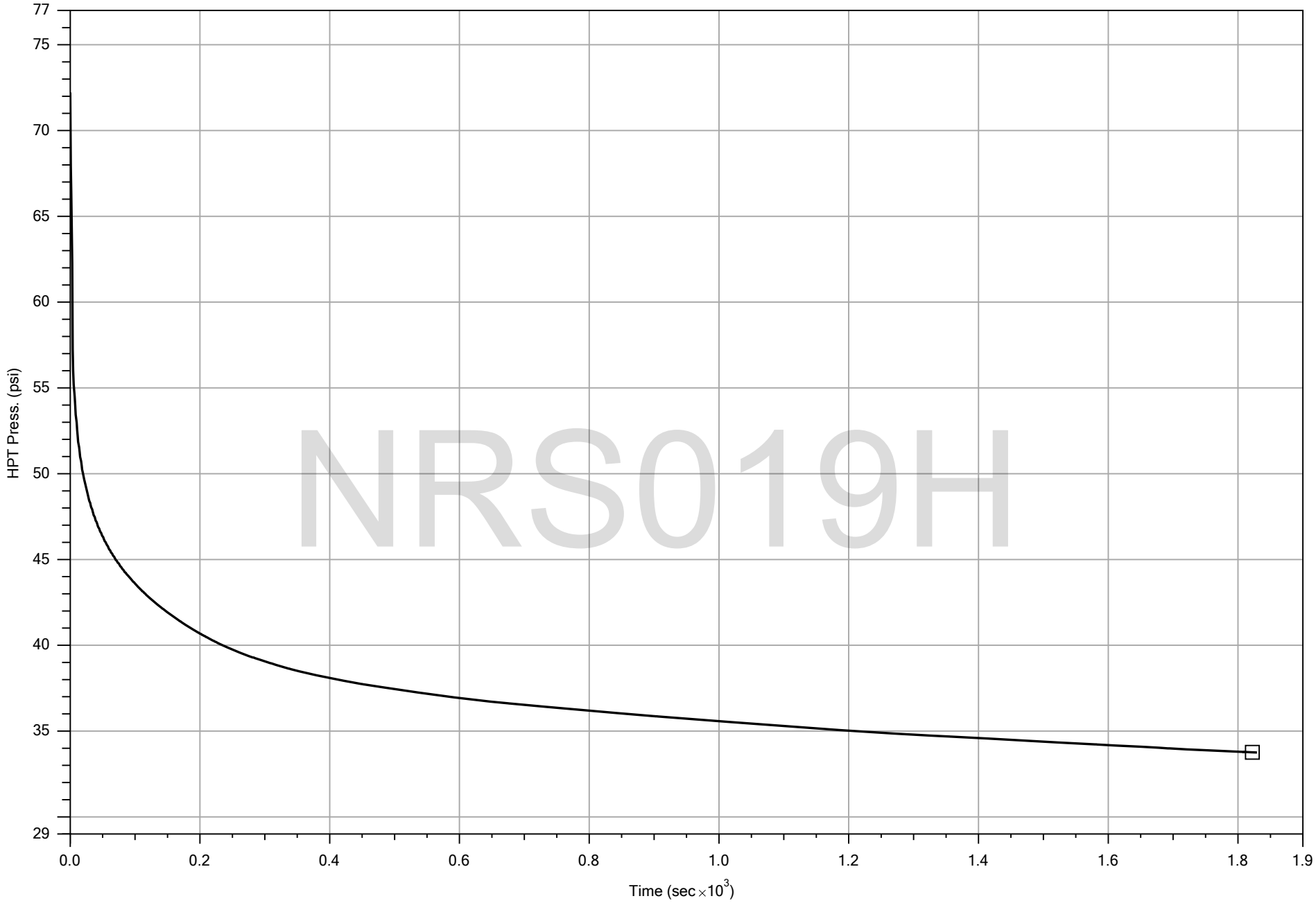
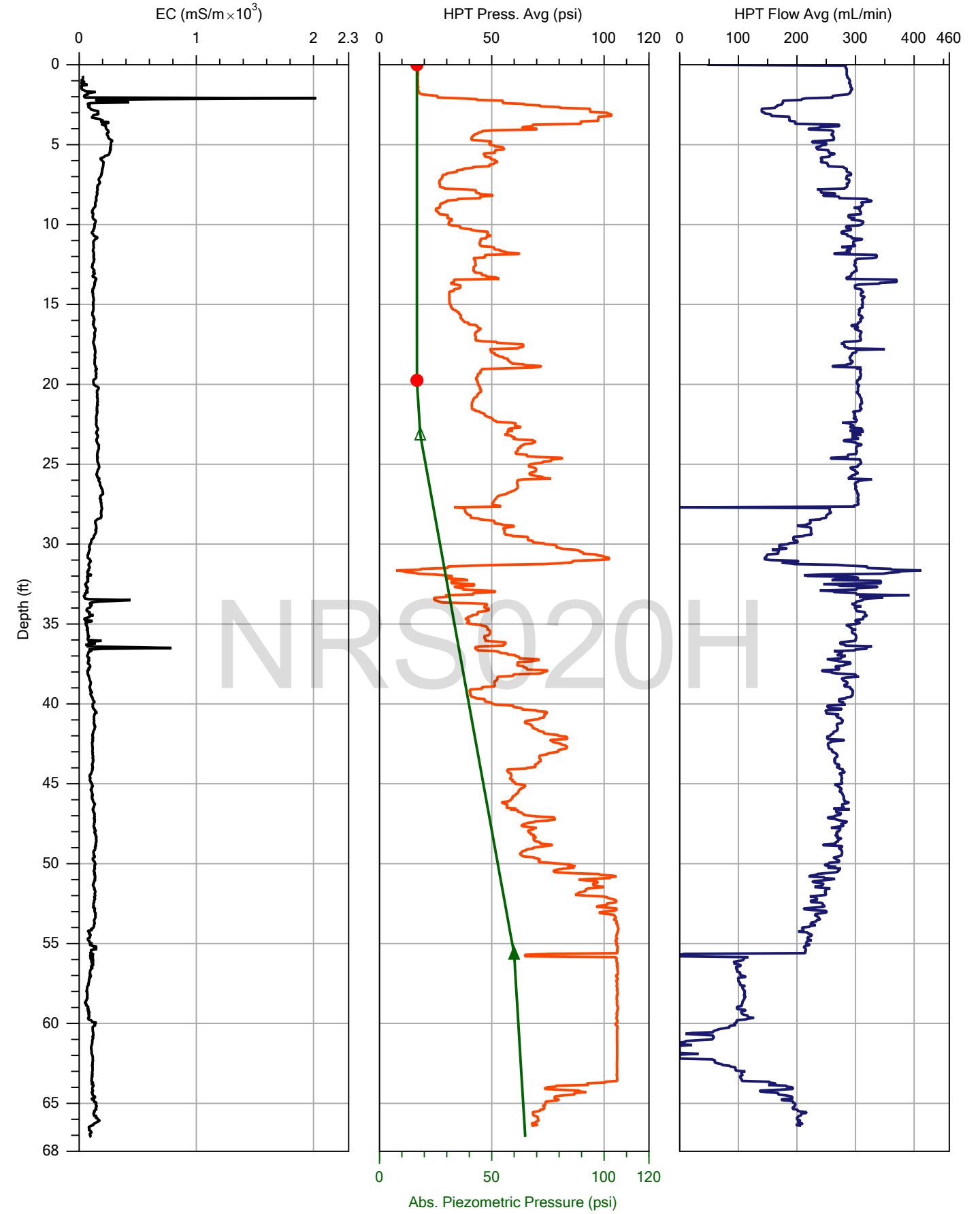
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS019HC.DIS	Date: 6/18/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 23.30 ft	Test: 1

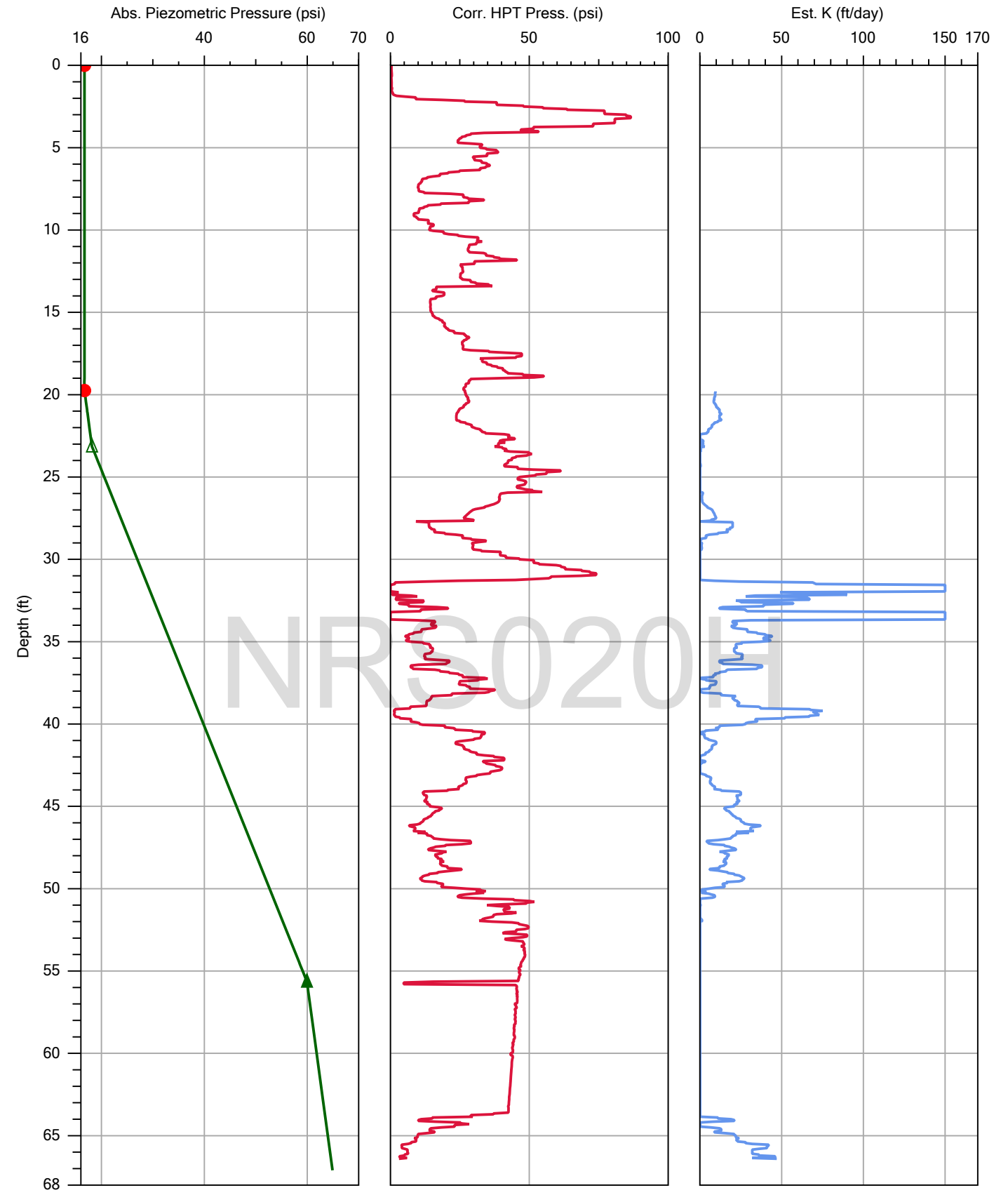


HPT DISSIPATION (SINGLE CASE)

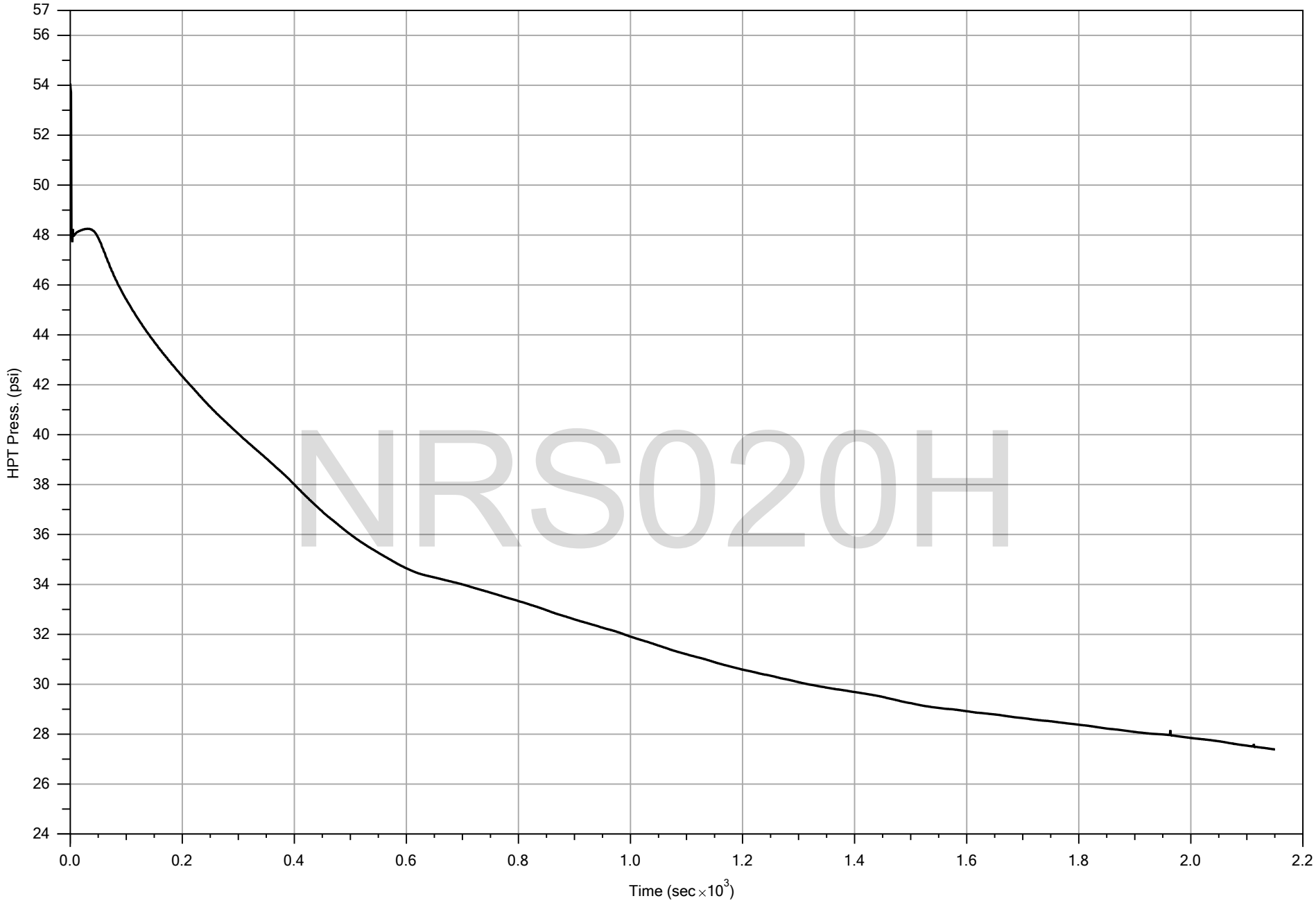
Company: ZTS	Operator: RR	File: NRS019HC.DIS	Date: 6/18/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 48.95 ft	Test: 1



			File: NRS020H.DAT
Company: ZTS	Operator: RR		Date: 6/18/2015
Project ID: TVA	Client: AECOM		Location:



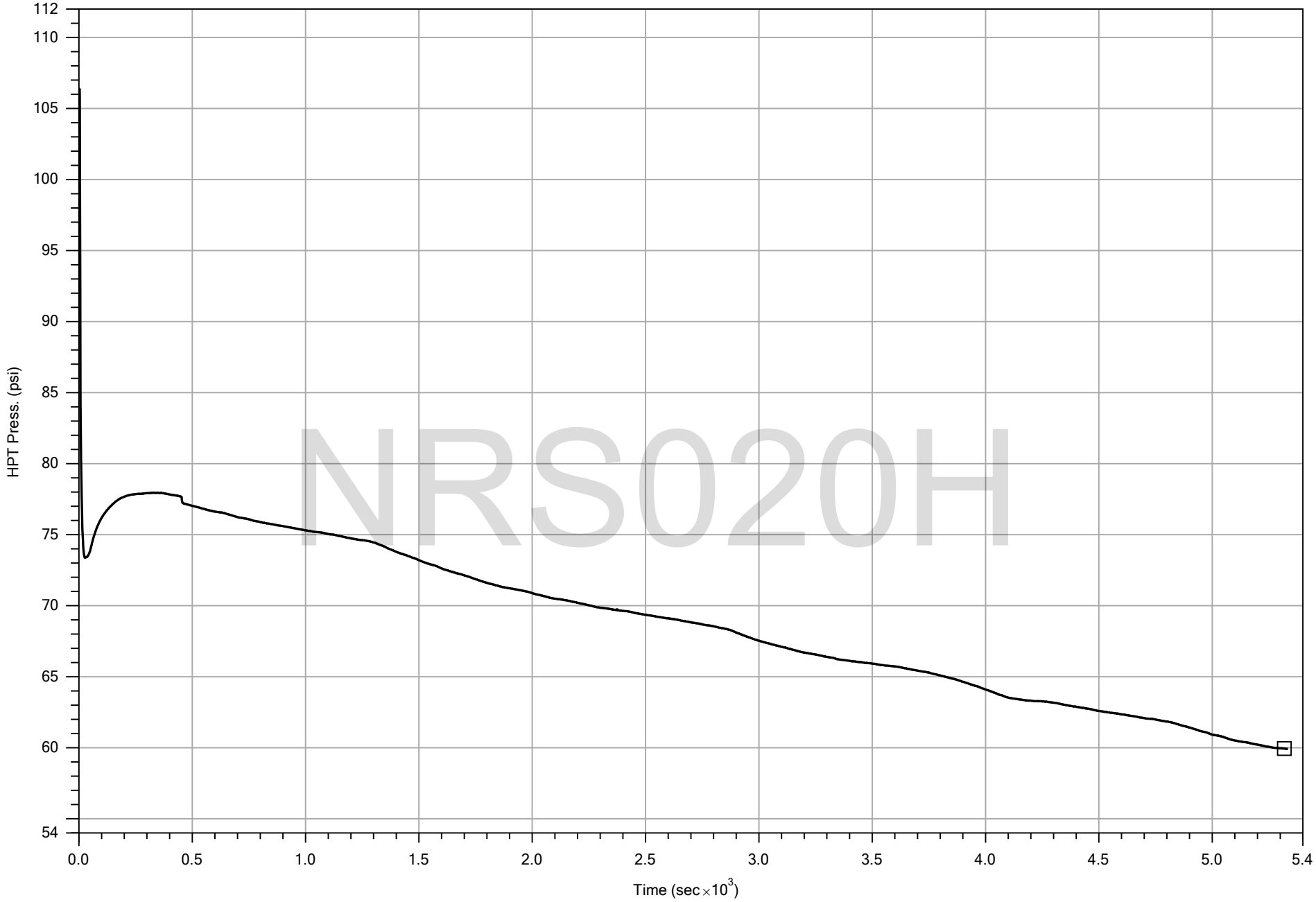
			File: NRS020H.DAT
Company: ZTS	Operator: RR		Date: 6/18/2015
Project ID: TVA	Client: AECOM		Location:



ZEBRA

HPT DISSIPATION (SINGLE CASE)

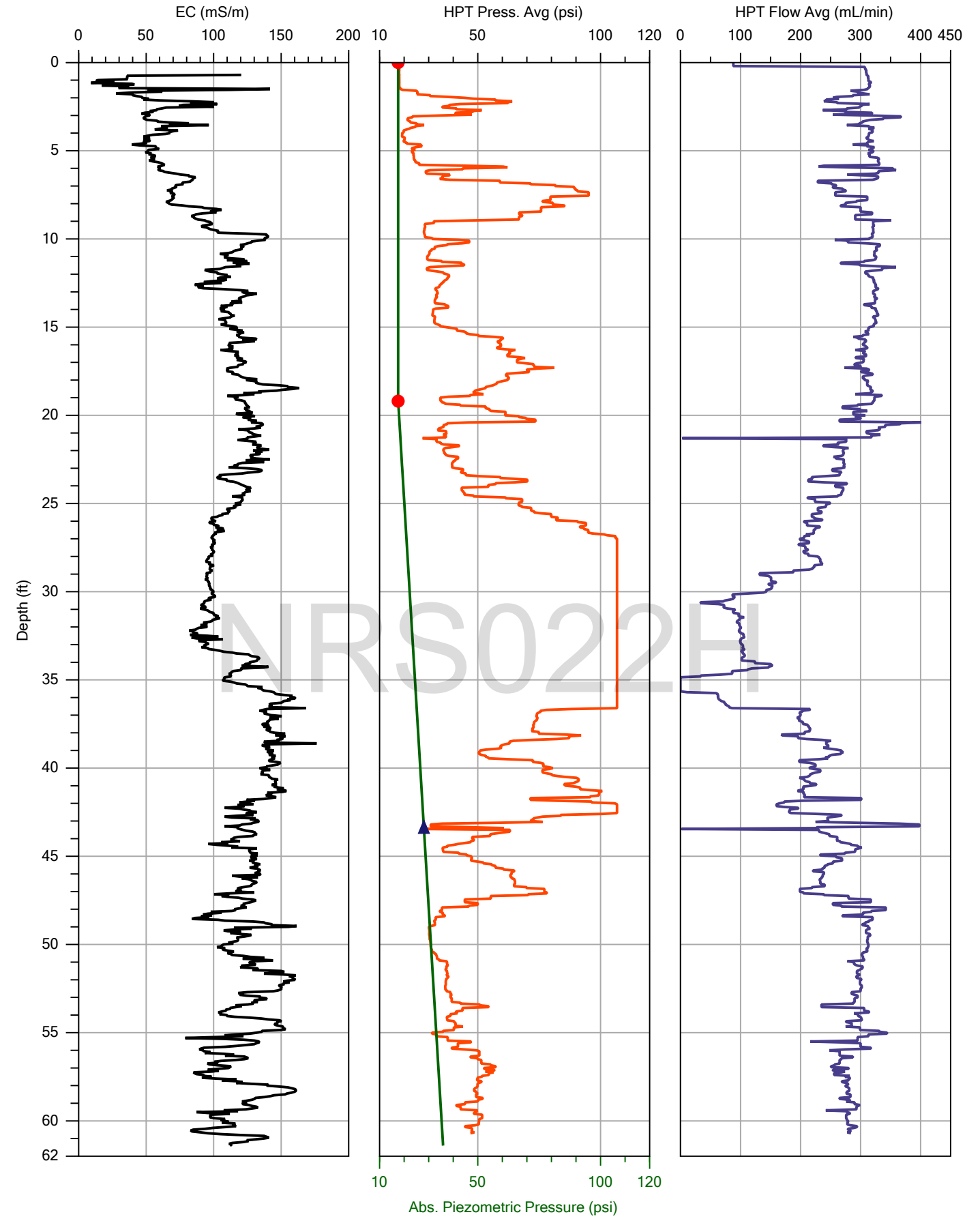
Company: ZTS	Operator: RR	File: NRS020H.DIS	Date: 6/18/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 27.70 ft	Test: 1



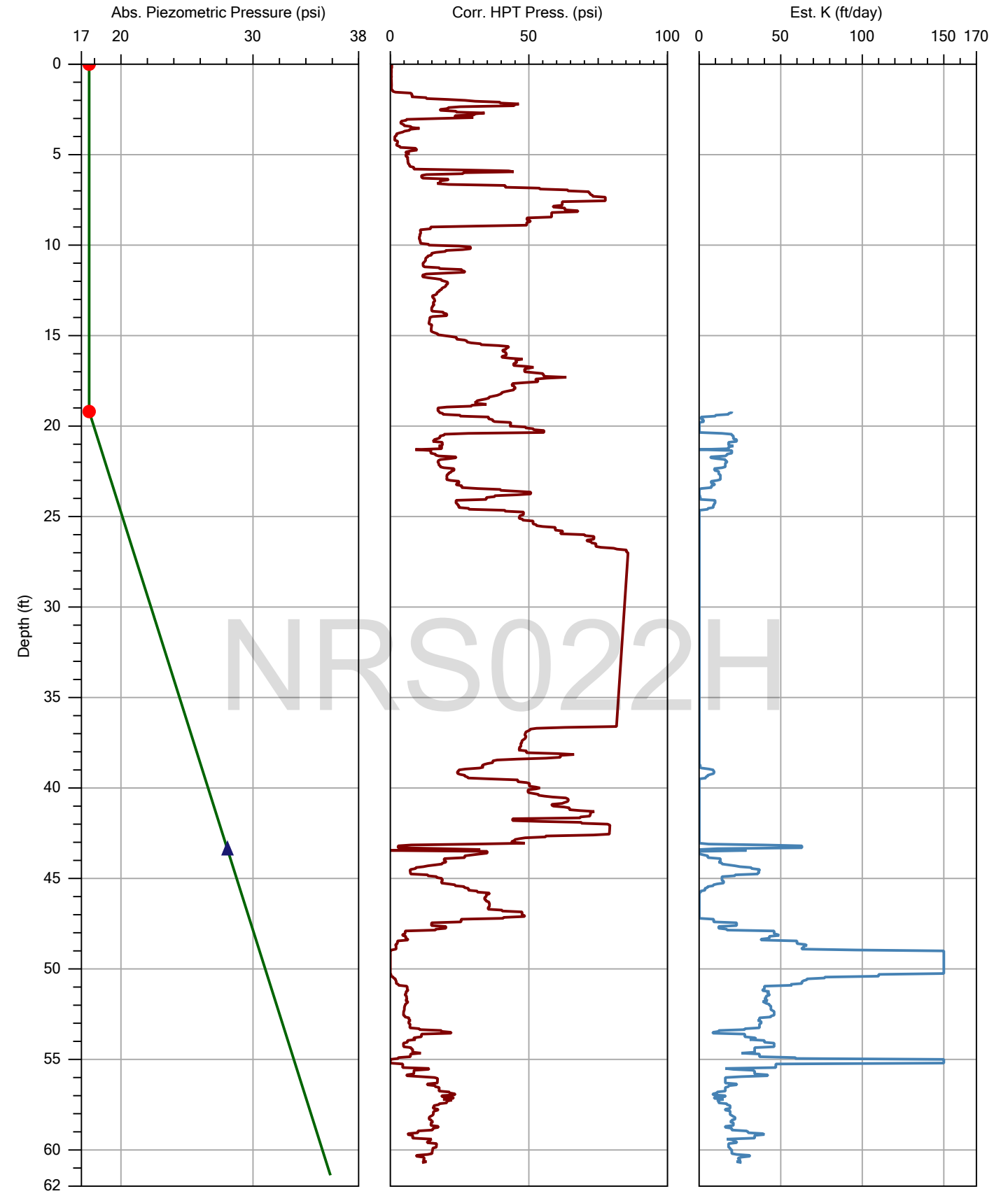
ZEBRA

HPT DISSIPATION (SINGLE CASE)

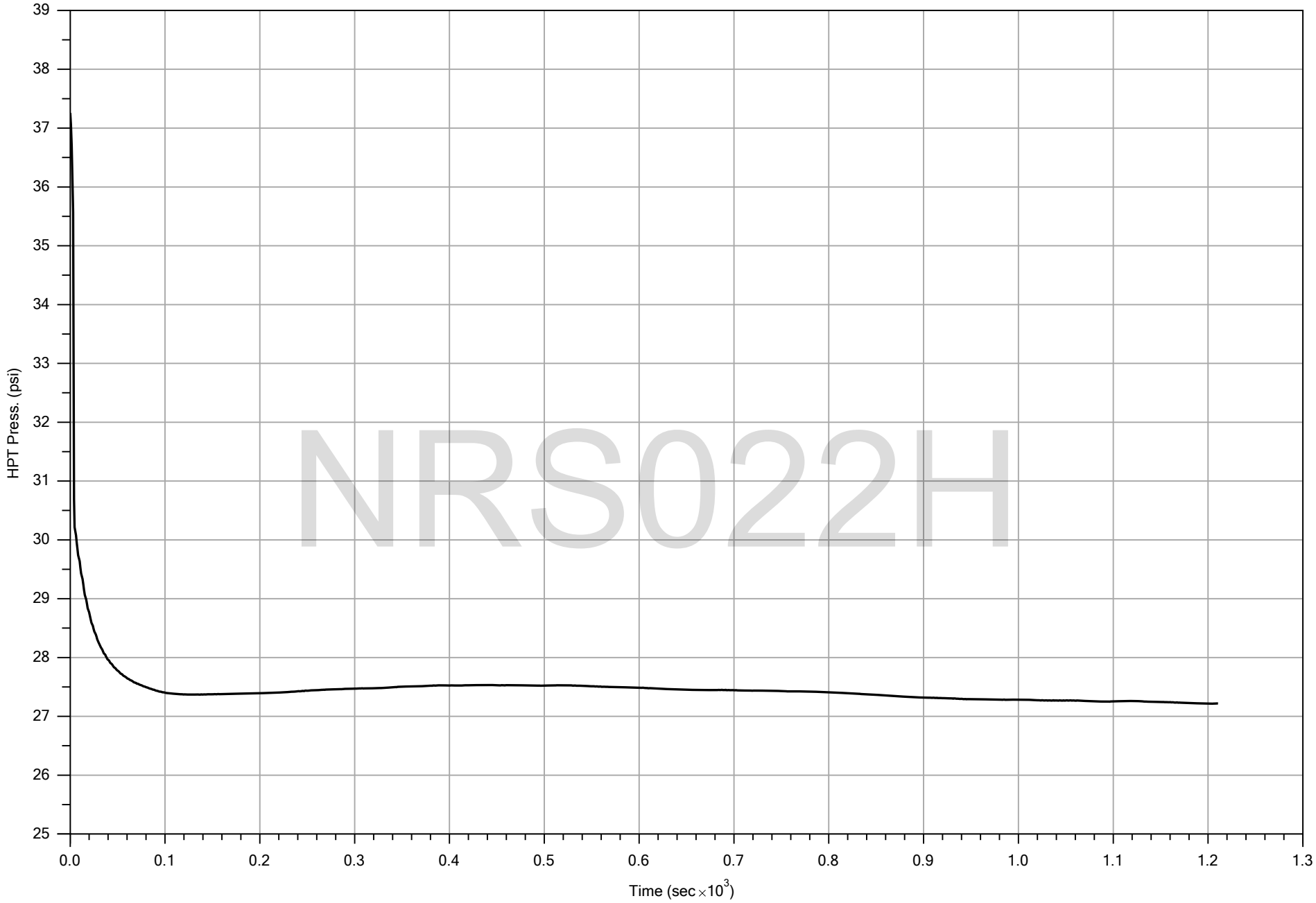
Company: ZTS	Operator: RR	File: NRS020H.DIS	Date: 6/18/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 55.65 ft	Test: 1



			File: NRS022H.DAT
Company: ZTS	Operator: RR		Date: 6/19/2015
Project ID: TVA	Client: AECOM		Location:

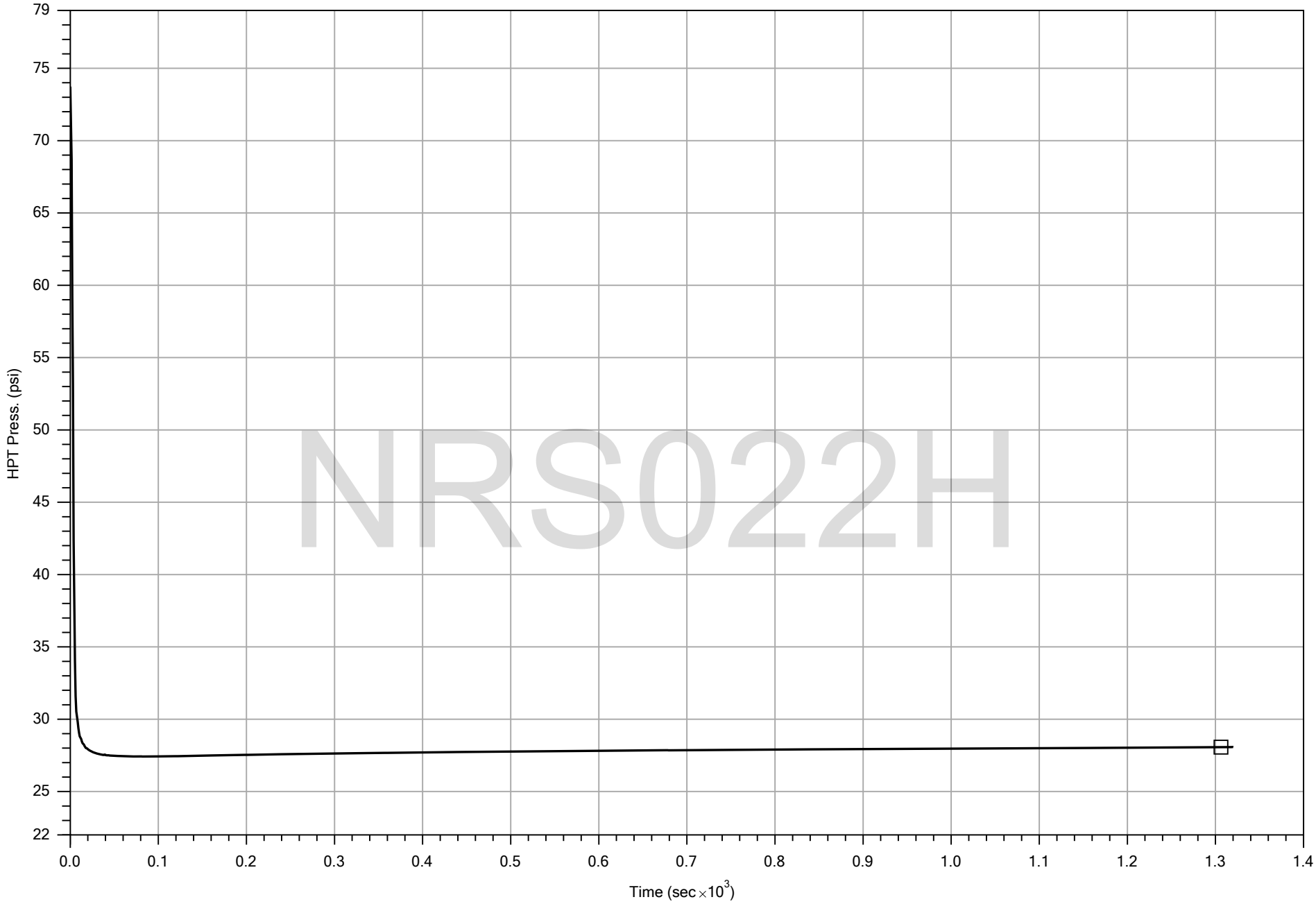


			File: NRS022H.DAT
Company: ZTS	Operator: RR		Date: 6/19/2015
Project ID: TVA	Client: AECOM		Location:



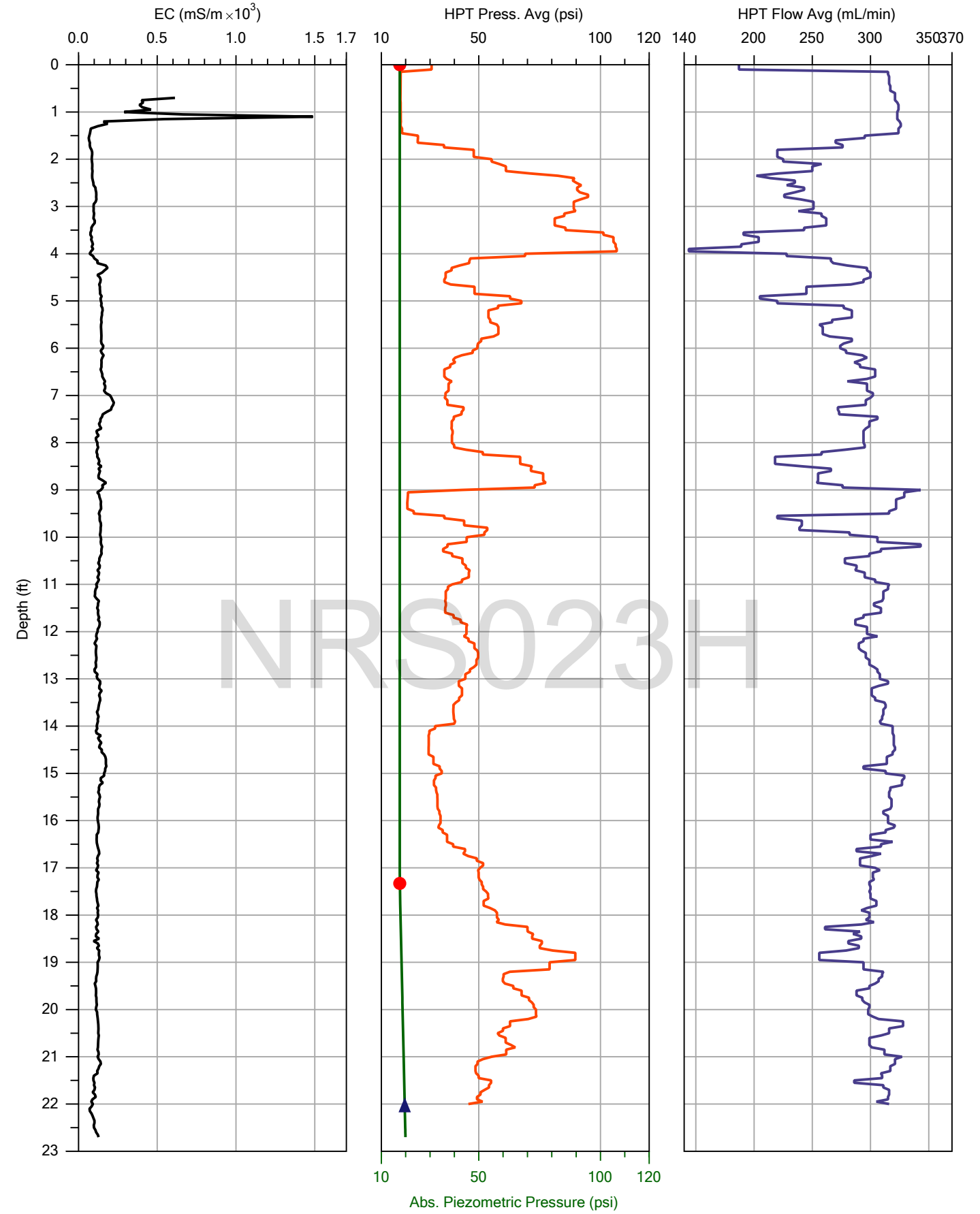
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 21.30 ft	Test: 1
		File: NRS022H.DIS	Date: 6/19/2015

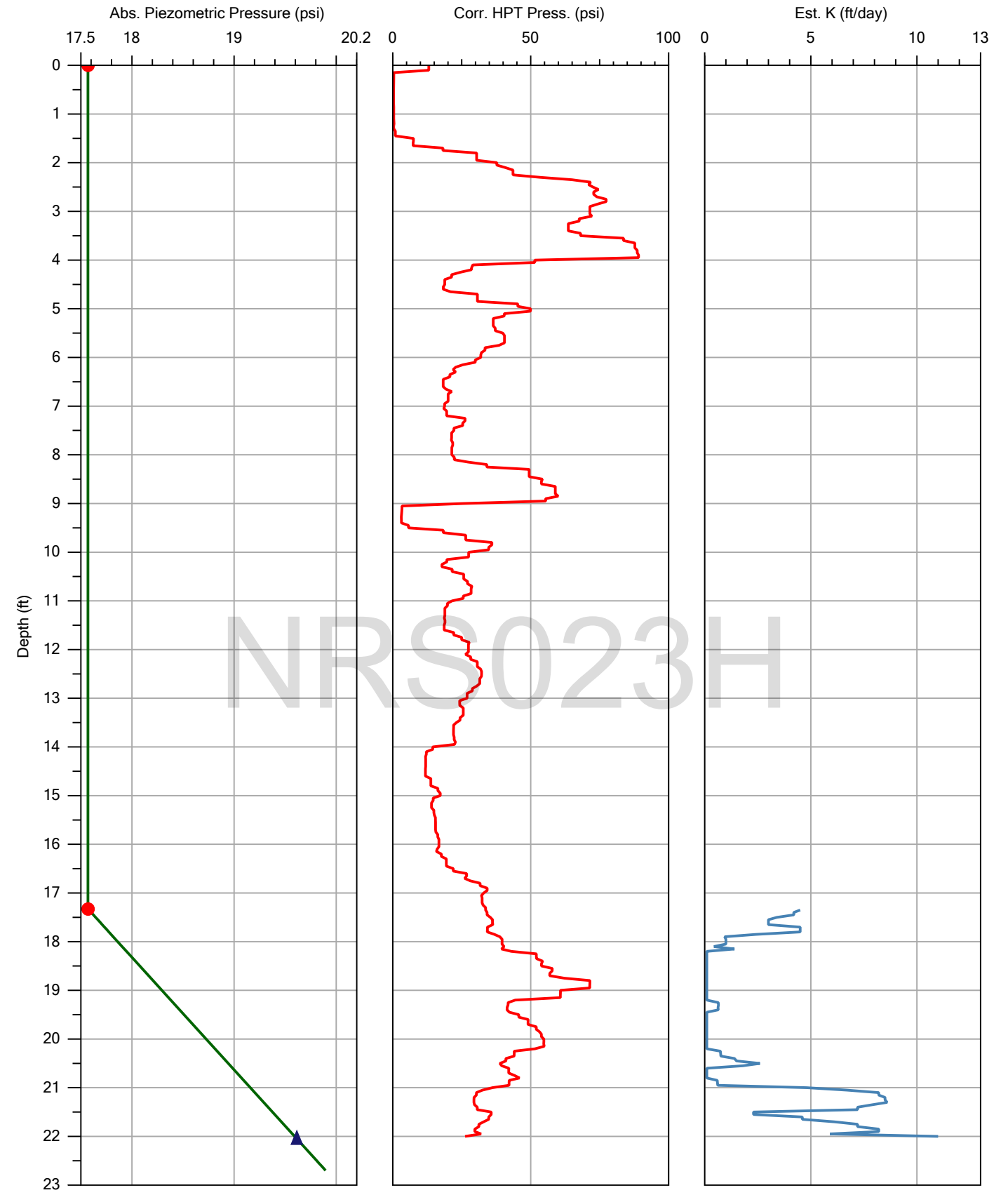


HPT DISSIPATION (SINGLE CASE)

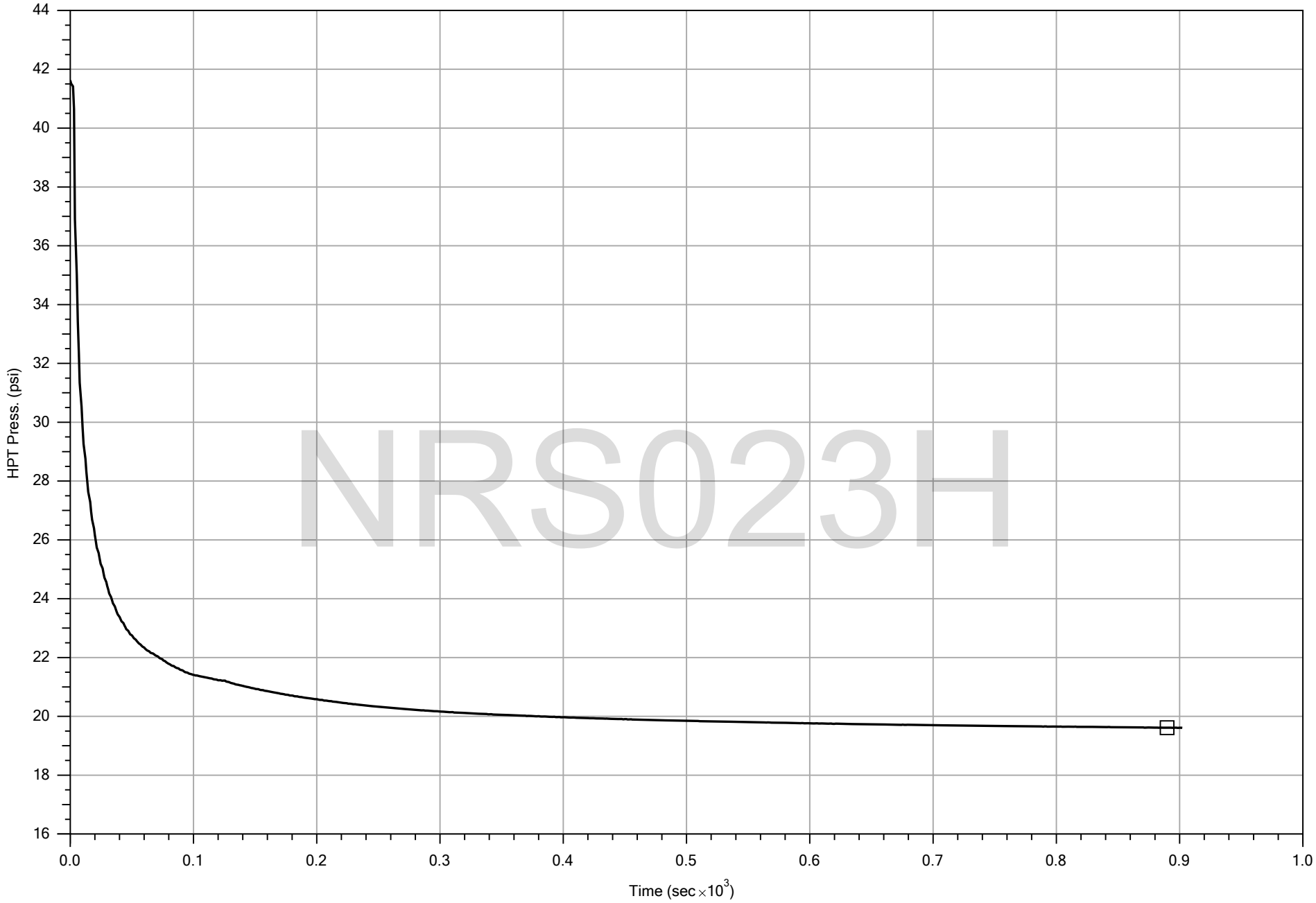
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 43.40 ft	Test: 1
		File: NRS022H.DIS	Date: 6/19/2015



			File: NRS023H.DAT
Company: ZTS	Operator: RR		Date: 6/19/2015
Project ID: TVA	Client: AECOM		Location:

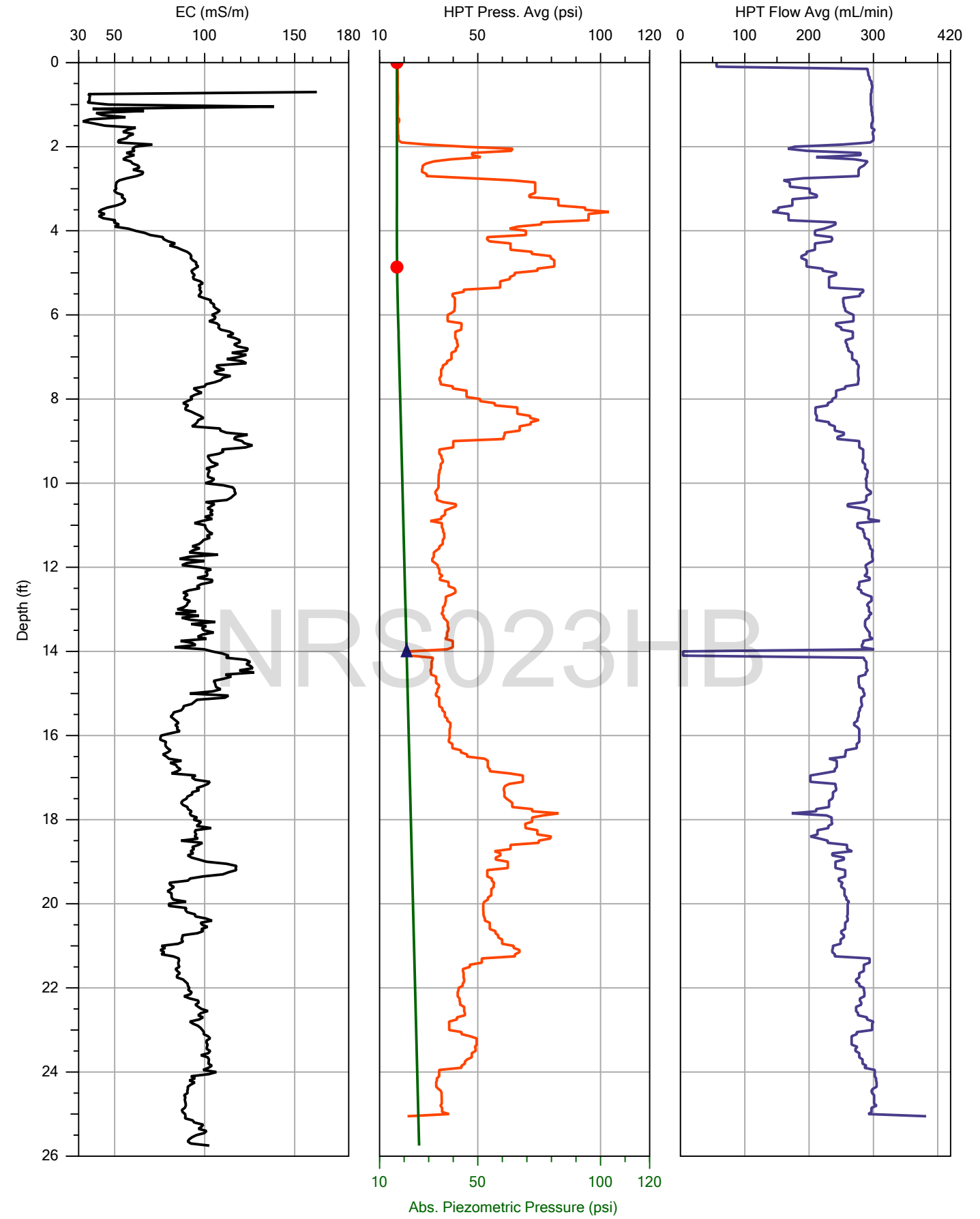


			File: NRS023H.DAT
Company: ZTS	Operator: RR		Date: 6/19/2015
Project ID: TVA	Client: AECOM		Location:

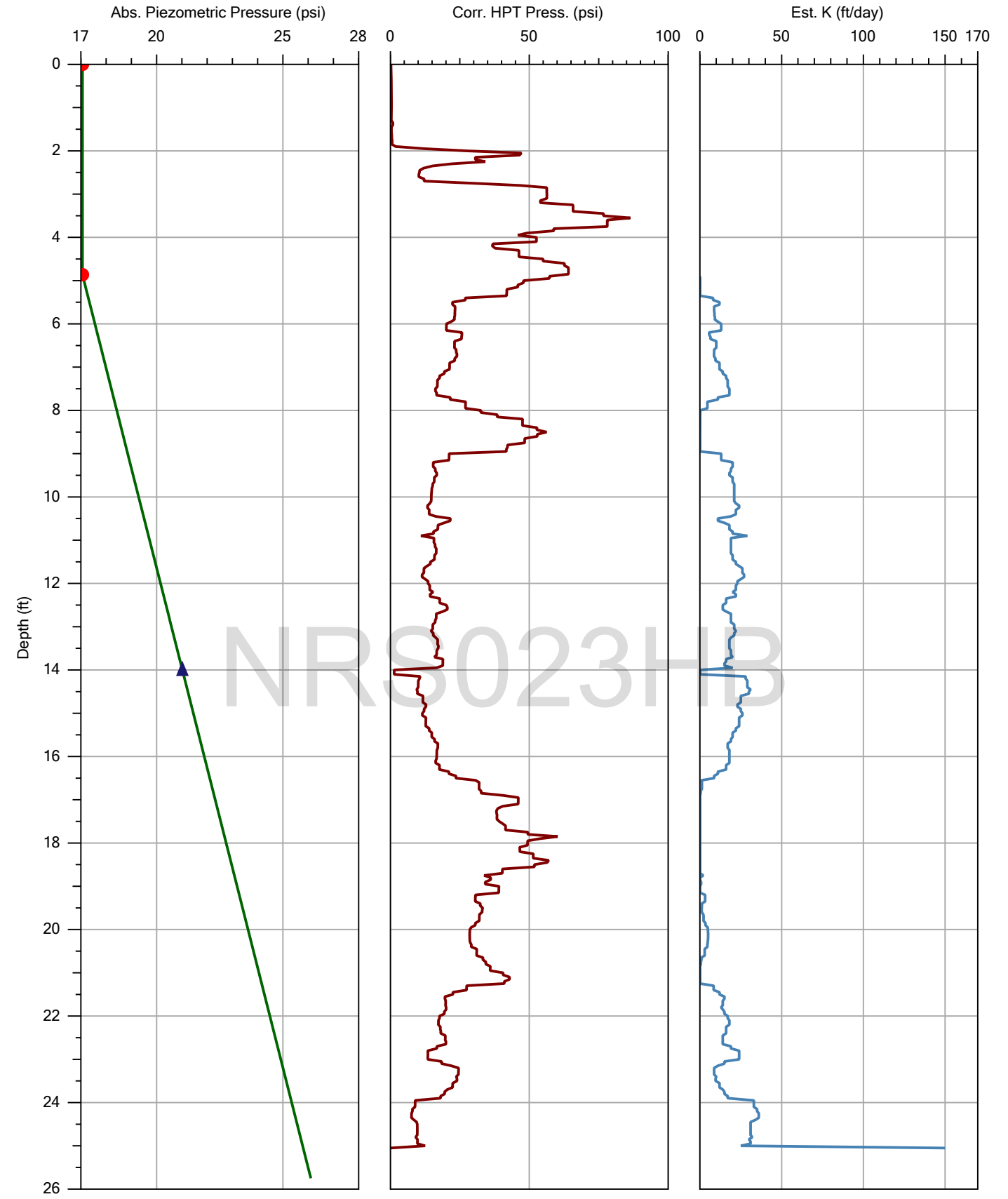


HPT DISSIPATION (SINGLE CASE)

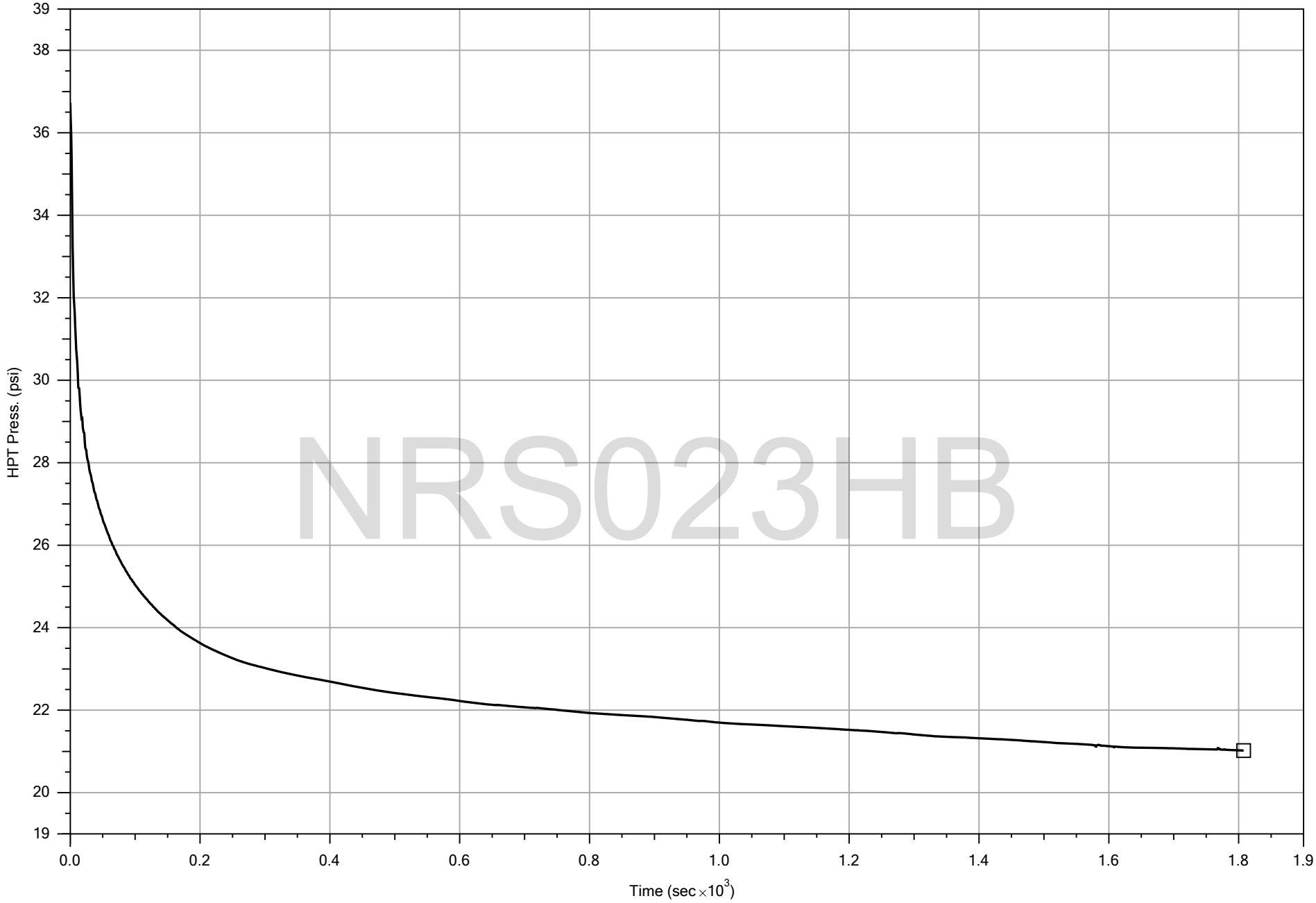
Company: ZTS	Operator: RR	Location:	File: NRS023H.DIS
Project ID: TVA	Client: AECOM	Depth: 22.05 ft	Date: 6/19/2015
			Sensor: HPT Press.
			Test: 1



			File: NRS023HB.DAT
Company: ZEBRA		Operator: RR	Date: 6/22/2015
Project ID: TVA		Client: AECOM	Location:



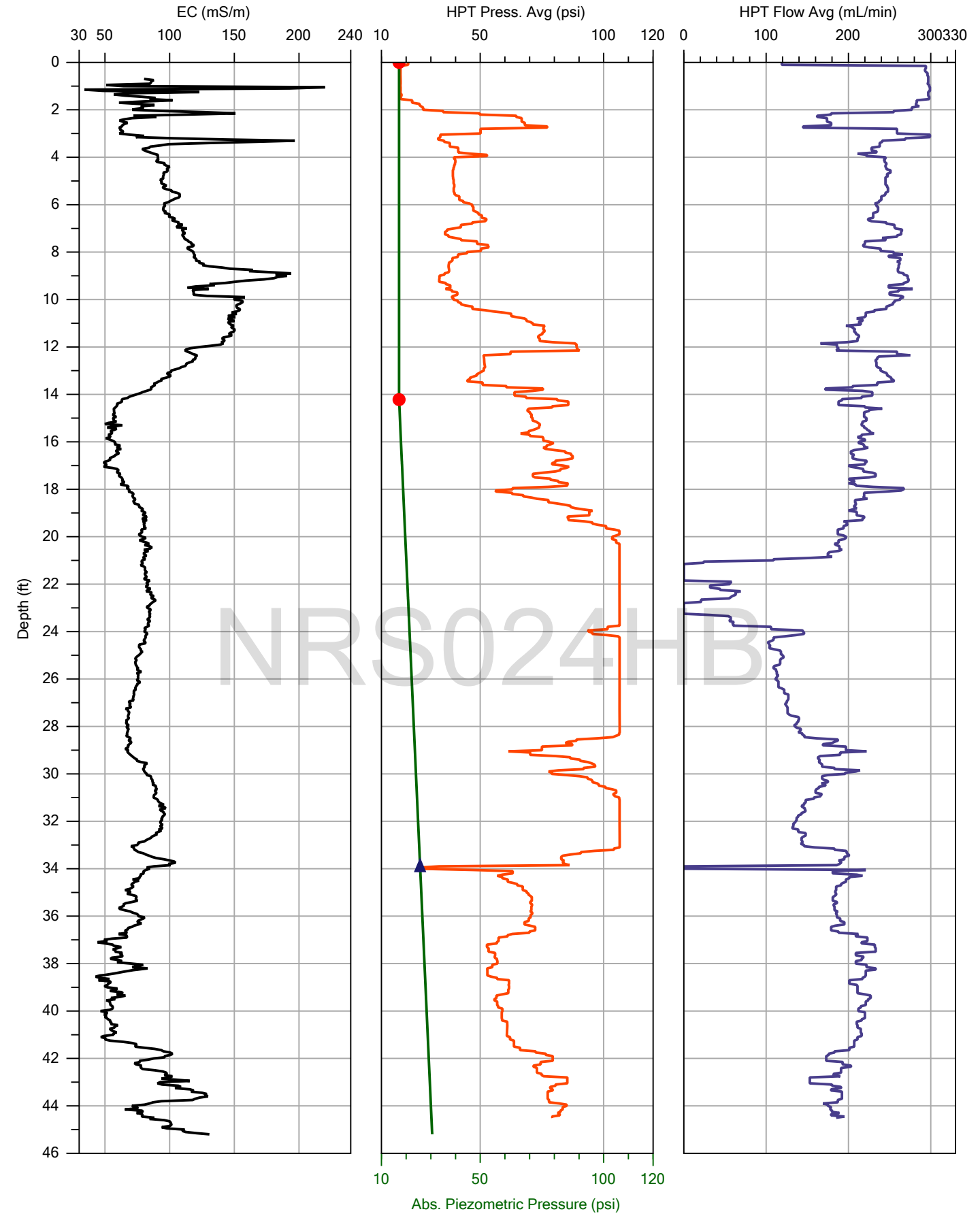
			File: NRS023HB.DAT
Company: ZEBRA	Operator: RR		Date: 6/22/2015
Project ID: TVA	Client: AECOM		Location:



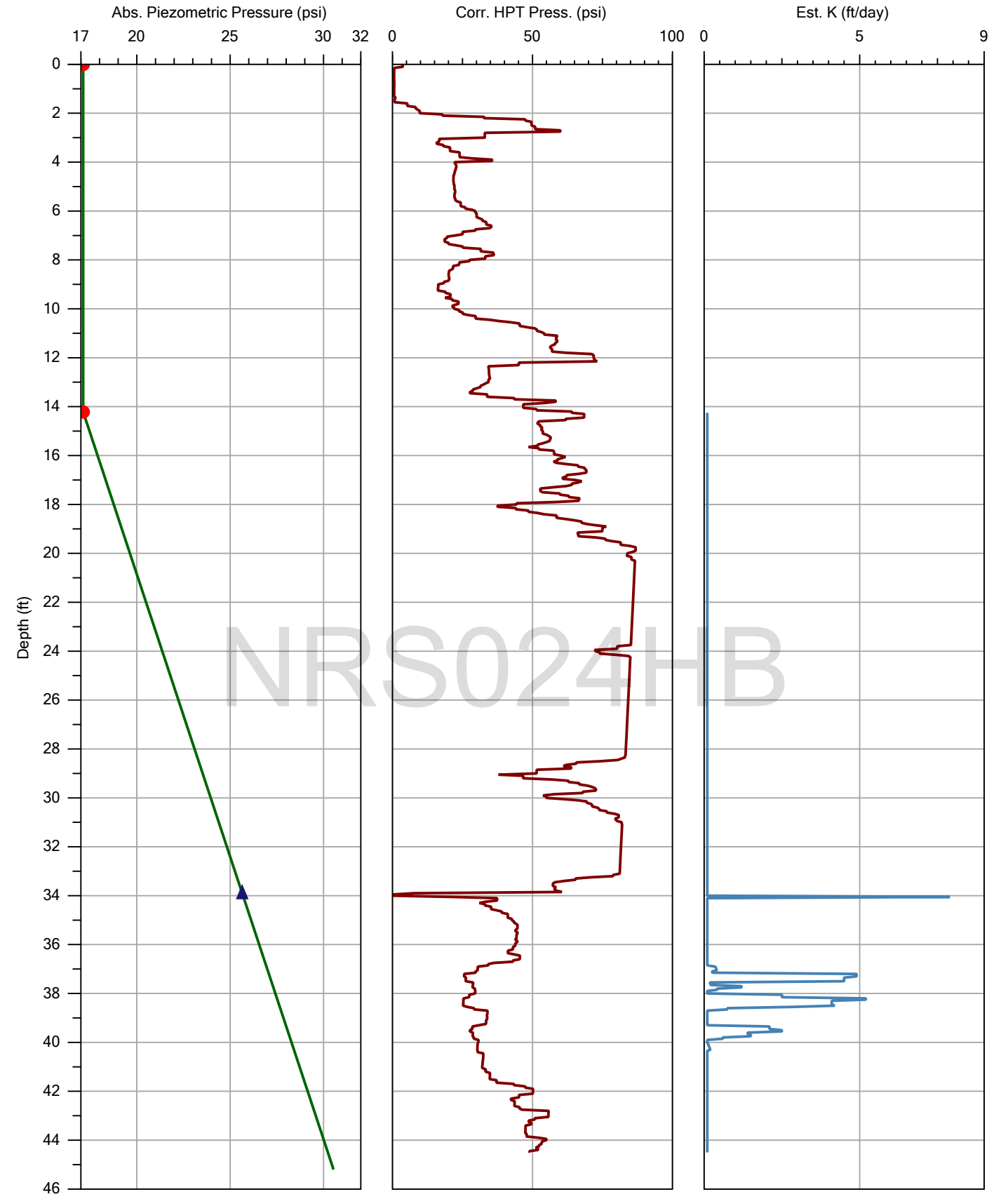
ZEBRA

HPT DISSIPATION (SINGLE CASE)

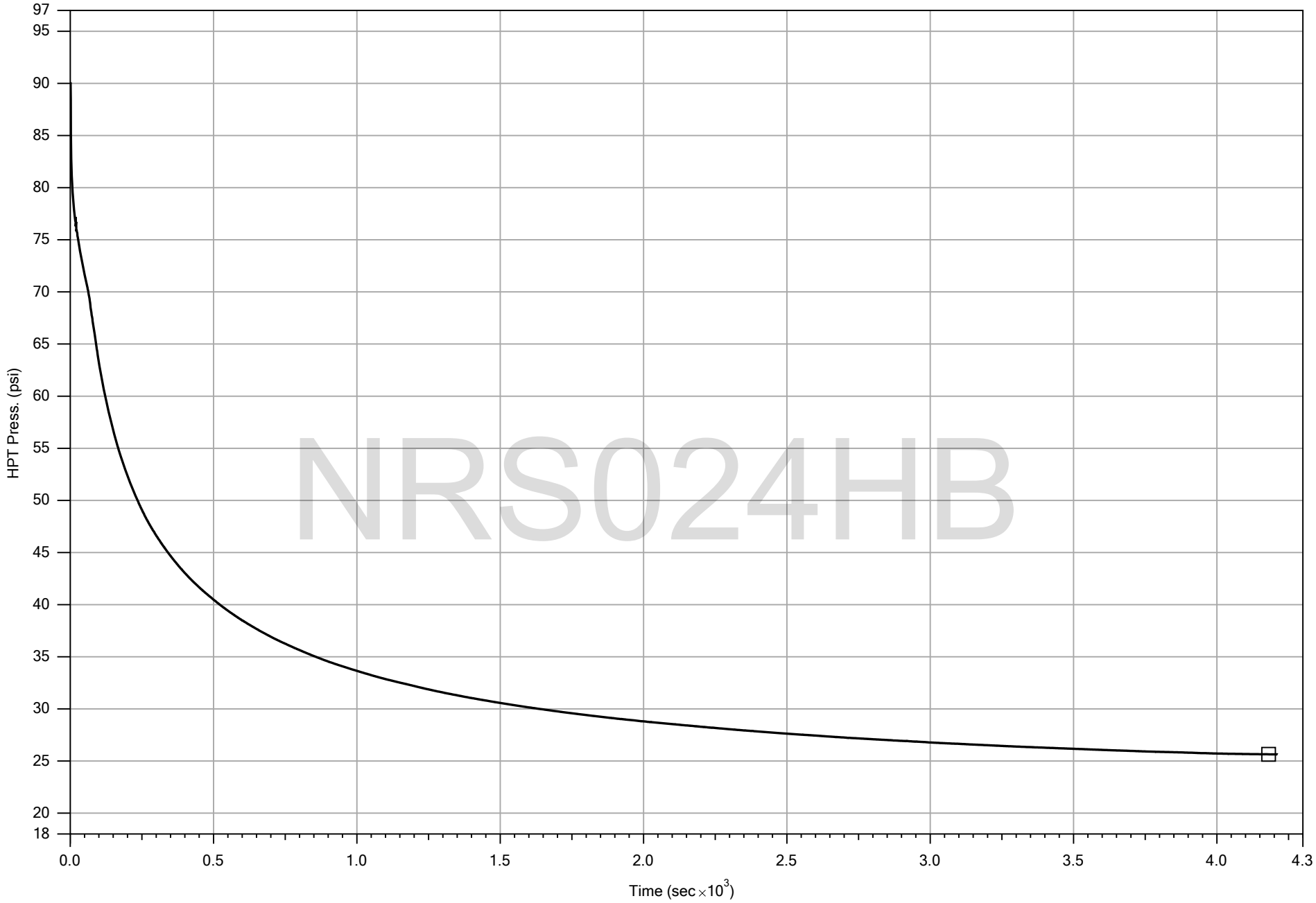
Company: ZEBRA	Operator: RR	File: NRS023HB.DIS	Date: 6/22/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 14.00 ft	Test: 1



			File: NRS024H.DAT
Company: ZEBRA		Operator: RR	Date: 6/22/2015
Project ID: TVA		Client: AECOM	Location:

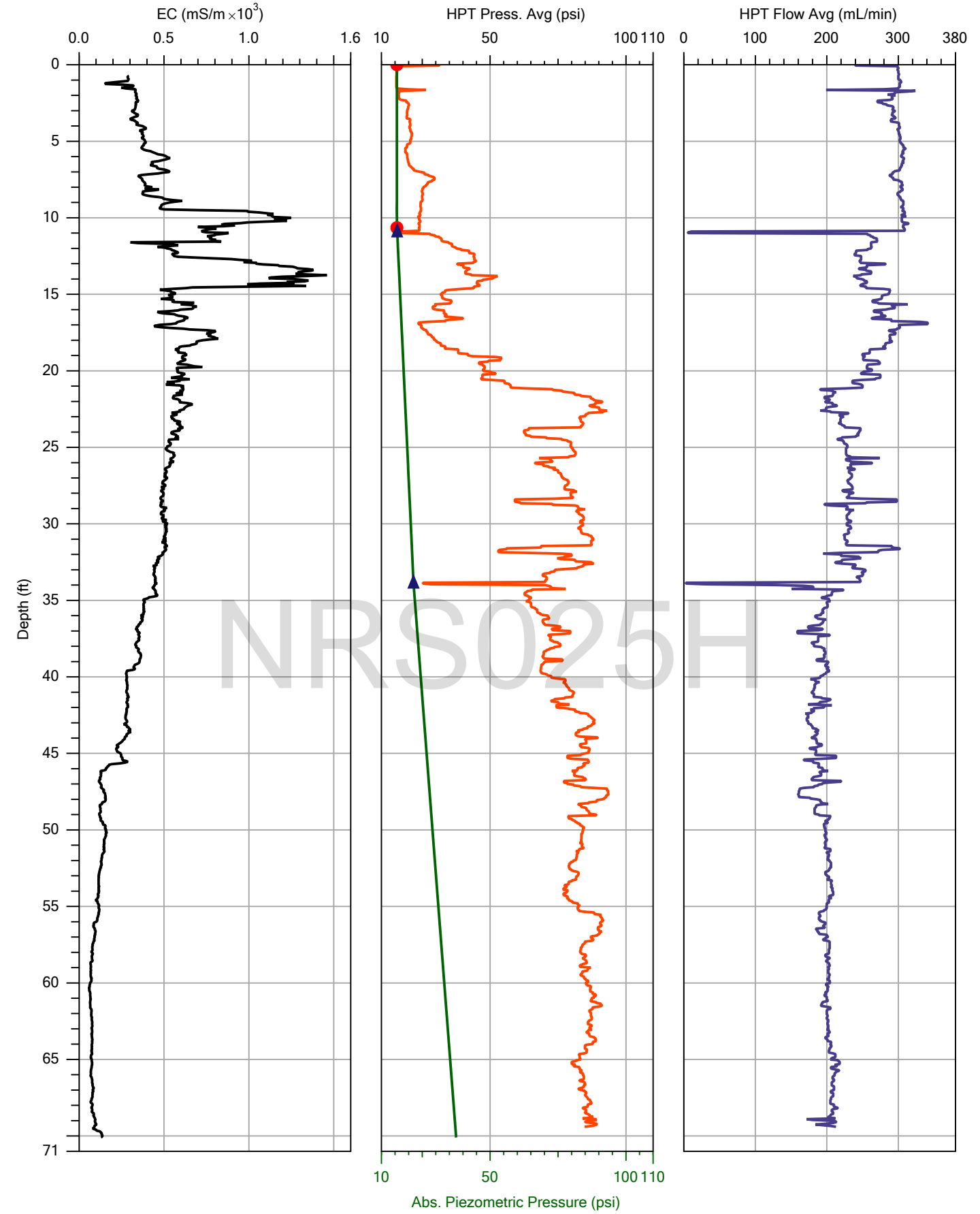


			File: NRS024H.DAT
Company: ZEBRA		Operator: RR	Date: 6/22/2015
Project ID: TVA		Client: AECOM	Location:

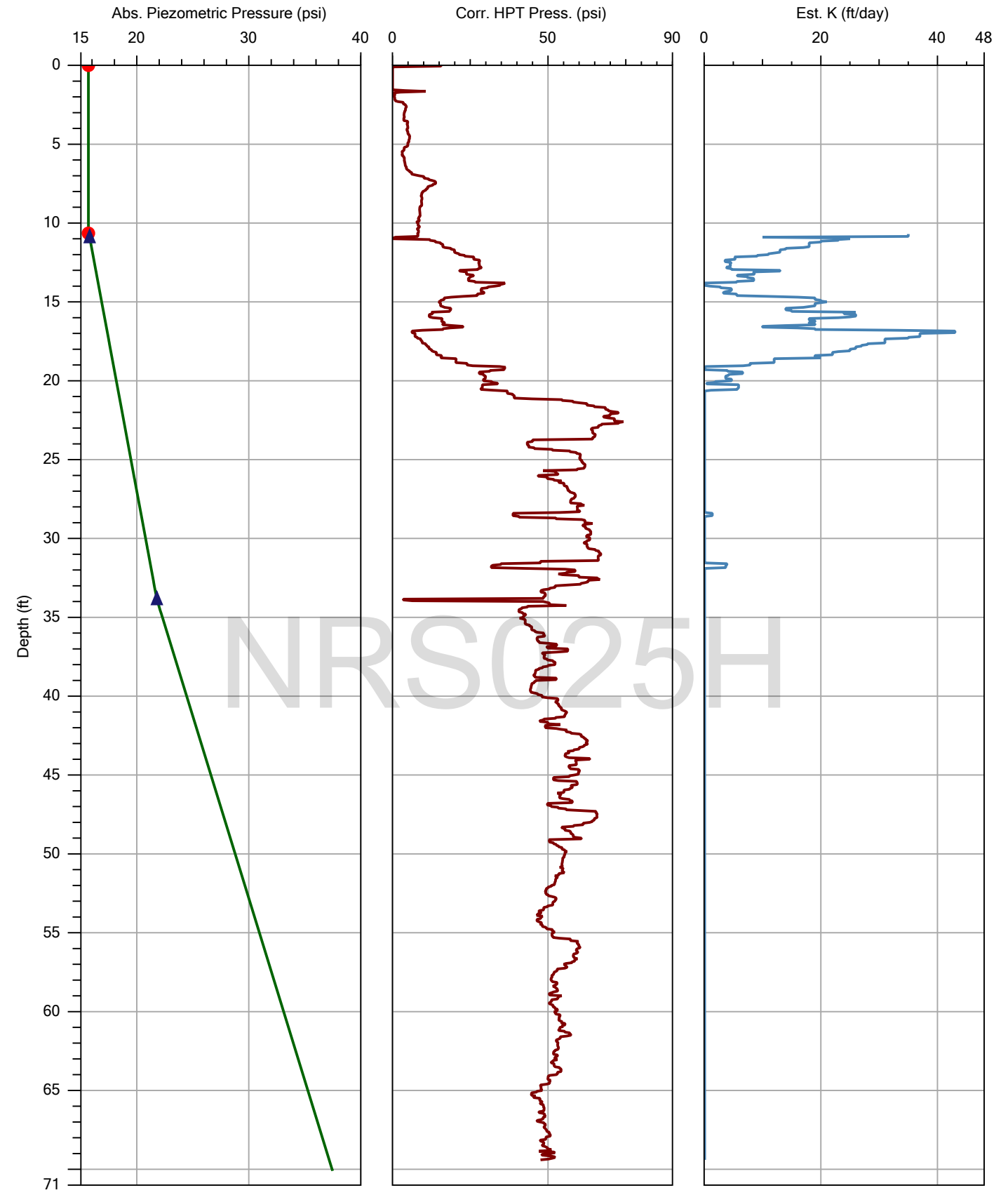


HPT DISSIPATION (SINGLE CASE)

Company: ZEBRA	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 33.90 ft	Test: 1
		File: NRS024H.DIS	Date: 6/22/2015



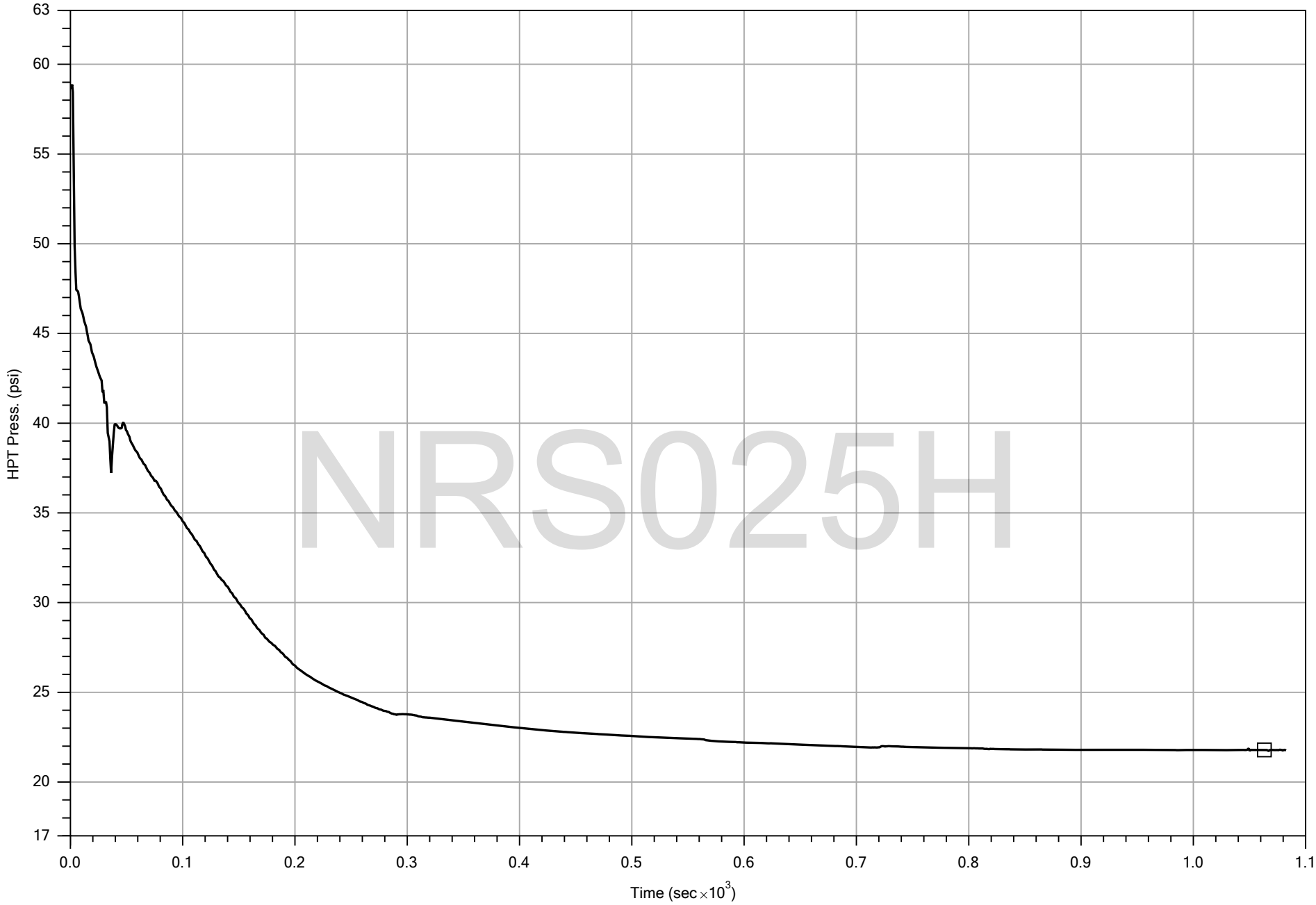
			File: NRS025H.DAT
Company: ZTS	Operator: RR		Date: 6/23/2015
Project ID: TVA	Client: AECOM		Location:



			File: NRS025H.DAT
Company: ZTS	Operator: RR		Date: 6/23/2015
Project ID: TVA	Client: AECOM		Location:

HPT DISSIPATION (SINGLE CASE)

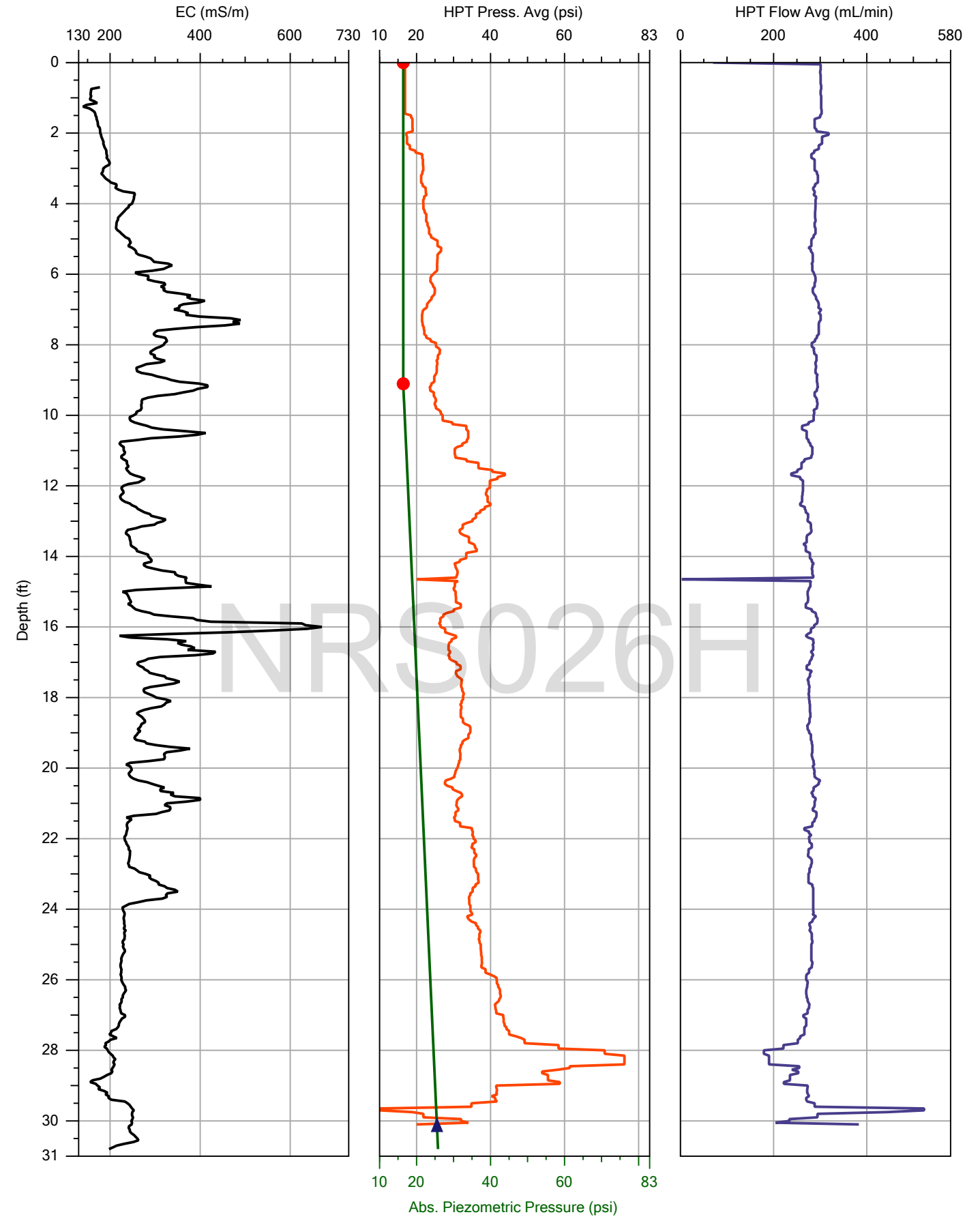
Company: ZTS	Operator: RR	File: NRS025H.DIS	Date: 6/23/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 10.90 ft	Test: 1



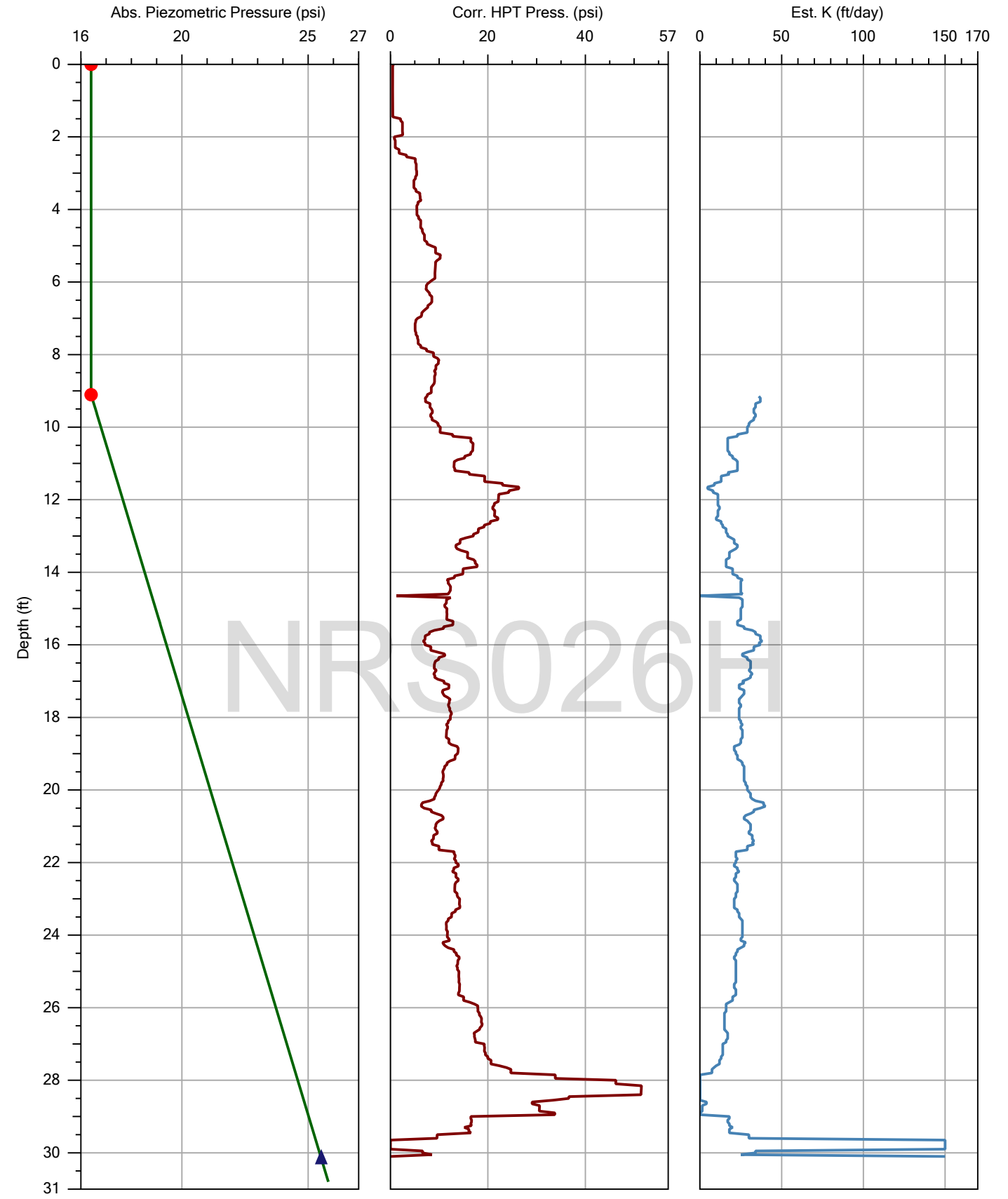
ZEBRA

HPT DISSIPATION (SINGLE CASE)

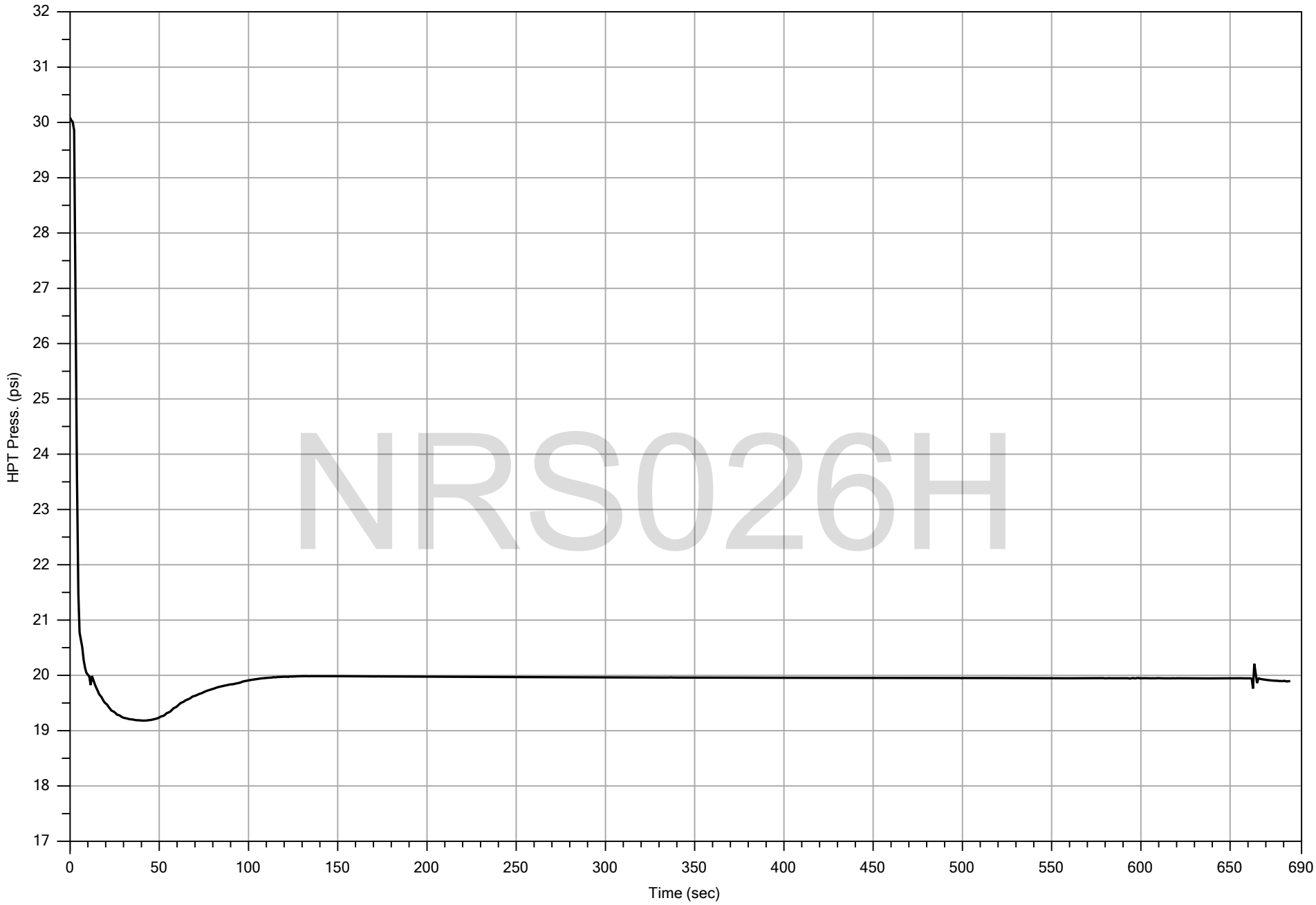
Company: ZTS	Operator: RR	File: NRS025H.DIS	Date: 6/23/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 33.85 ft	Test: 1



		File: NRS026H.DAT
Company: ZTS	Operator: RR	Date: 6/23/2015
Project ID: TVA	Client: AECOM	Location:

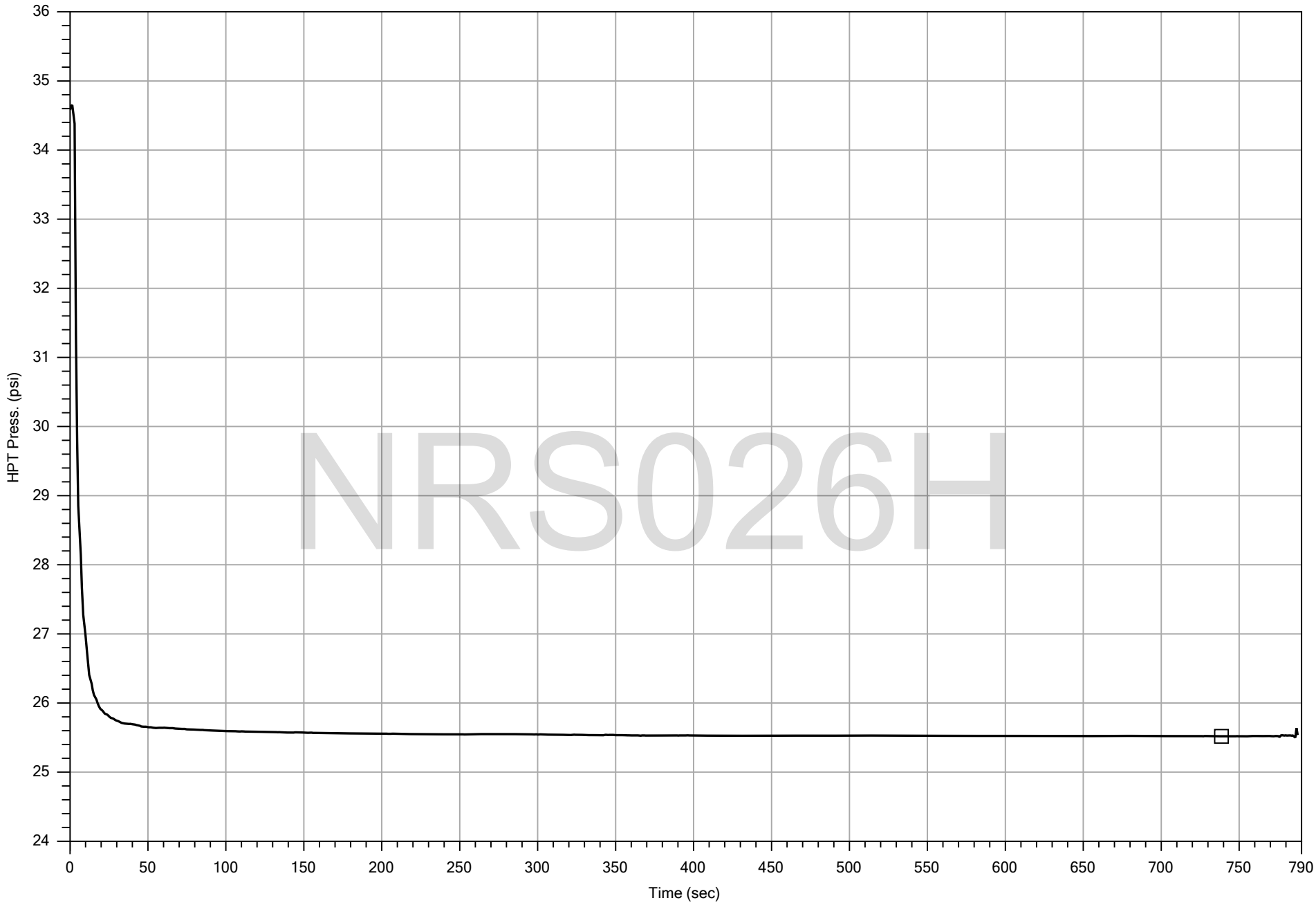


			File: NRS026H.DAT
Company: ZTS	Operator: RR		Date: 6/23/2015
Project ID: TVA	Client: AECOM		Location:



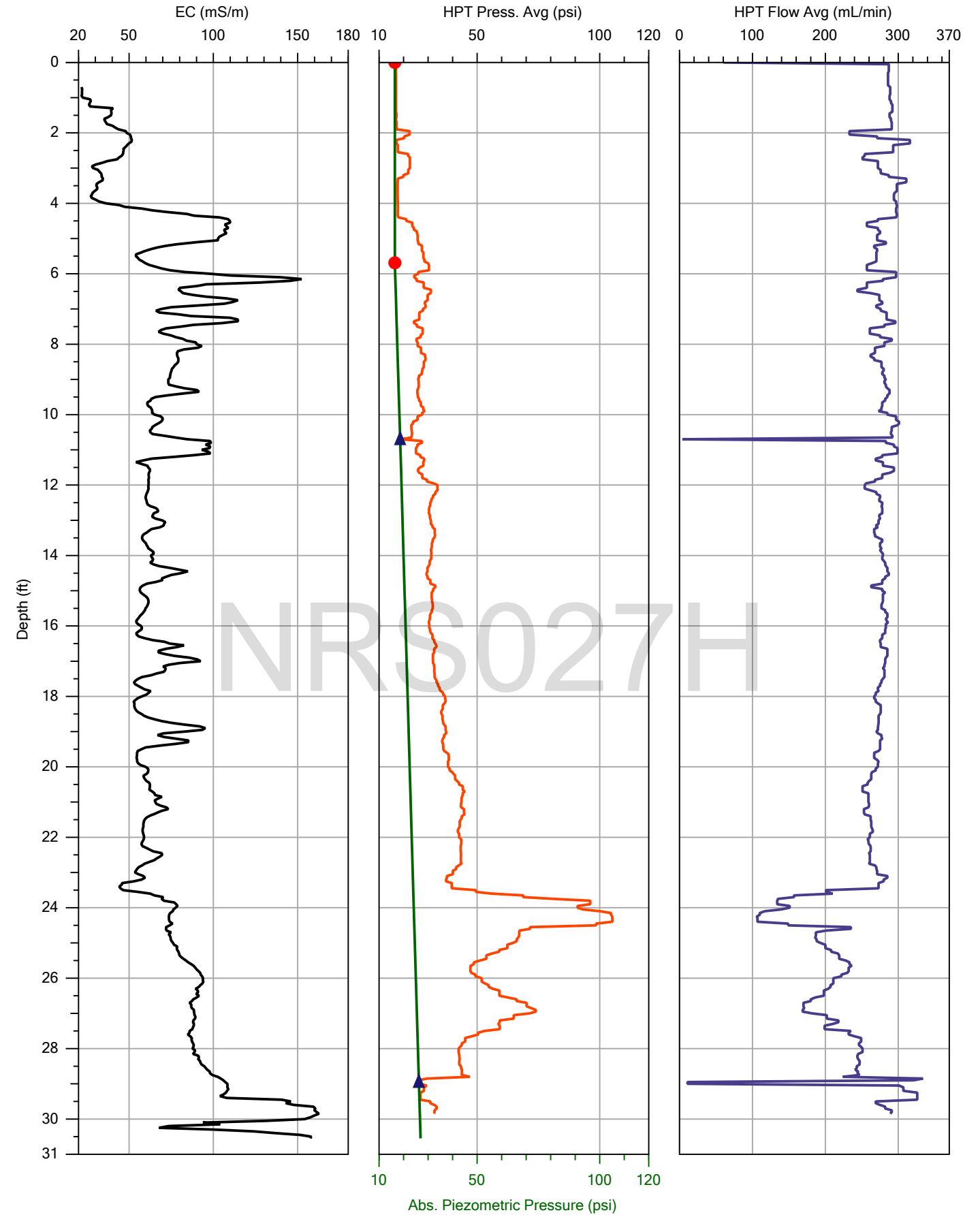
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 14.65 ft	Test: 1
		File: NRS026H.DIS	Date: 6/23/2015

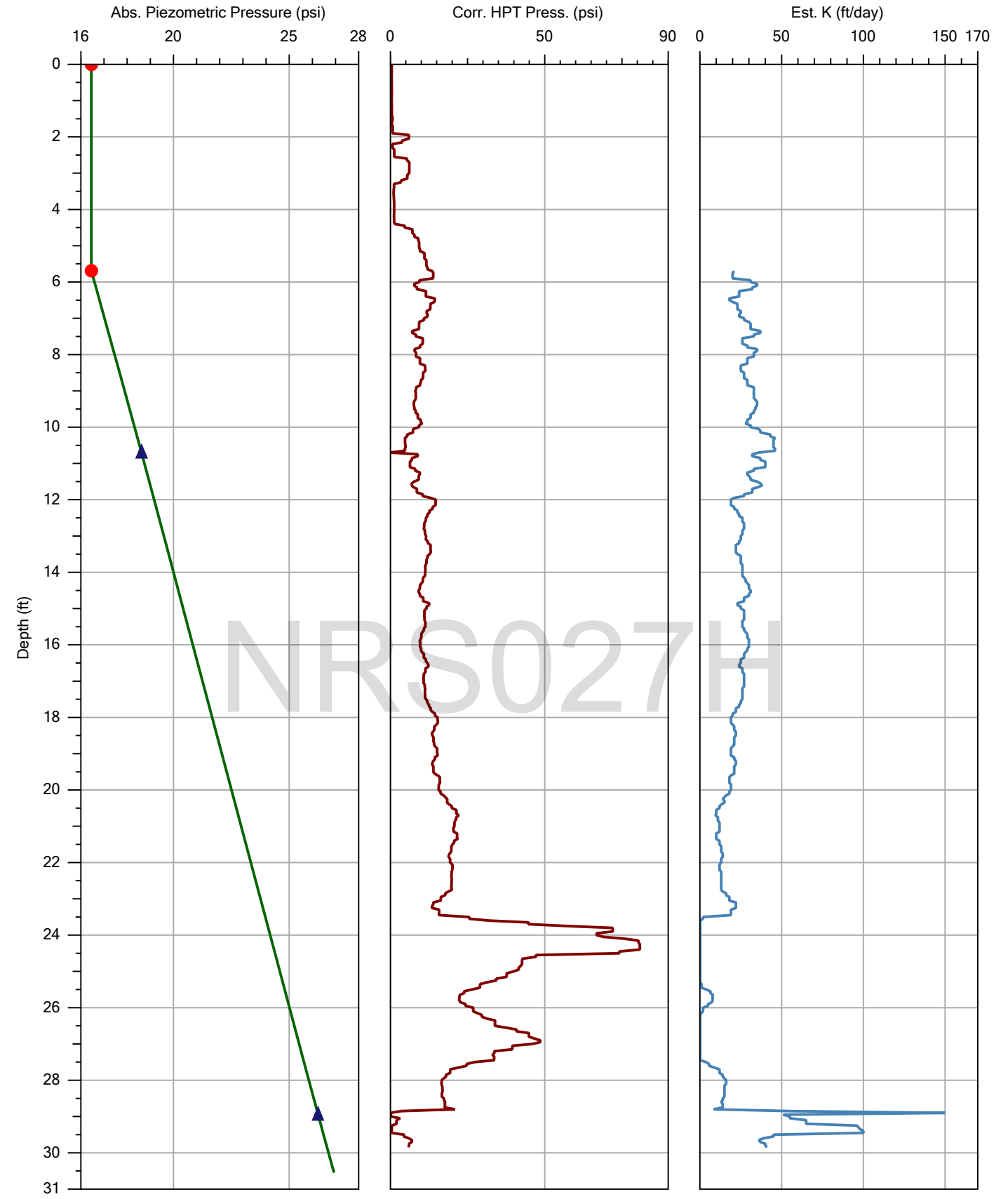


HPT DISSIPATION (SINGLE CASE)

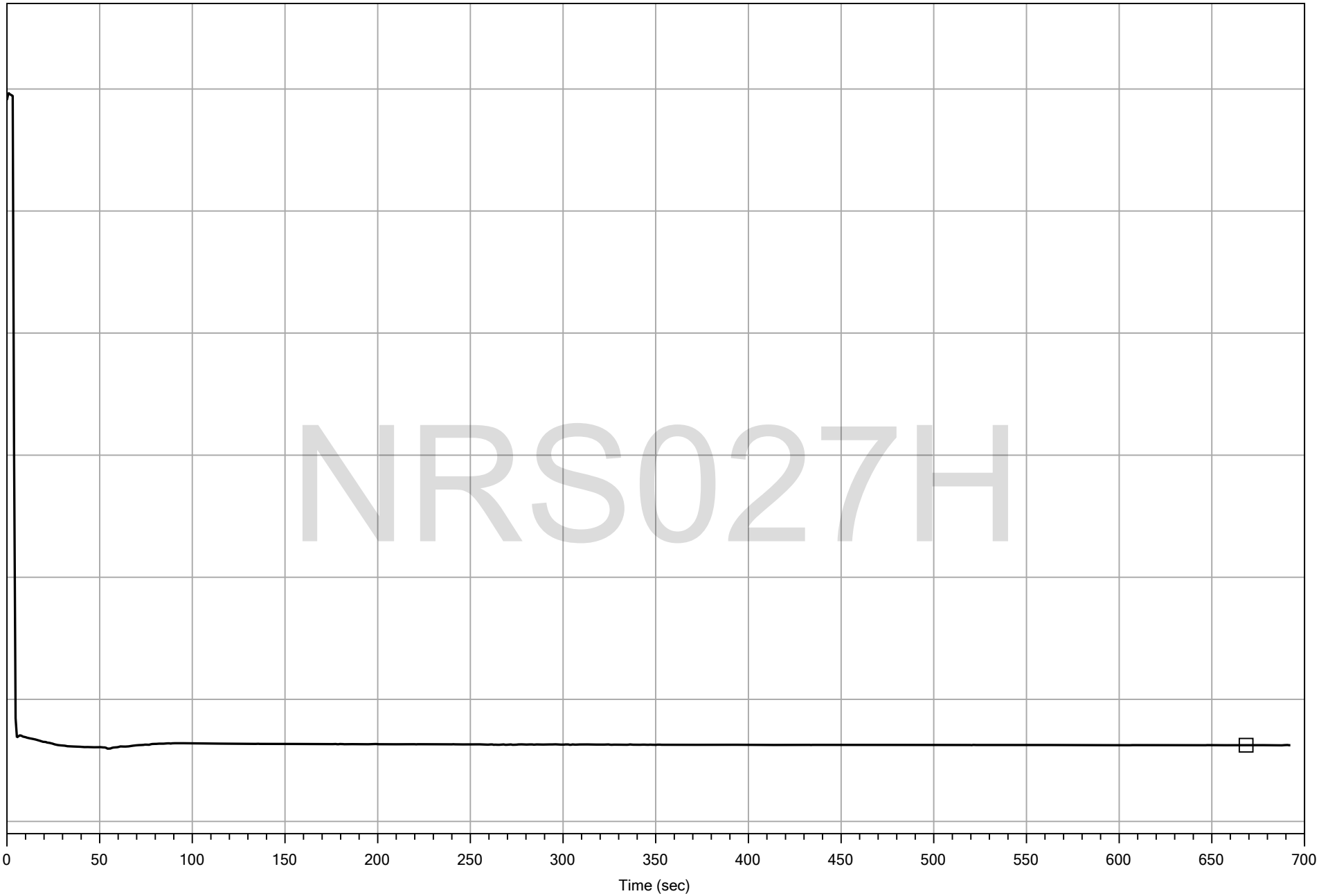
Company: ZTS	Operator: RR	File: NRS026H.DIS	Date: 6/23/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 30.15 ft	Test: 1



			File: NRS027H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:

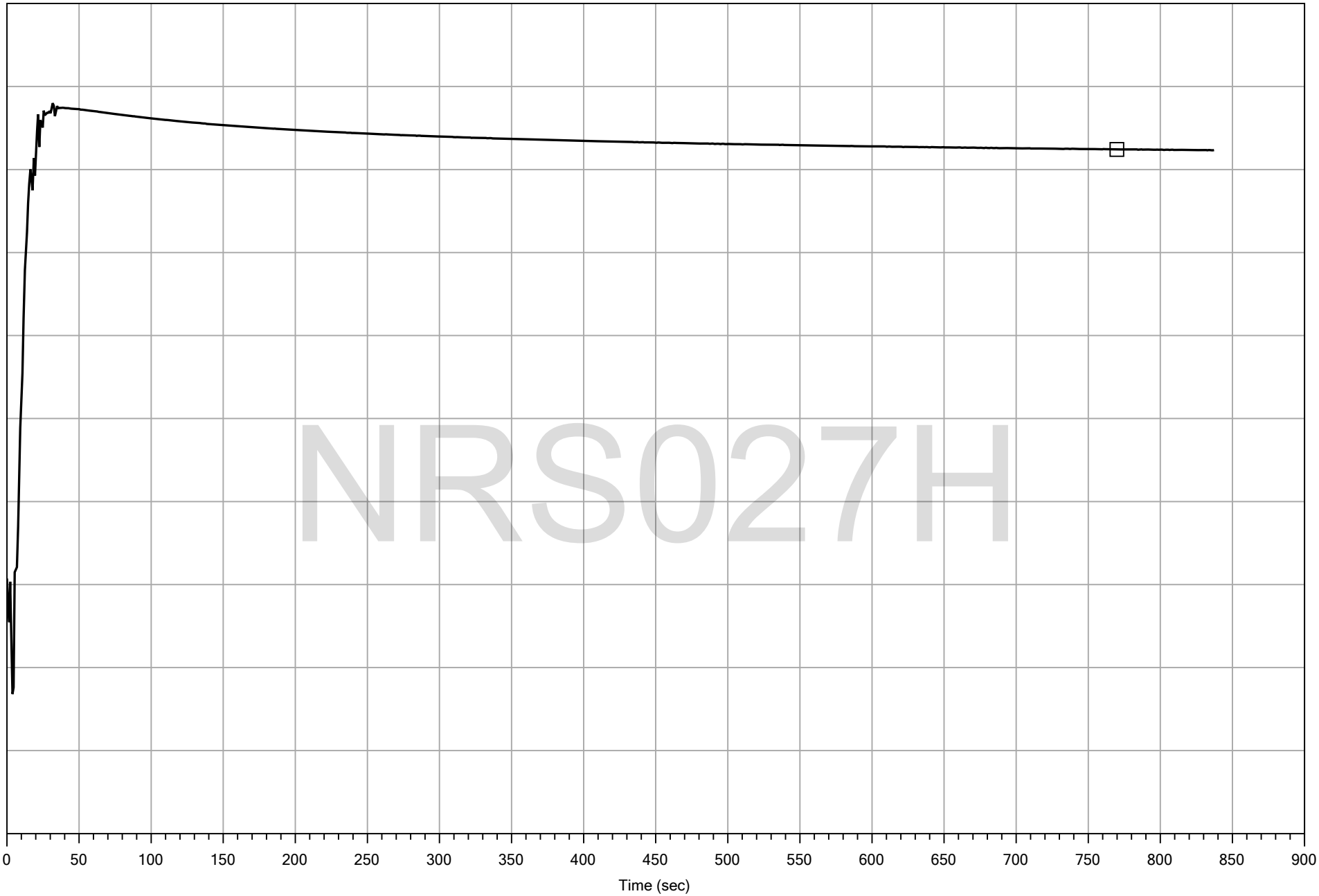


			File: NRS027H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:



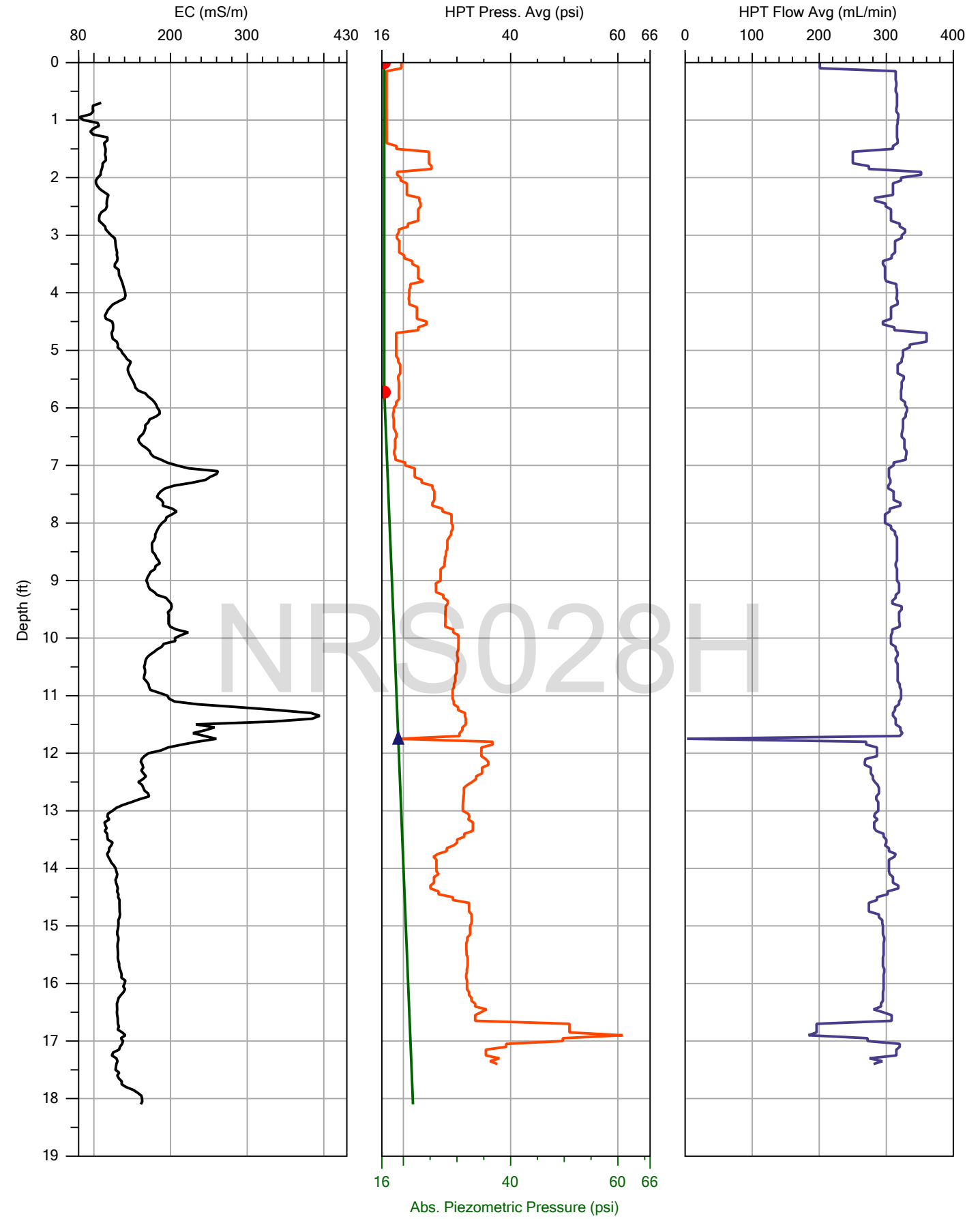
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS027H.DIS	Date: 6/24/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 10.70 ft	Test: 1

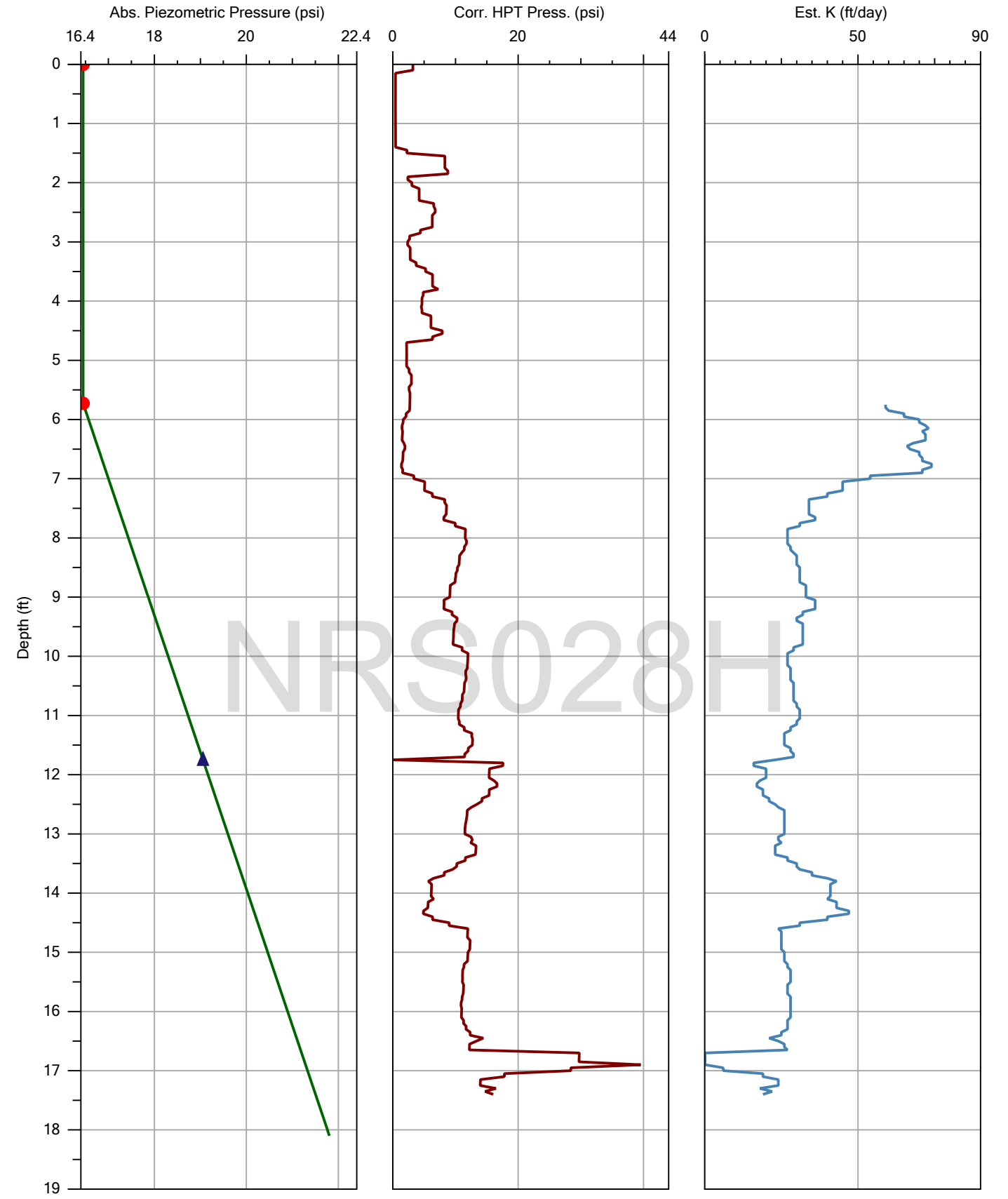


HPT DISSIPATION (SINGLE CASE)

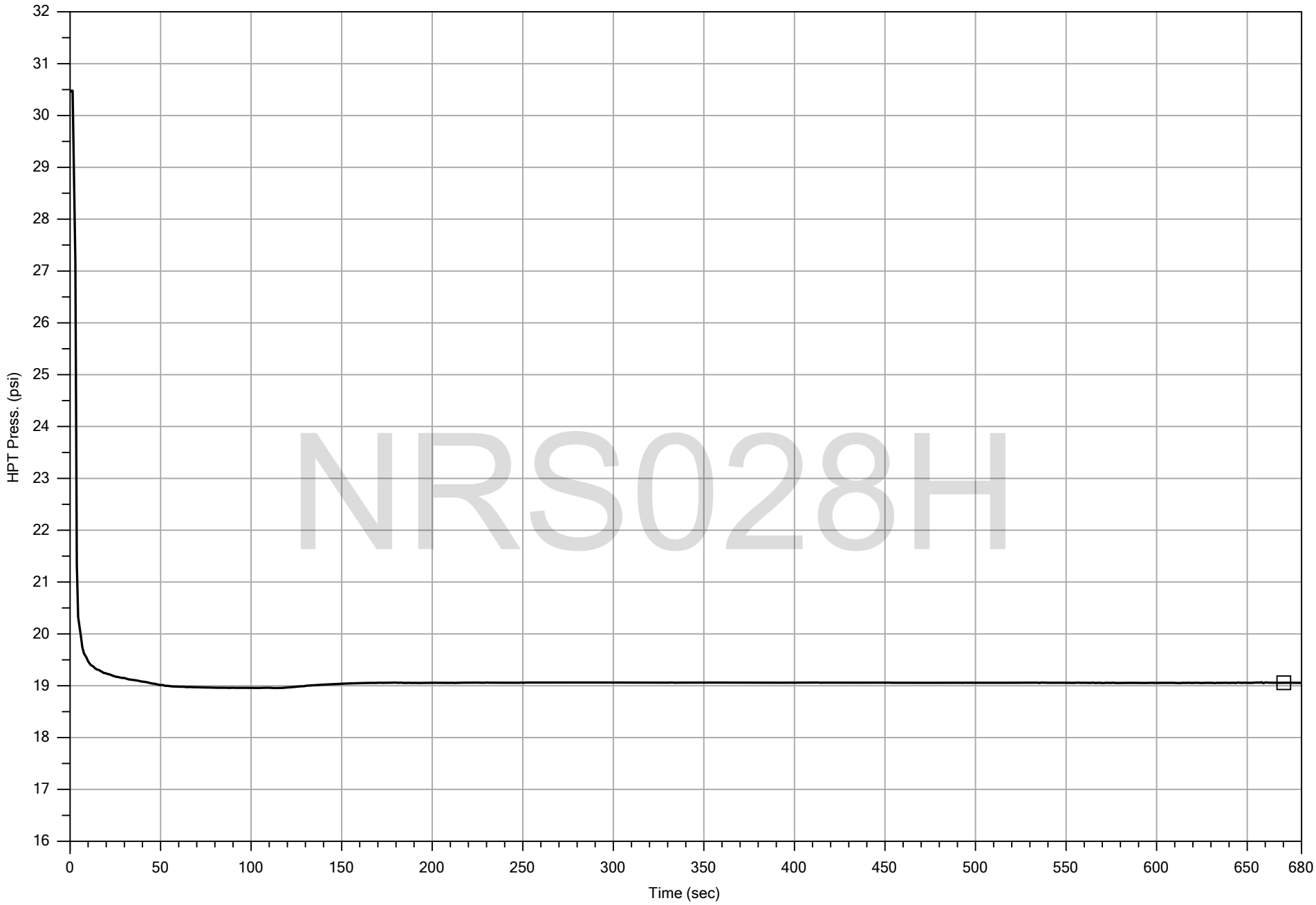
Company: ZTS	Operator: RR	File: NRS027H.DIS	Date: 6/24/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 28.95 ft	Test: 1



			File: NRS028H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:

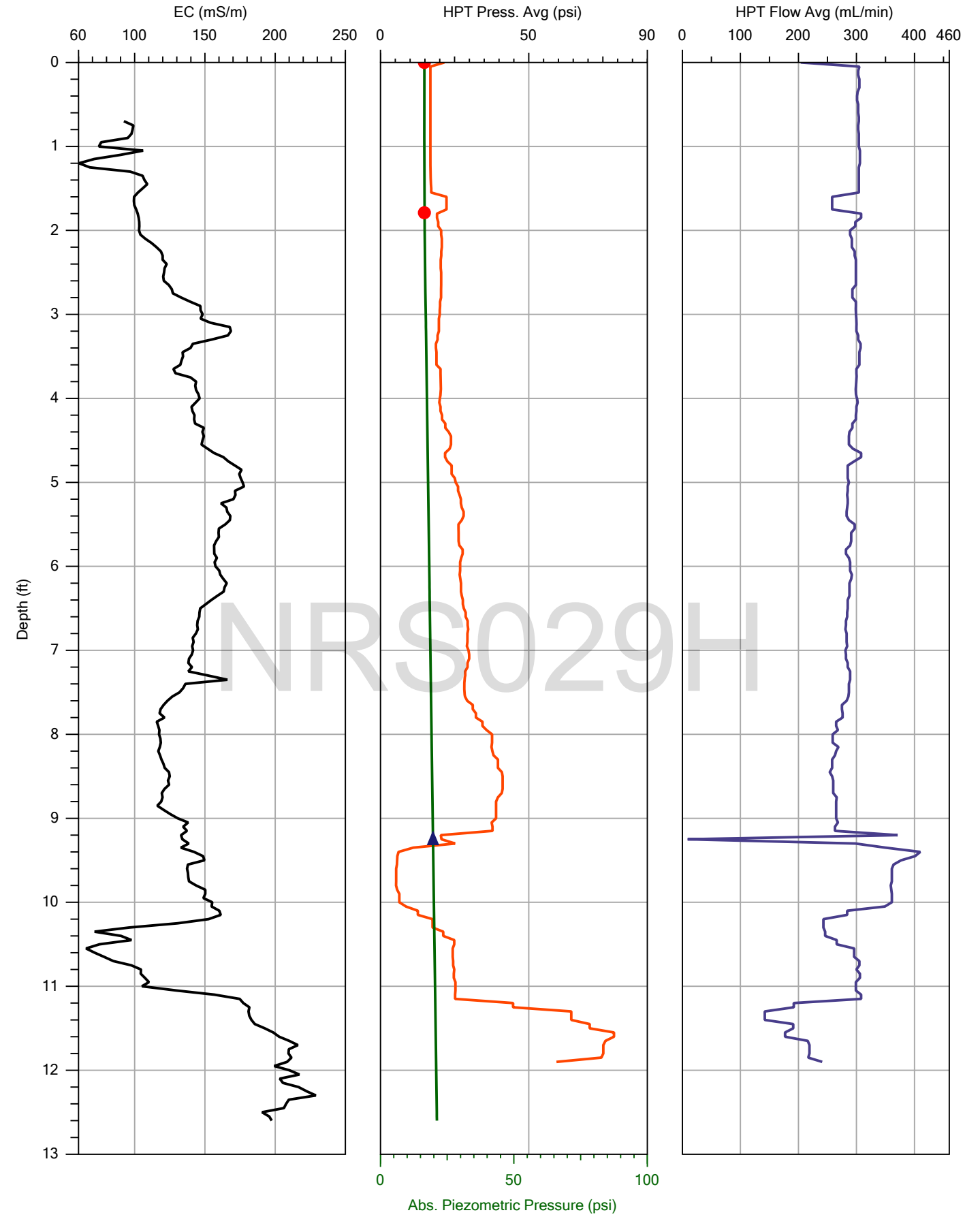


			File: NRS028H.DAT
Company: ZTS		Operator: RR	Date: 6/24/2015
Project ID: TVA		Client: AECOM	Location:

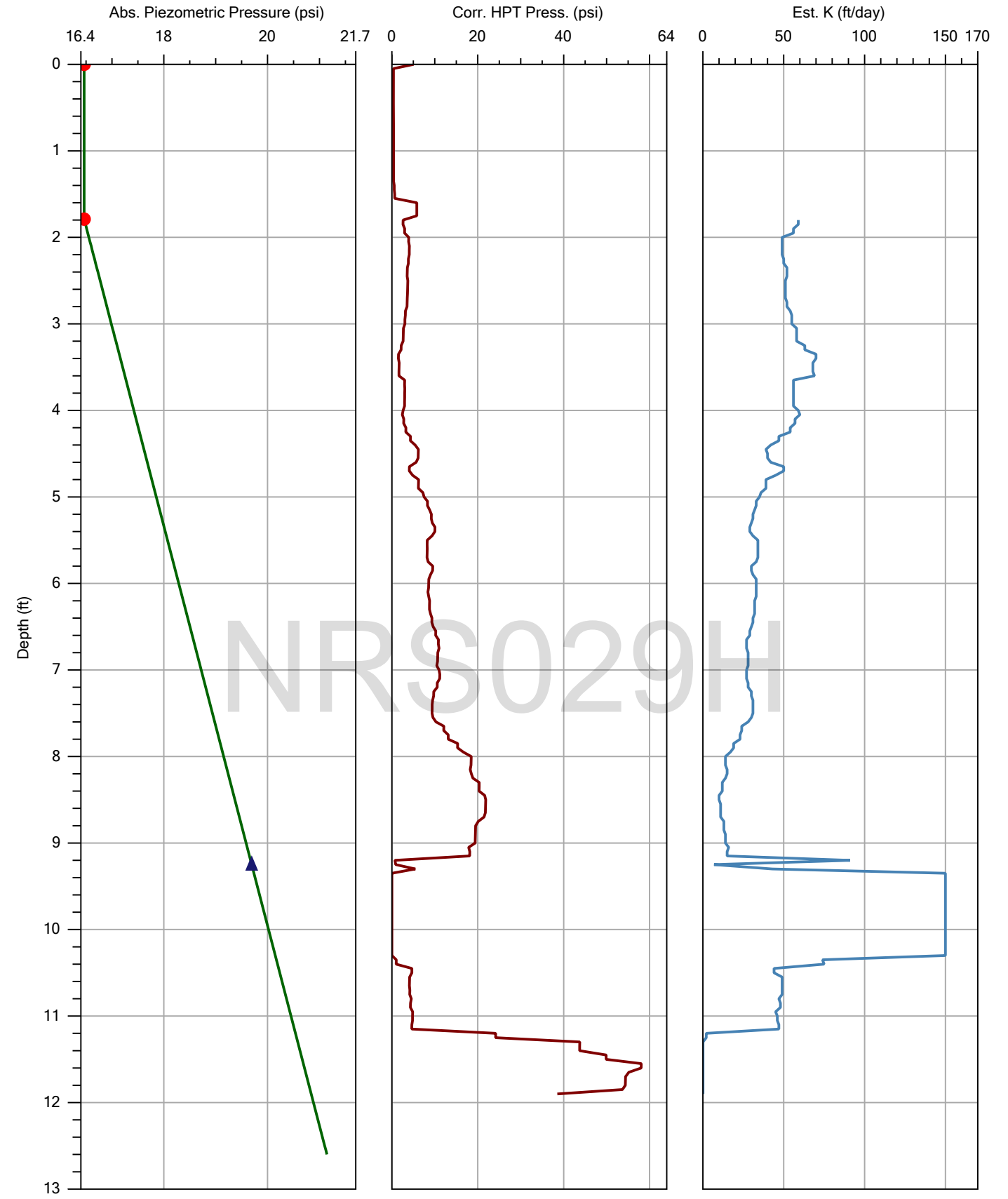


HPT DISSIPATION (SINGLE CASE)

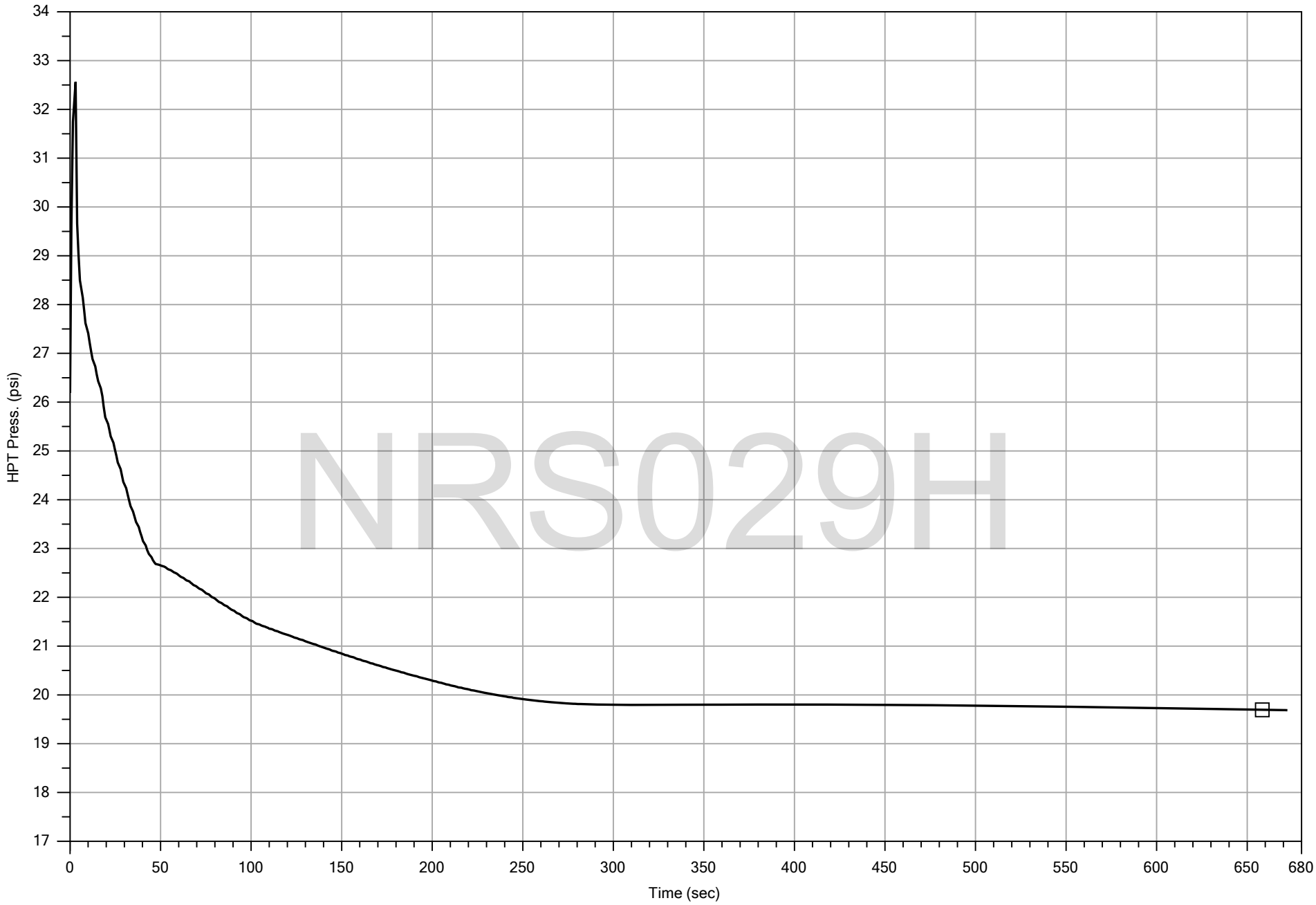
Company: ZTS	Operator: RR	File: NRS028H.DIS	Date: 6/24/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 11.75 ft	Test: 1



			File: NRS029H.DAT
Company: ZTS	Operator: RR	Date: 6/24/2015	
Project ID: TVA	Client: AECOM	Location:	



			File: NRS029H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:



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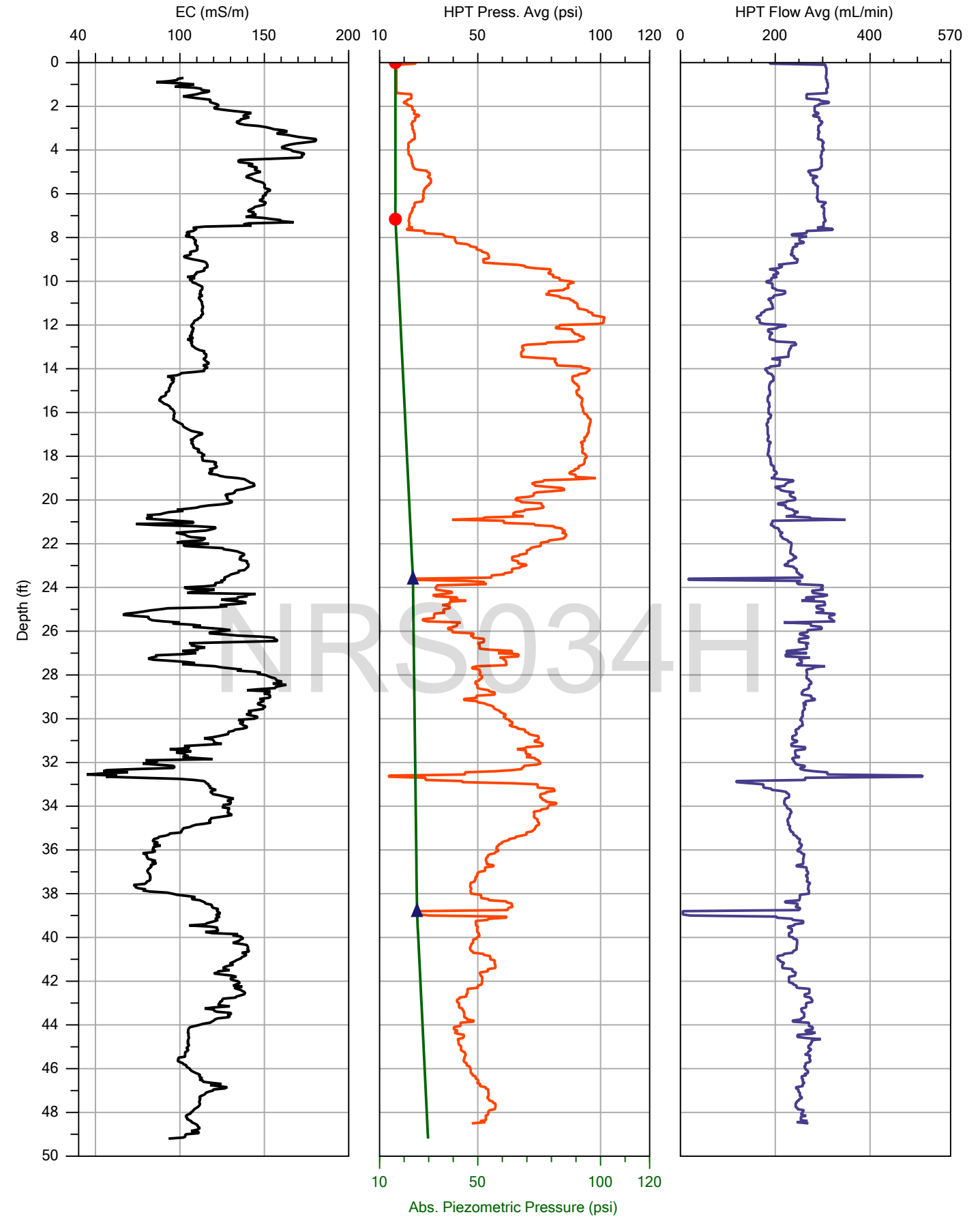
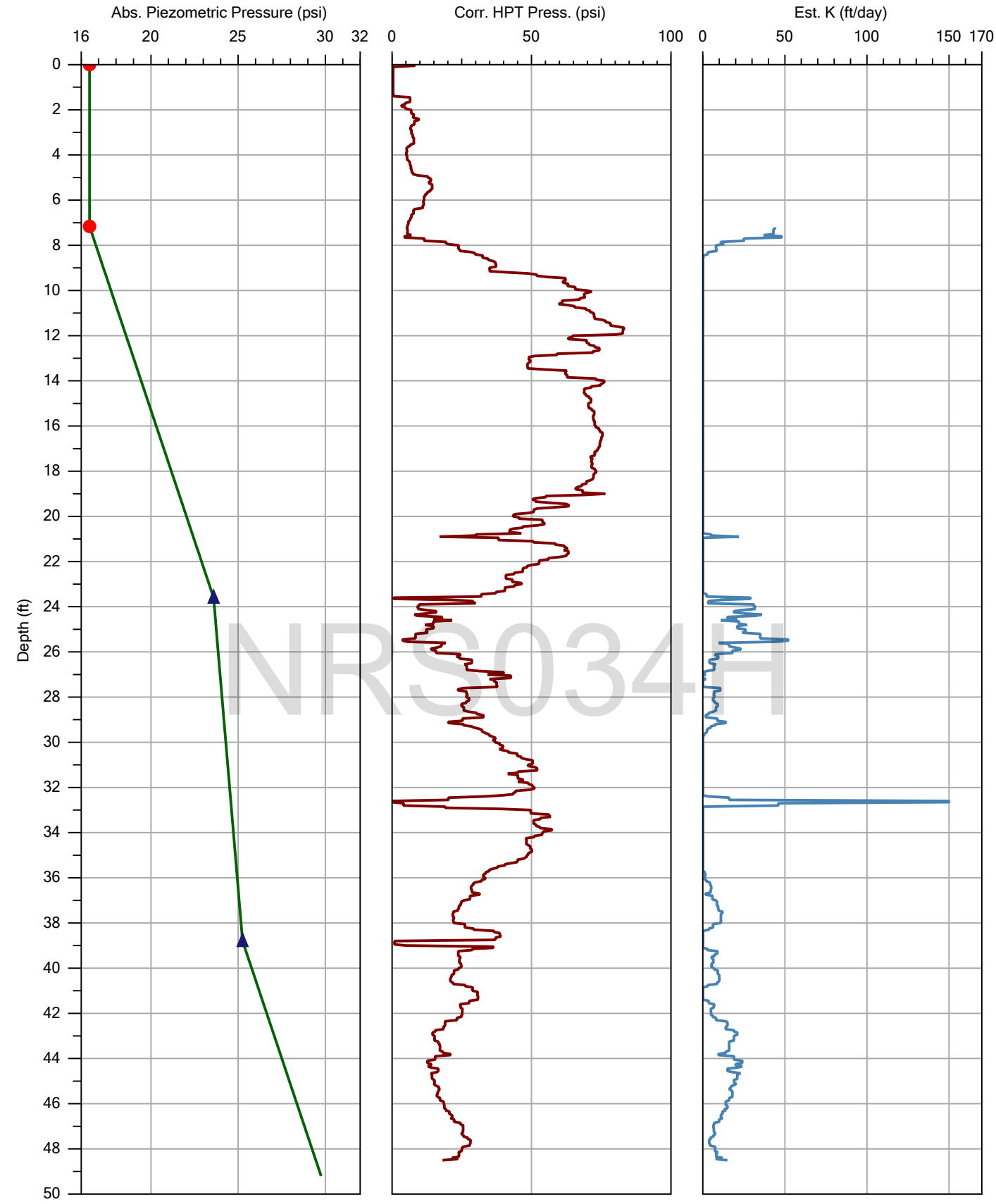
HPT DISSIPATION (SINGLE CASE)

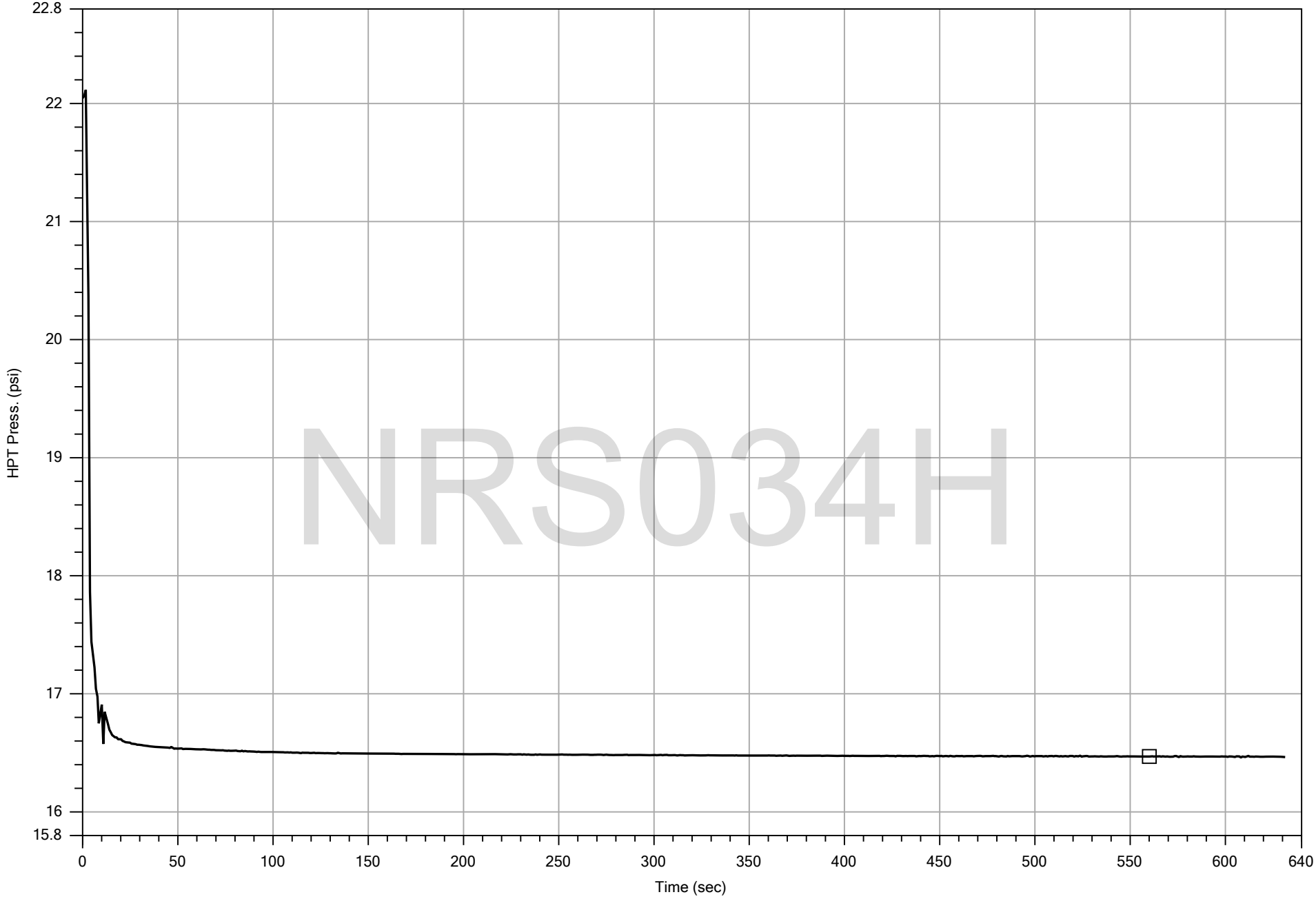
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 9.25 ft	Test: 1
File: NRS029H.DIS			Date: 6/24/2015



			File: NRS030H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:

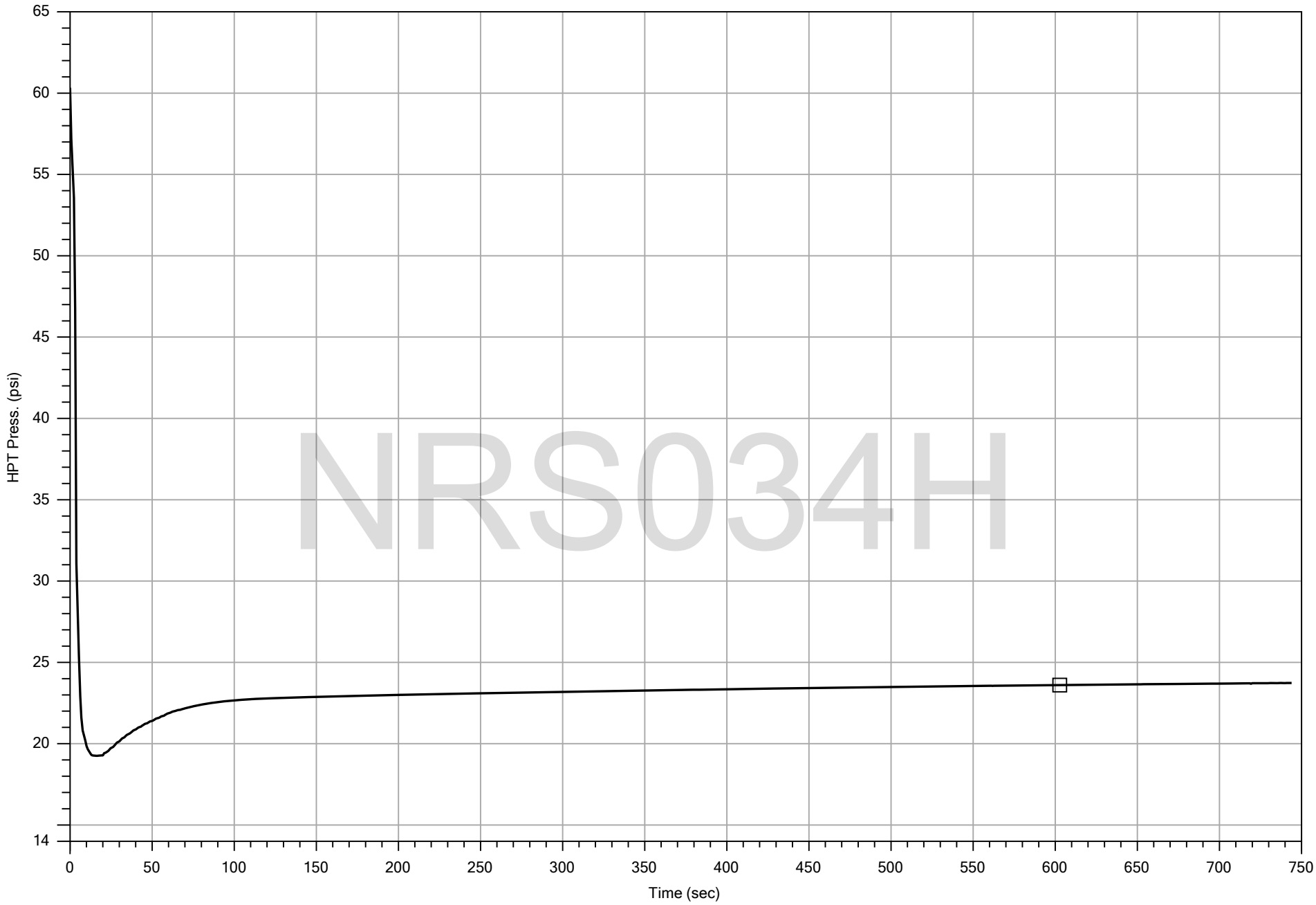


			File: NRS030H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:



HPT DISSIPATION (SINGLE CASE)

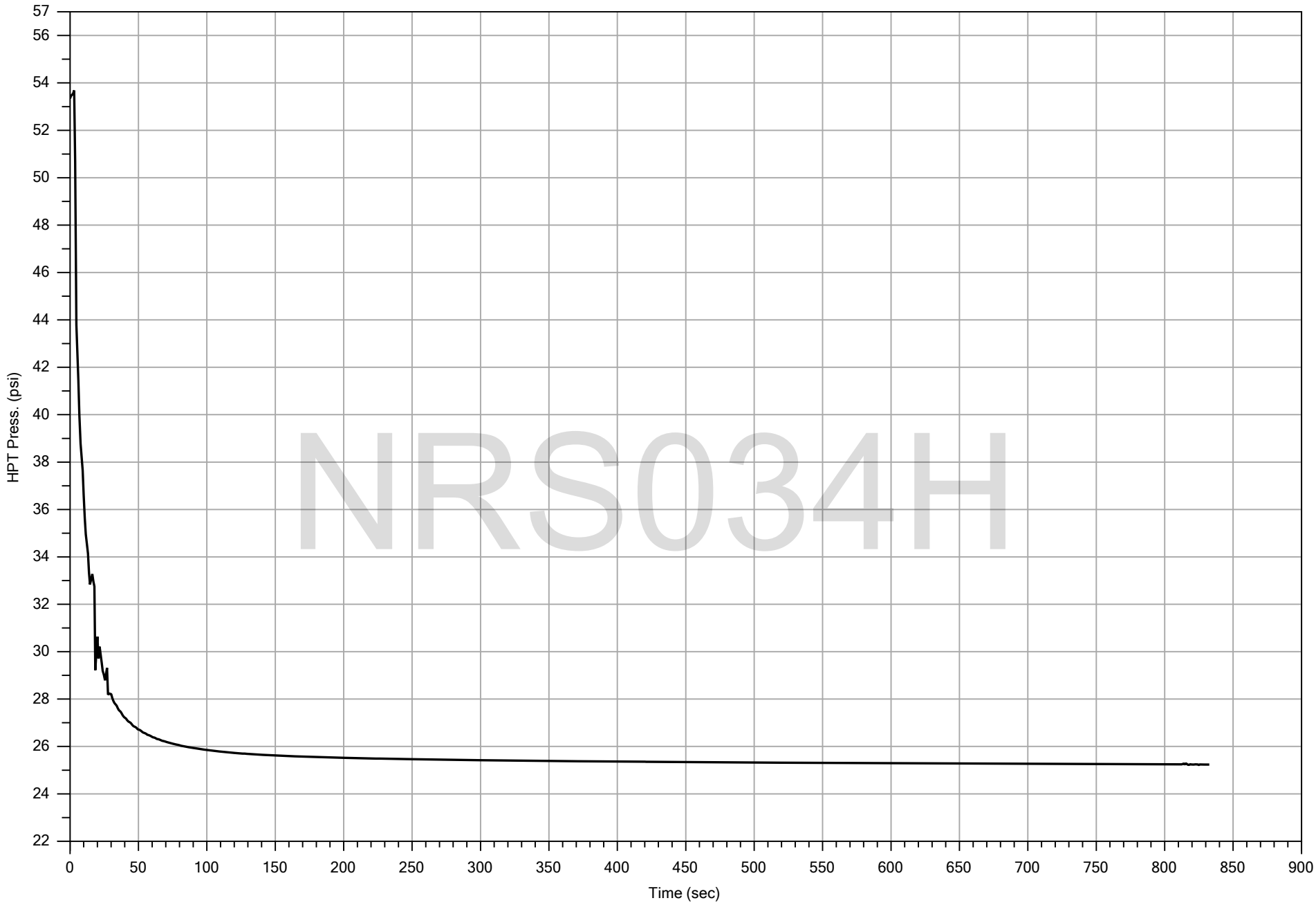
Company: ZTS	Operator: RR	File: NRS030HA.DIS	Date: 6/24/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 4.70 ft	Test: 1



ZEBRA

HPT DISSIPATION (SINGLE CASE)

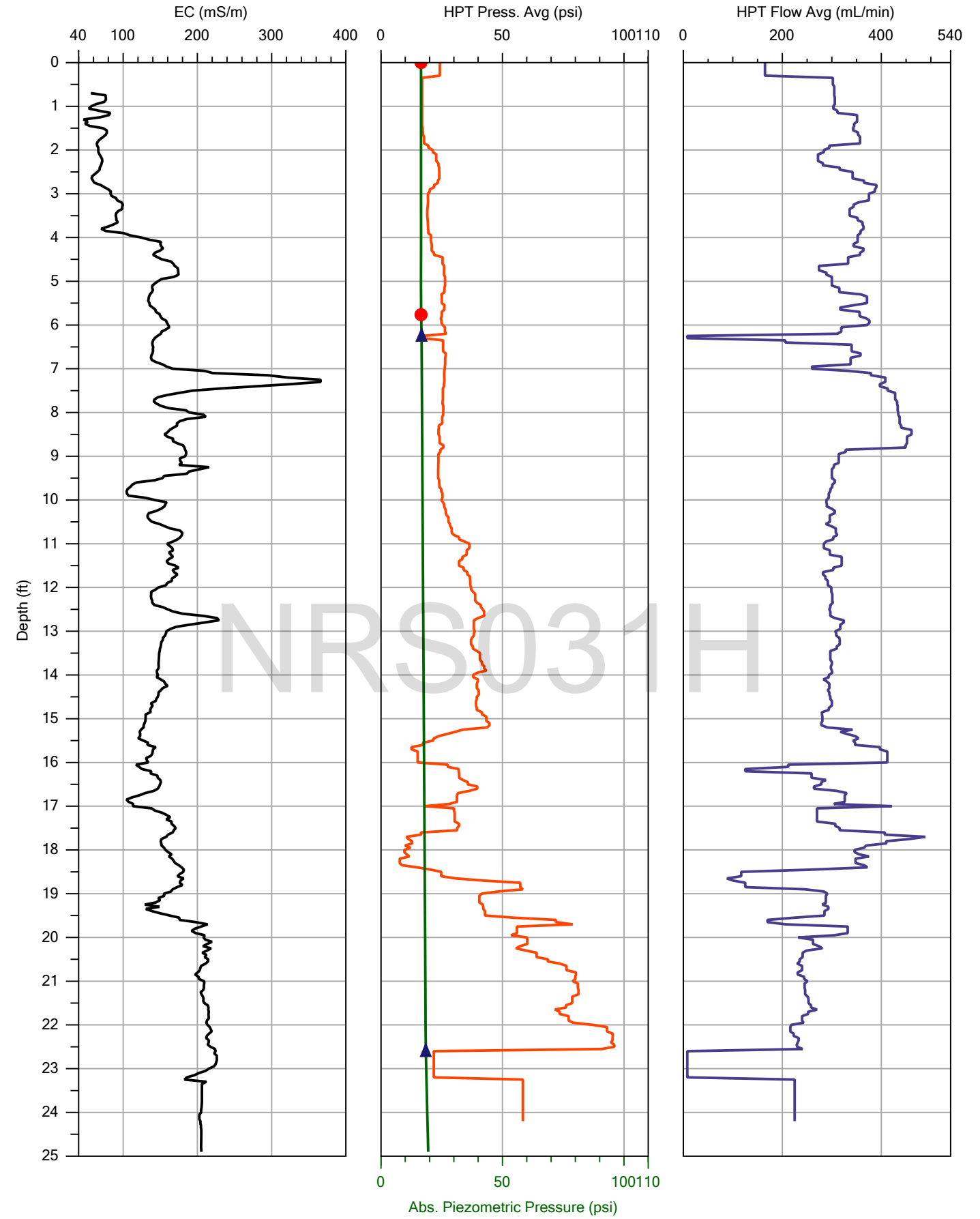
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 23.60 ft	Test: 1
File: NRS030H.DIS			Date: 6/24/2015



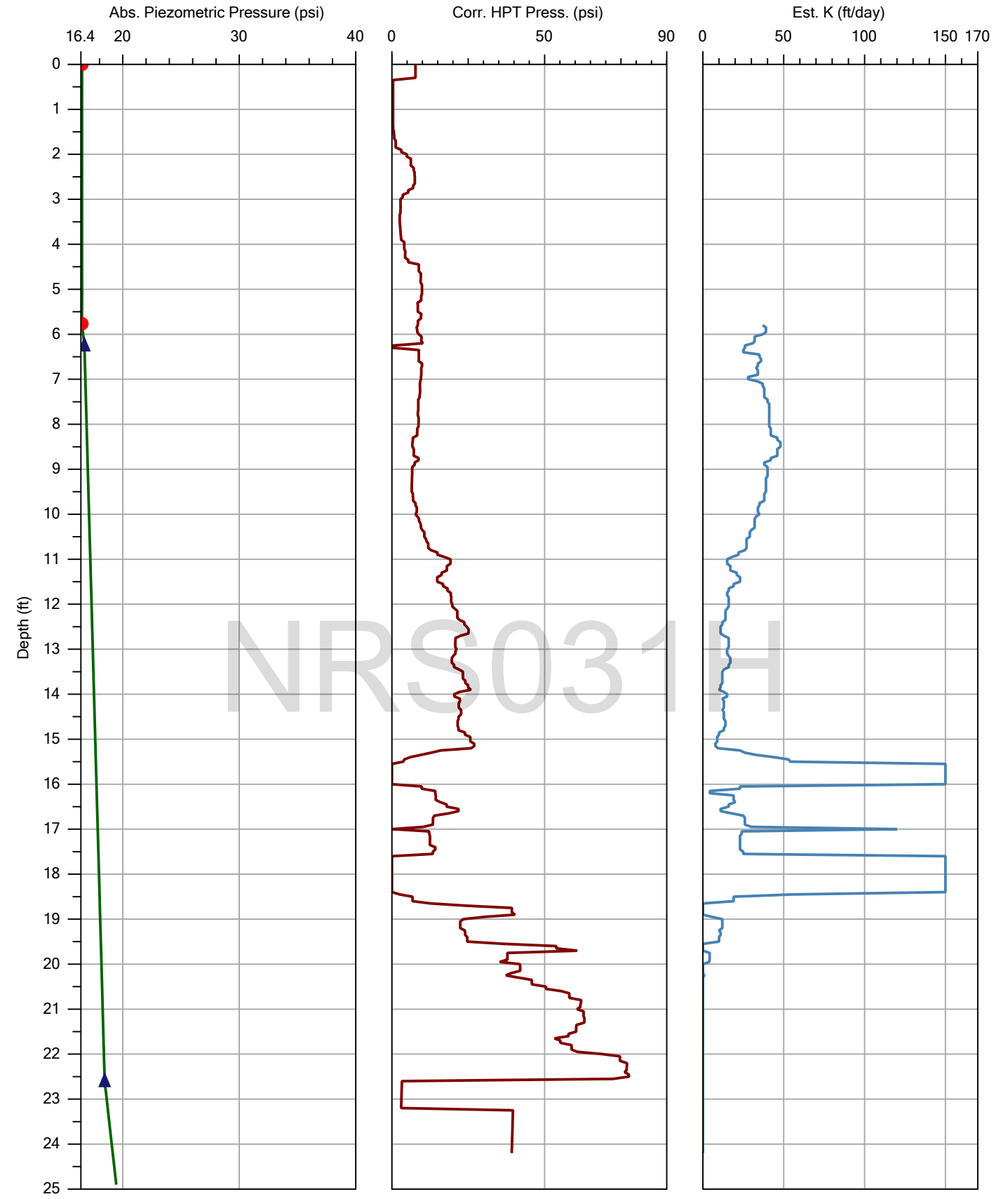
ZEBRA

HPT DISSIPATION (SINGLE CASE)

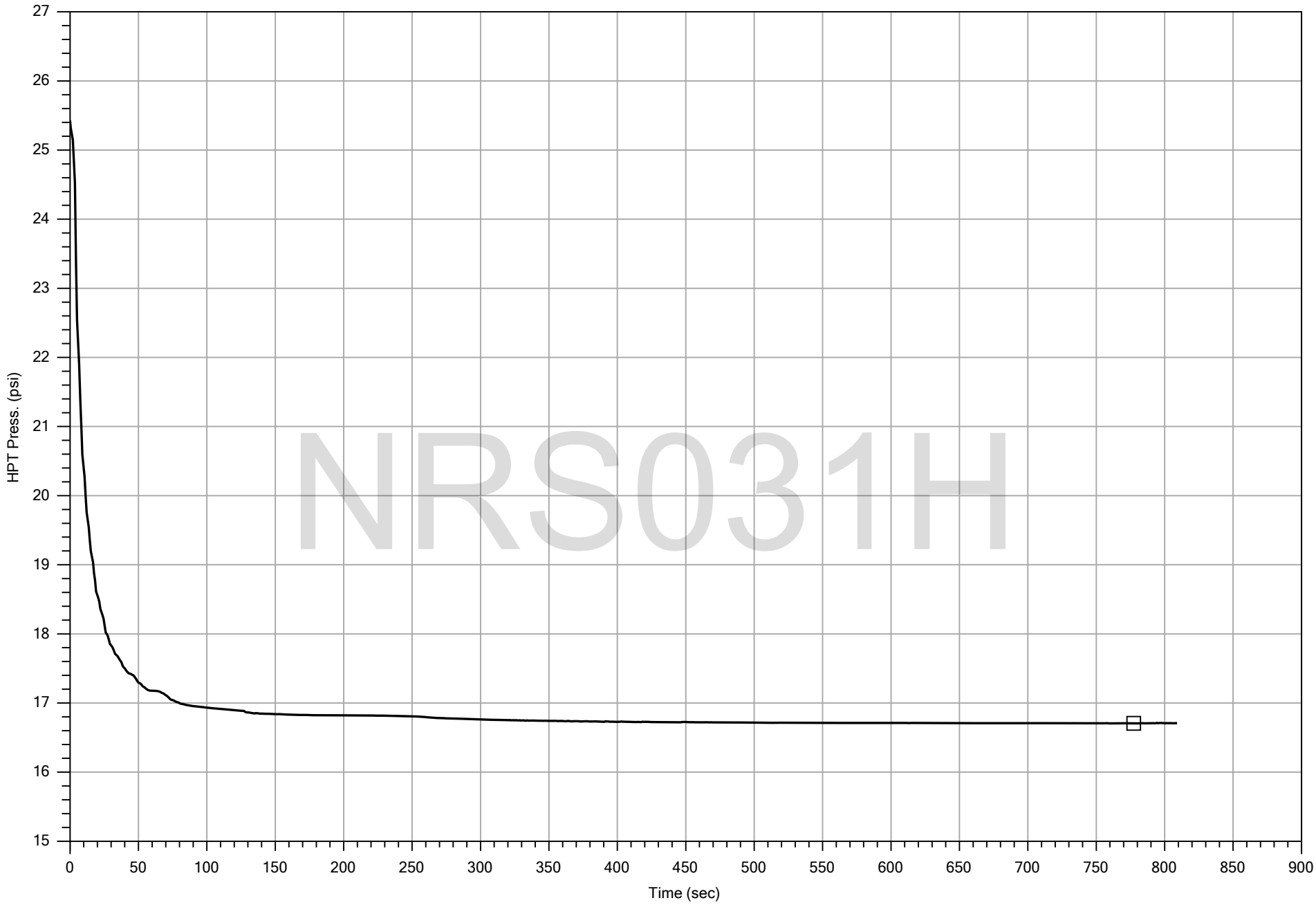
Company: ZTS	Operator: RR	File: NRS030H.DIS	Date: 6/24/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 38.80 ft	Test: 1



			File: NRS031H.DAT
Company: ZTS		Operator: RR	Date: 6/24/2015
Project ID: TVA		Client: AECOM	Location:

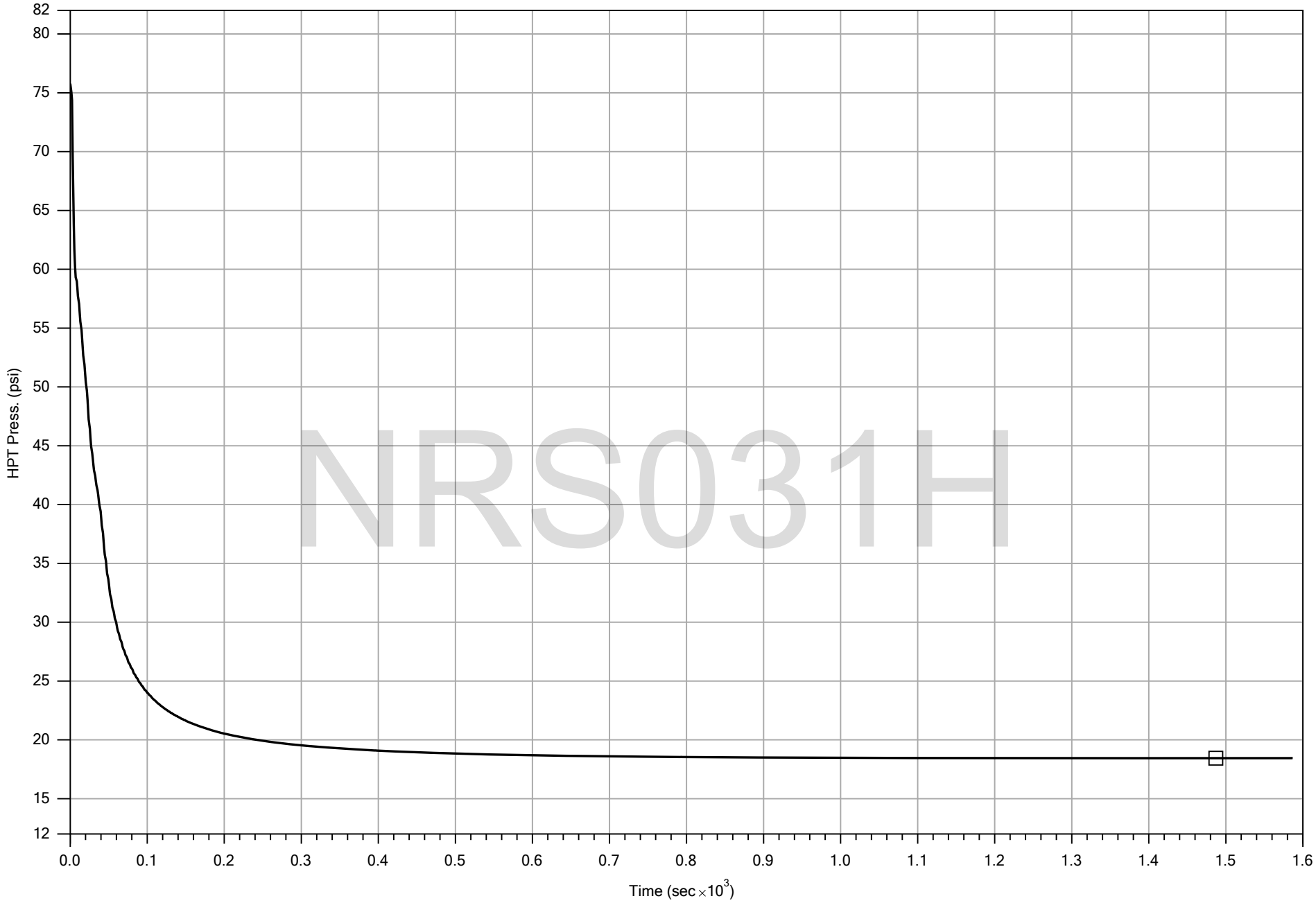


			File: NRS031H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:



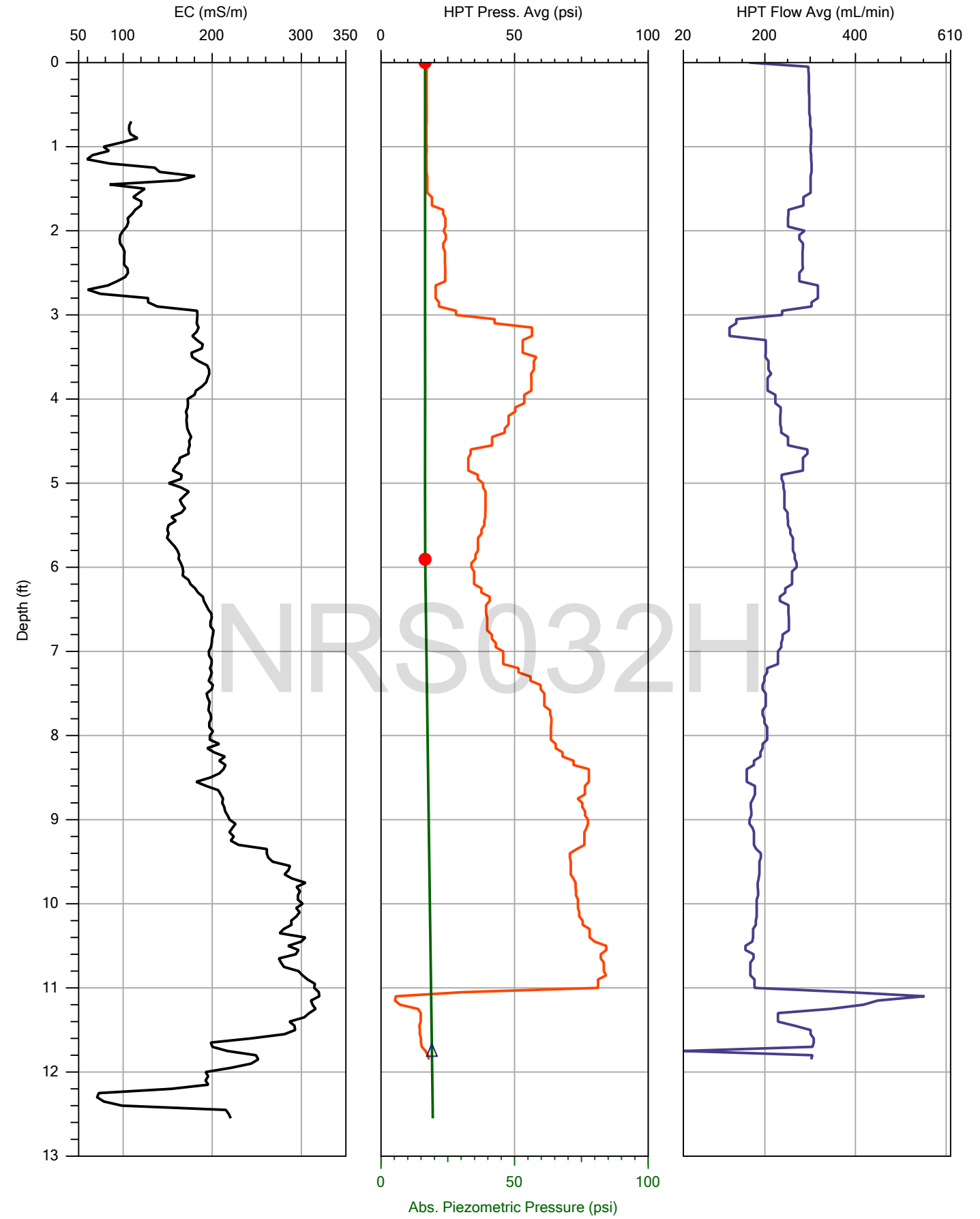
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS031H.DIS	Date: 6/24/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 6.25 ft	Test: 1

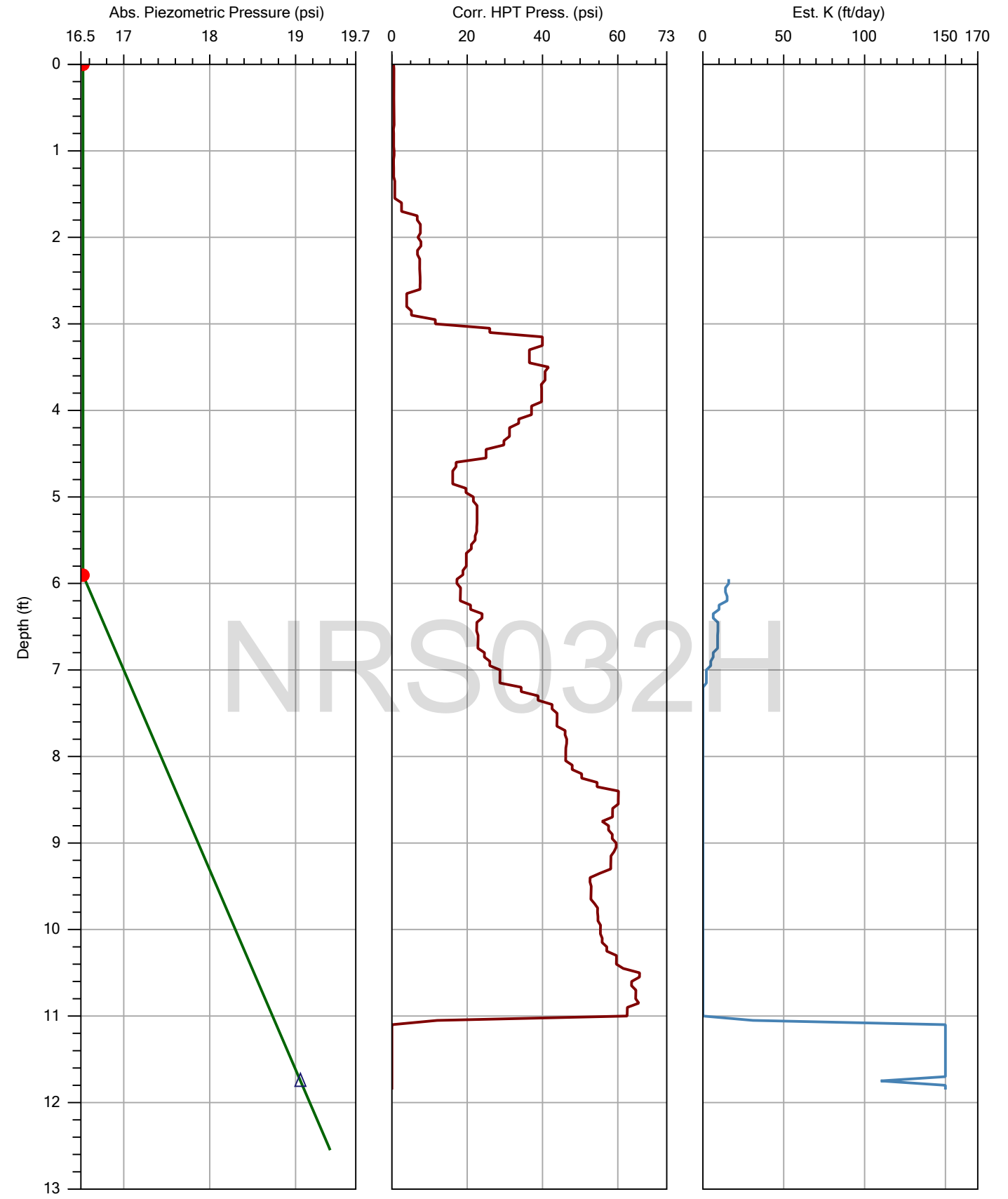


HPT DISSIPATION (SINGLE CASE)

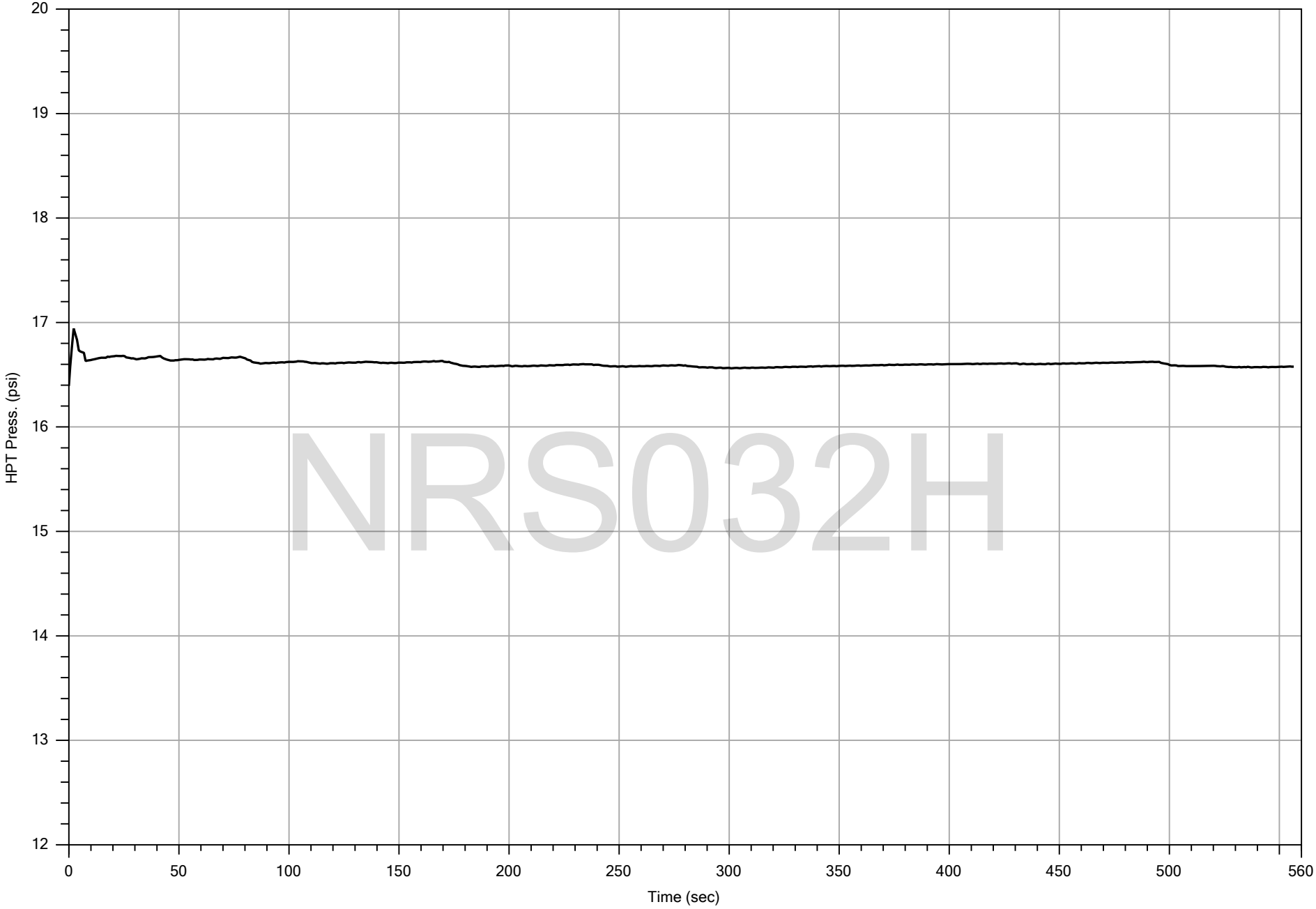
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 22.60 ft	Test: 1
File: NRS031H.DIS			Date: 6/24/2015



		File: NRS032H.DAT
Company: ZTS	Operator: RR	Date: 6/24/2015
Project ID: TVA	Client: AECOM	Location:

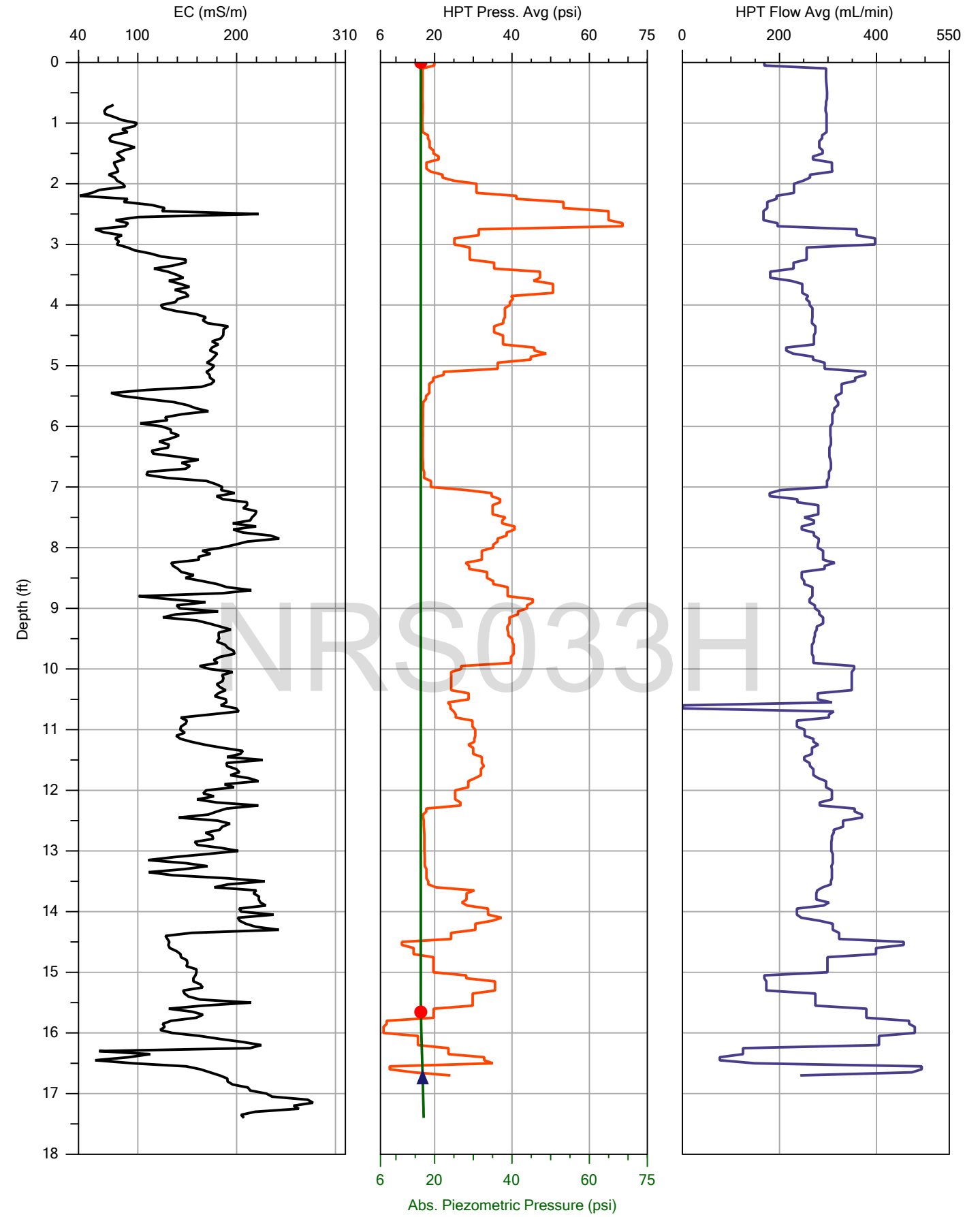


			File: NRS032H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:

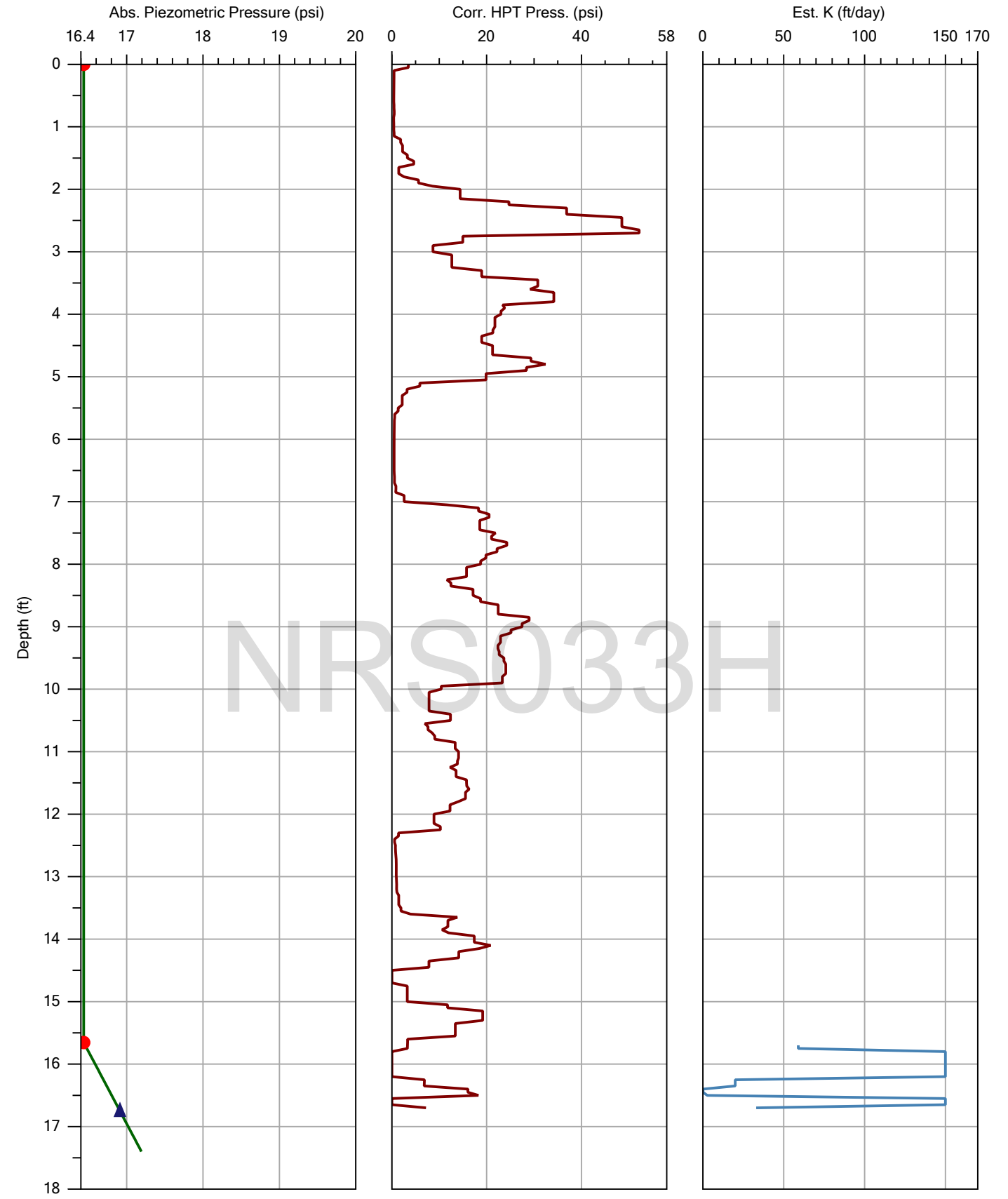


HPT DISSIPATION (SINGLE CASE)

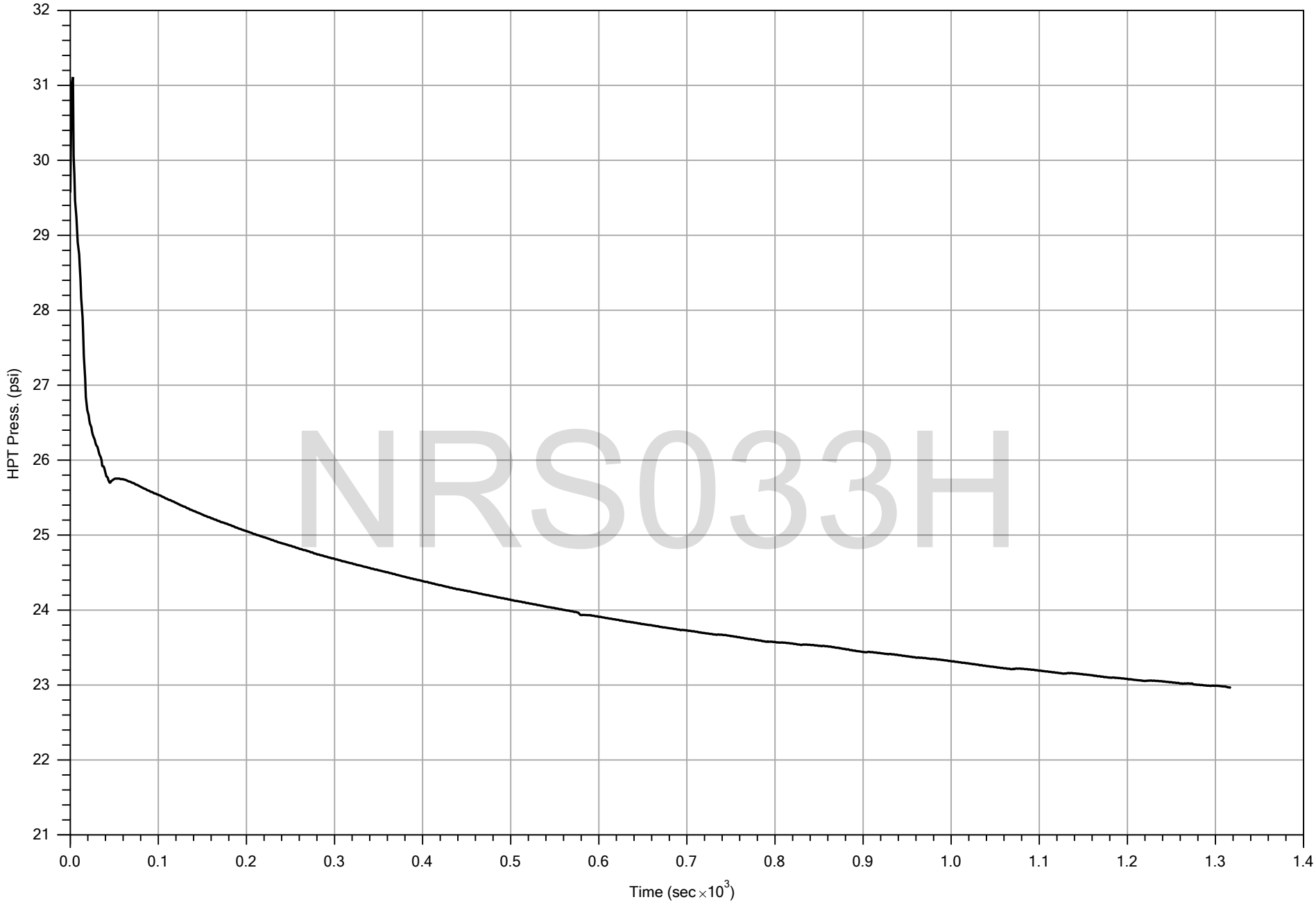
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 11.75 ft	Test: 1
		File: NRS032H.DIS	Date: 6/24/2015



			File: NRS033H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:



			File: NRS033H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:



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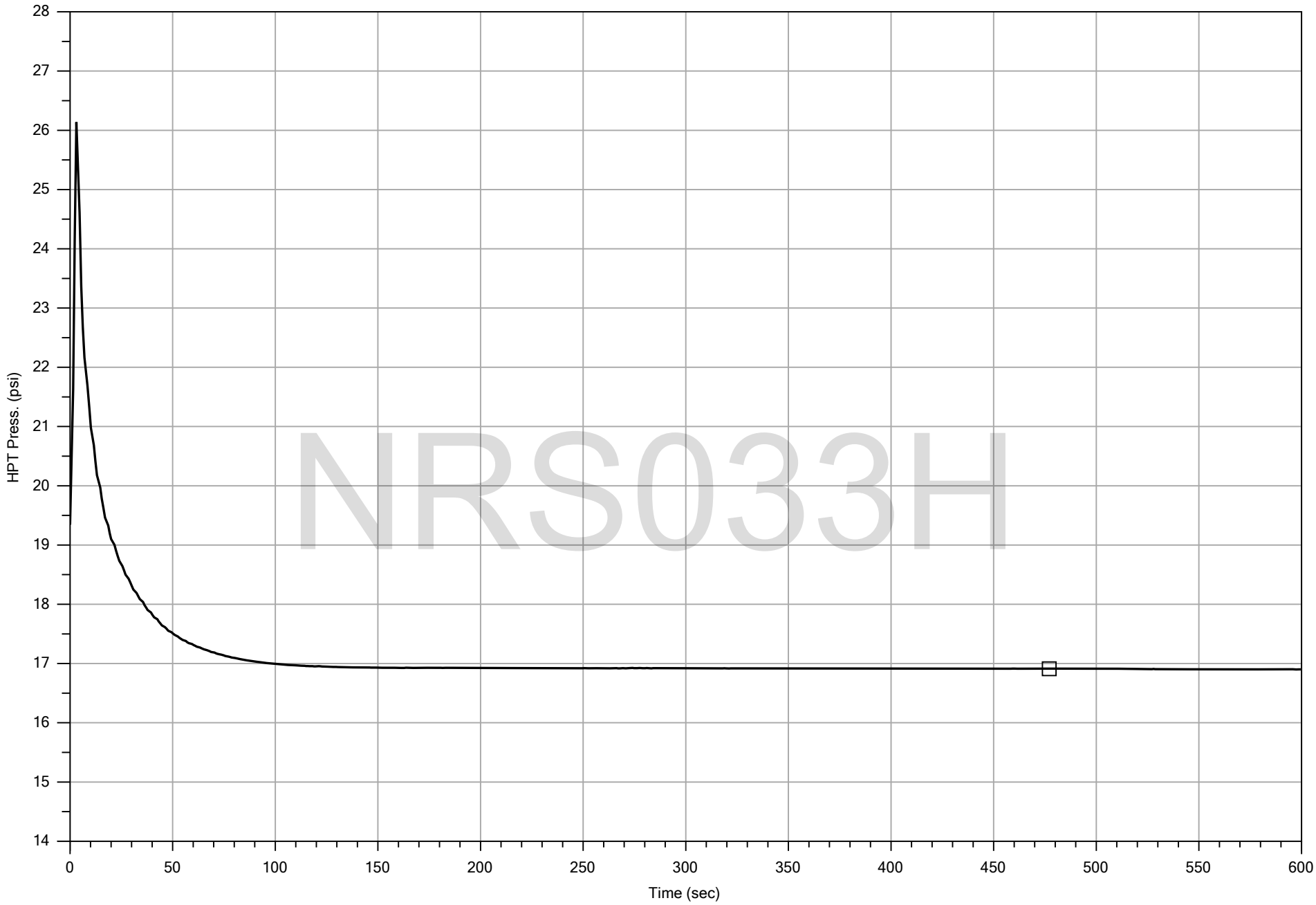
HPT DISSIPATION (SINGLE CASE)

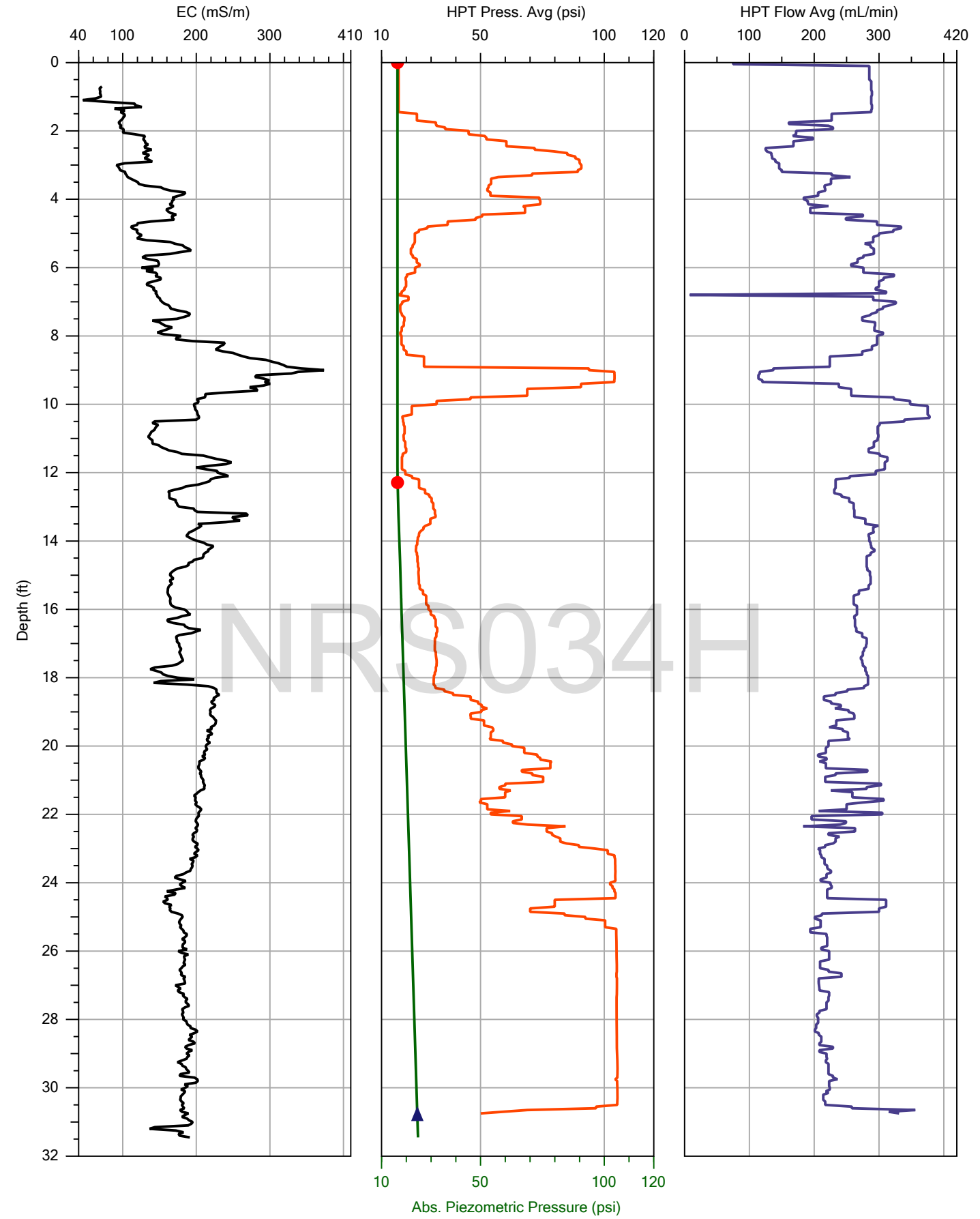
Company: ZTS	Operator: RR	File: NRS033H.DIS	Date: 6/24/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 10.60 ft	Test: 1



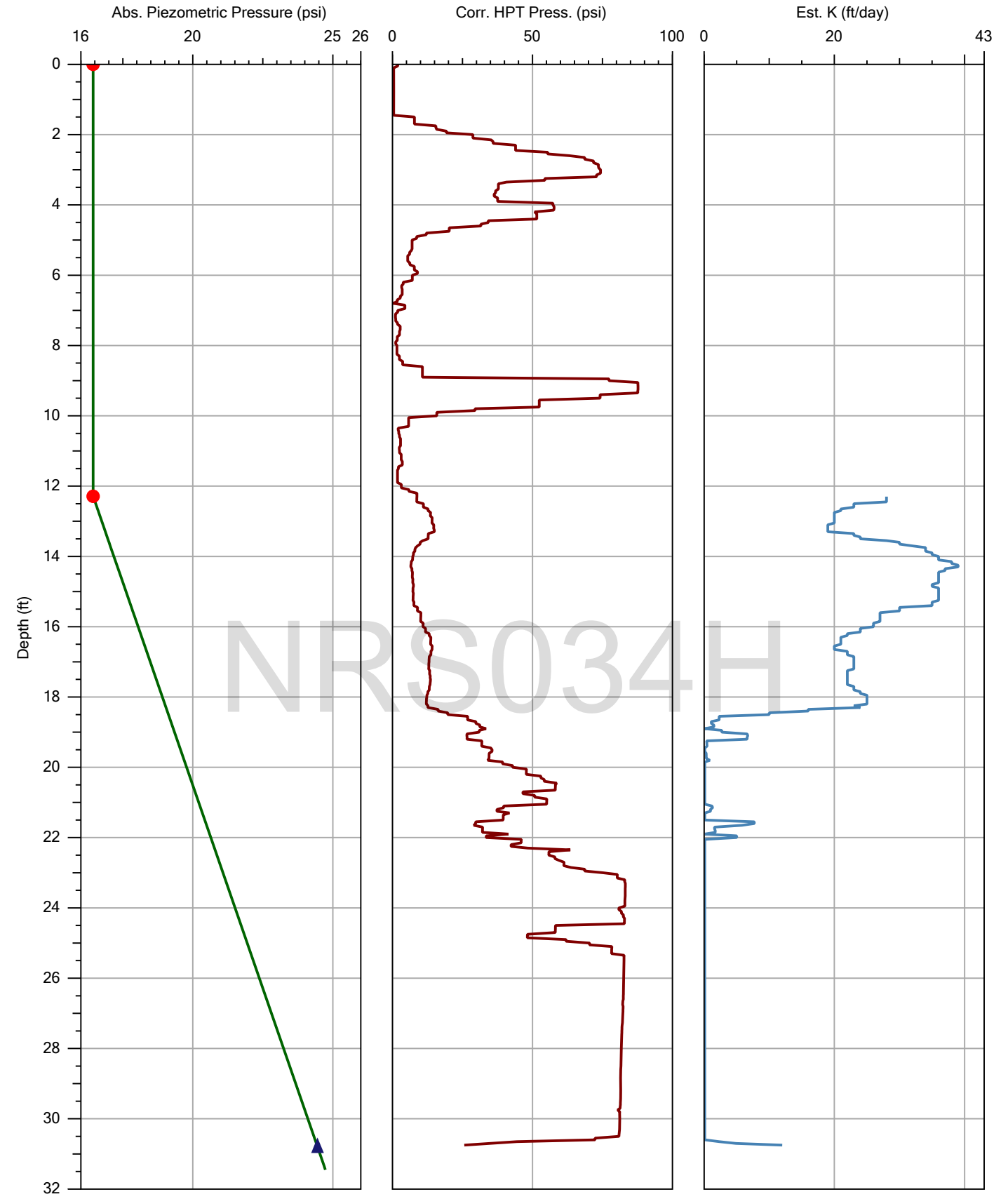
ZEBRA

HPT DISSIPATION (SINGLE CASE)

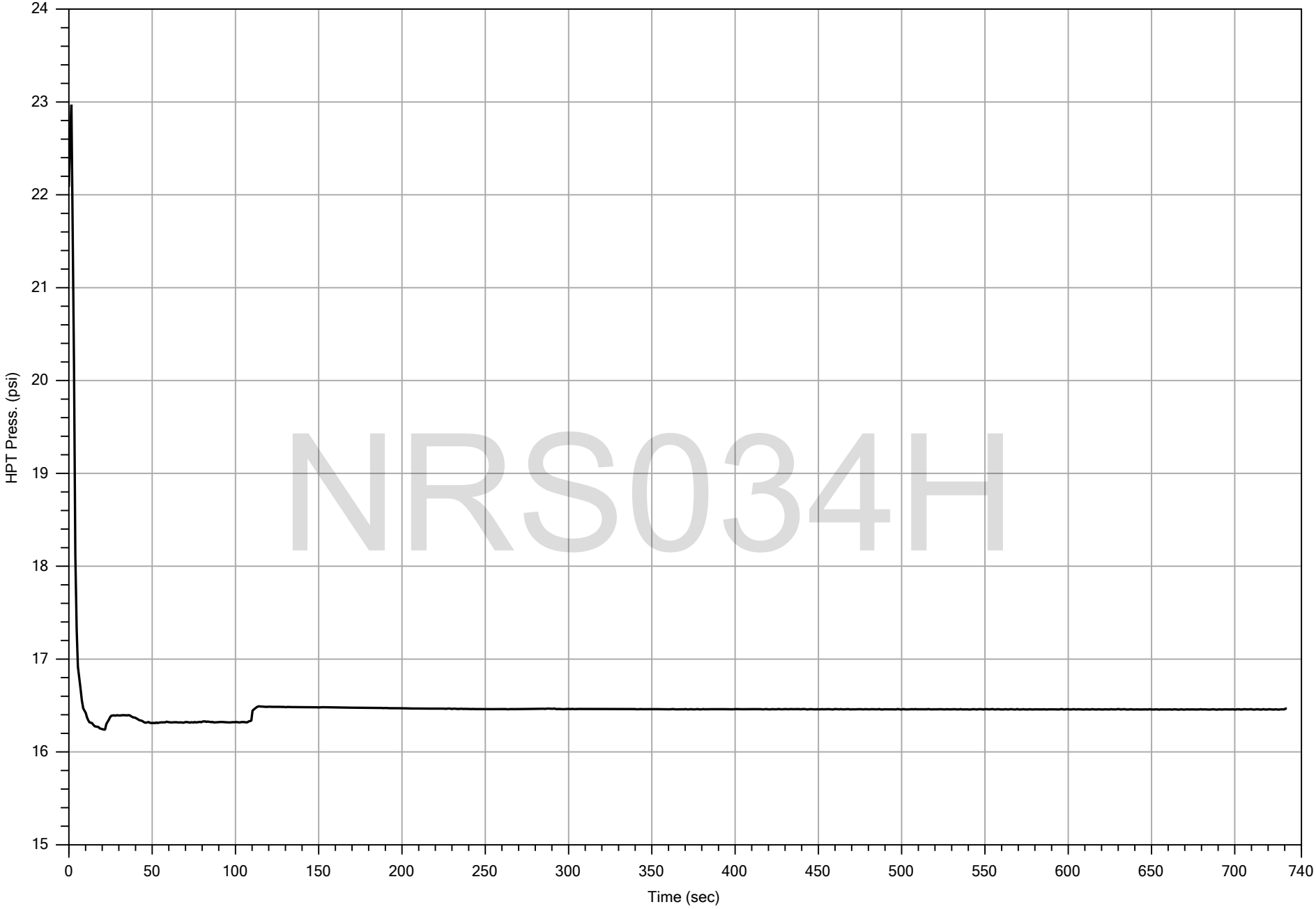
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 16.75 ft	Test: 1
File: NRS033H.DIS			Date: 6/24/2015



			File: NRS034H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:

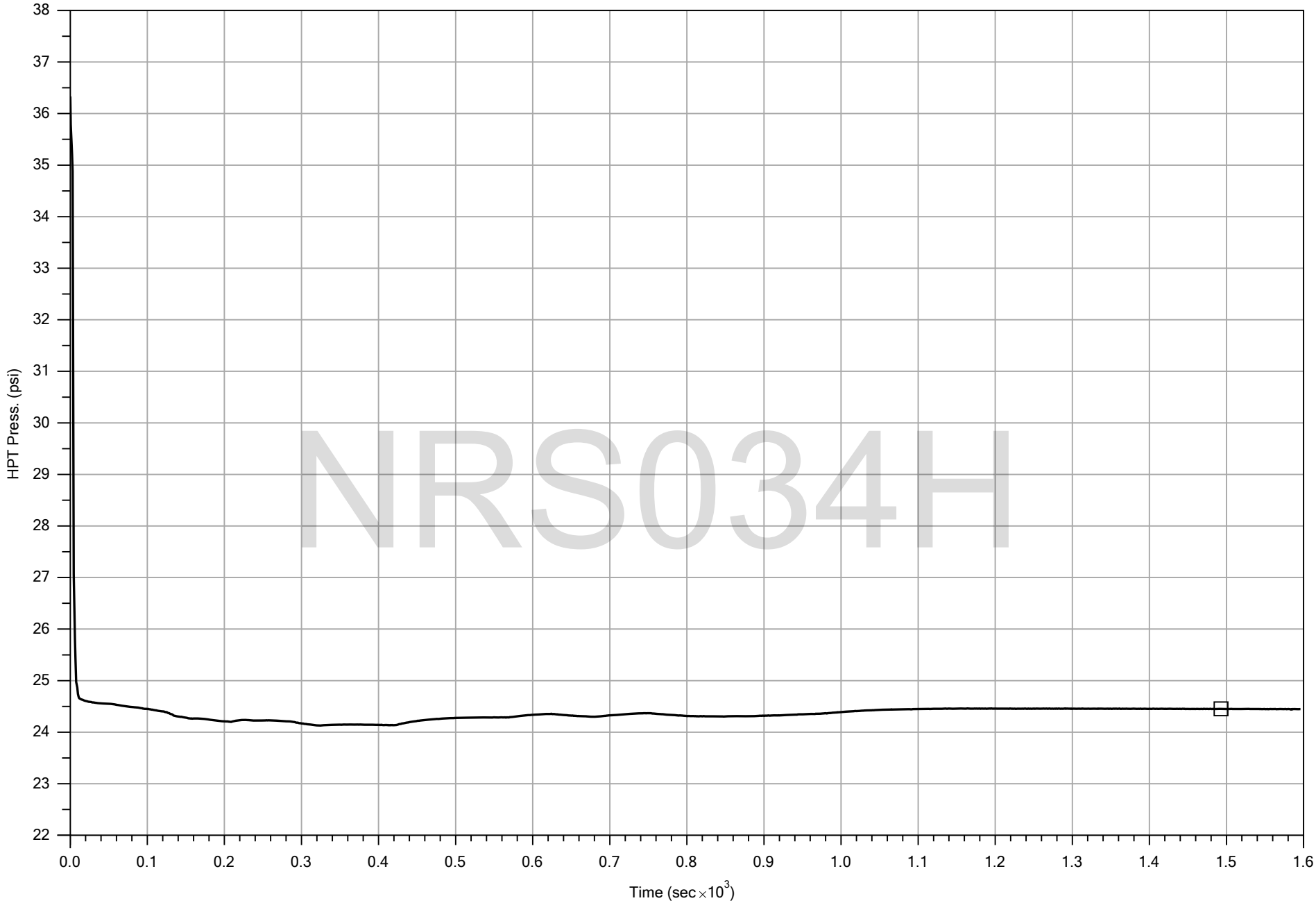


			File: NRS034H.DAT
Company: ZTS	Operator: RR		Date: 6/24/2015
Project ID: TVA	Client: AECOM		Location:



HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS034H.DIS	Date: 6/24/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 6.80 ft	Test: 1



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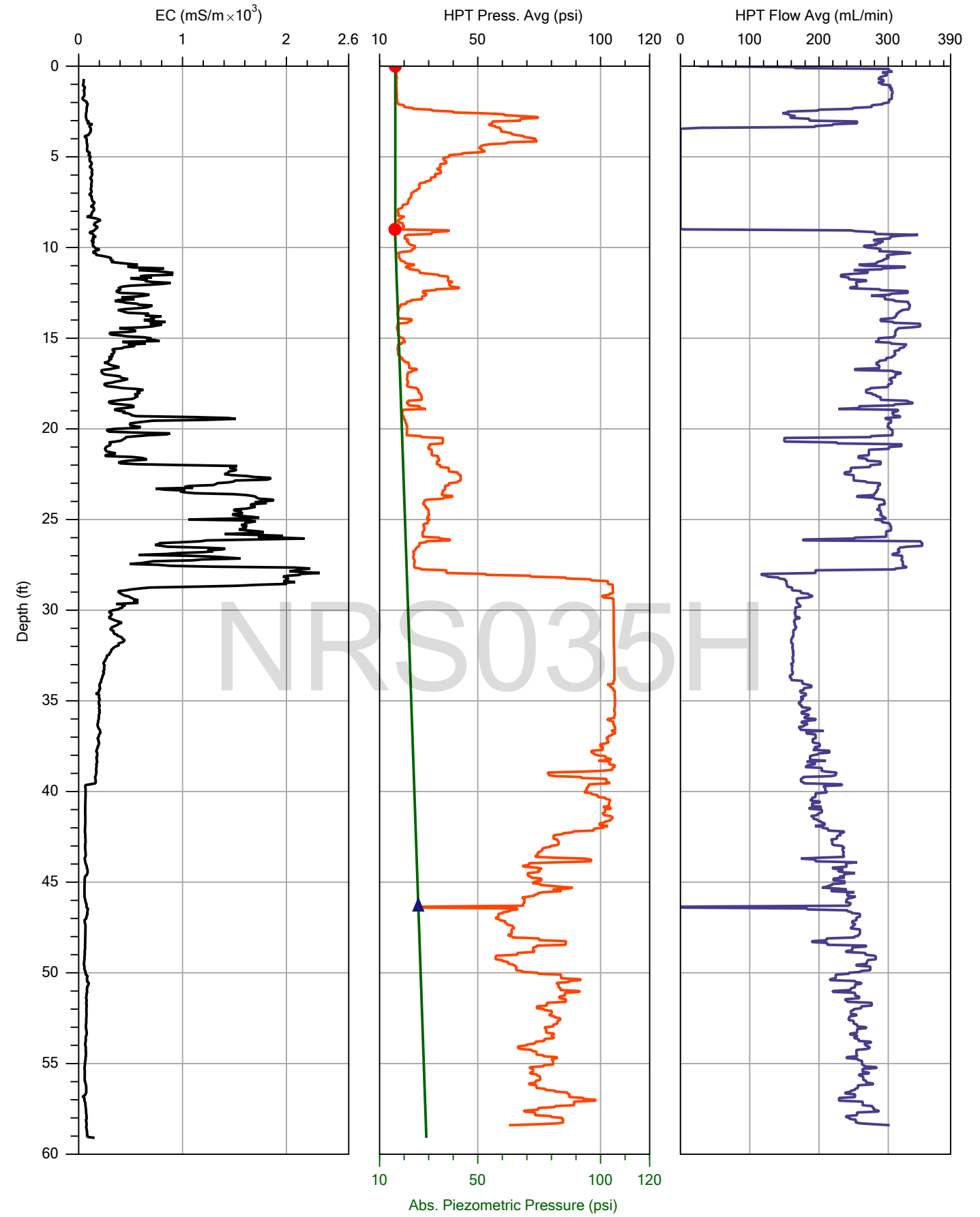
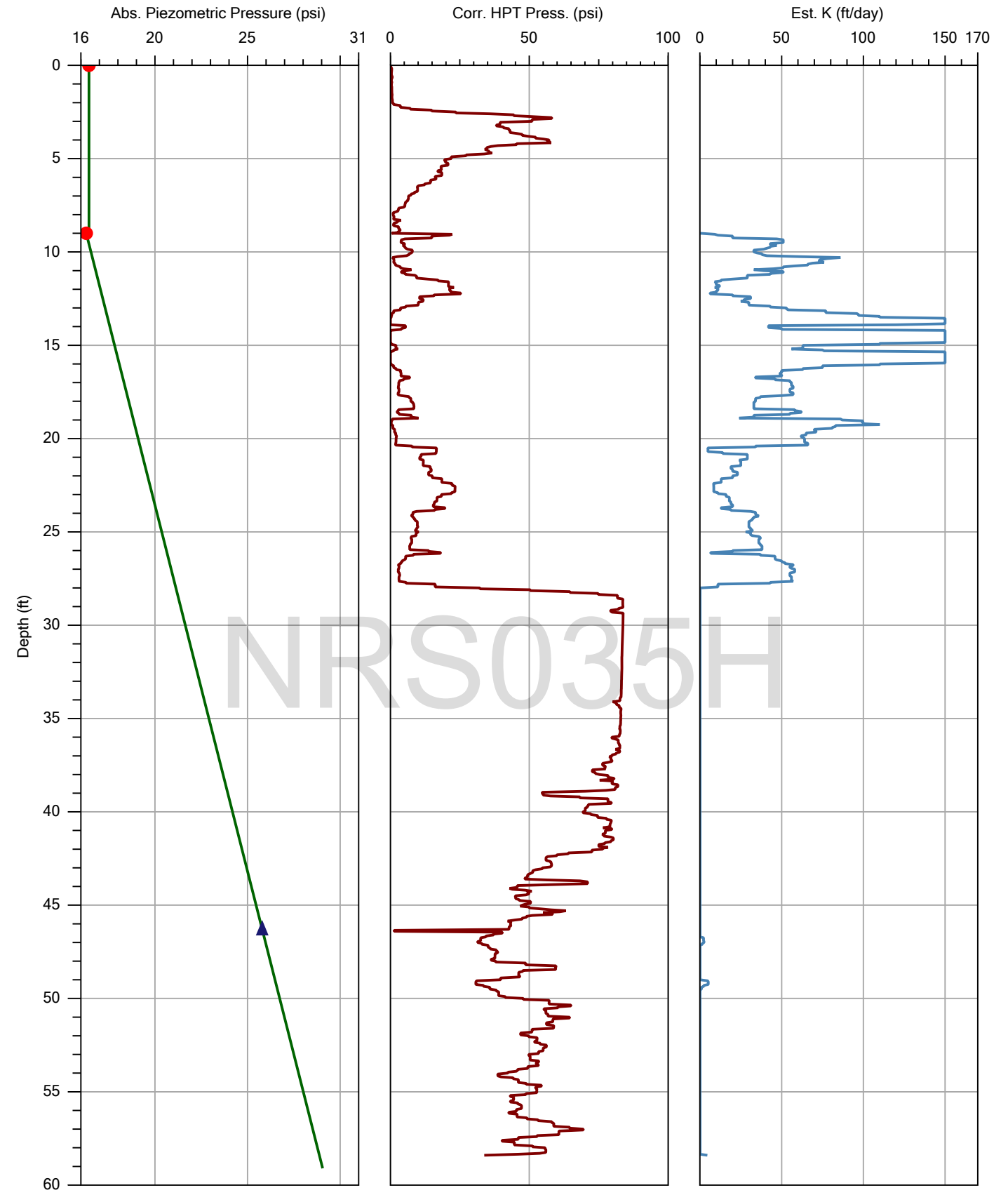
HPT DISSIPATION (SINGLE CASE)

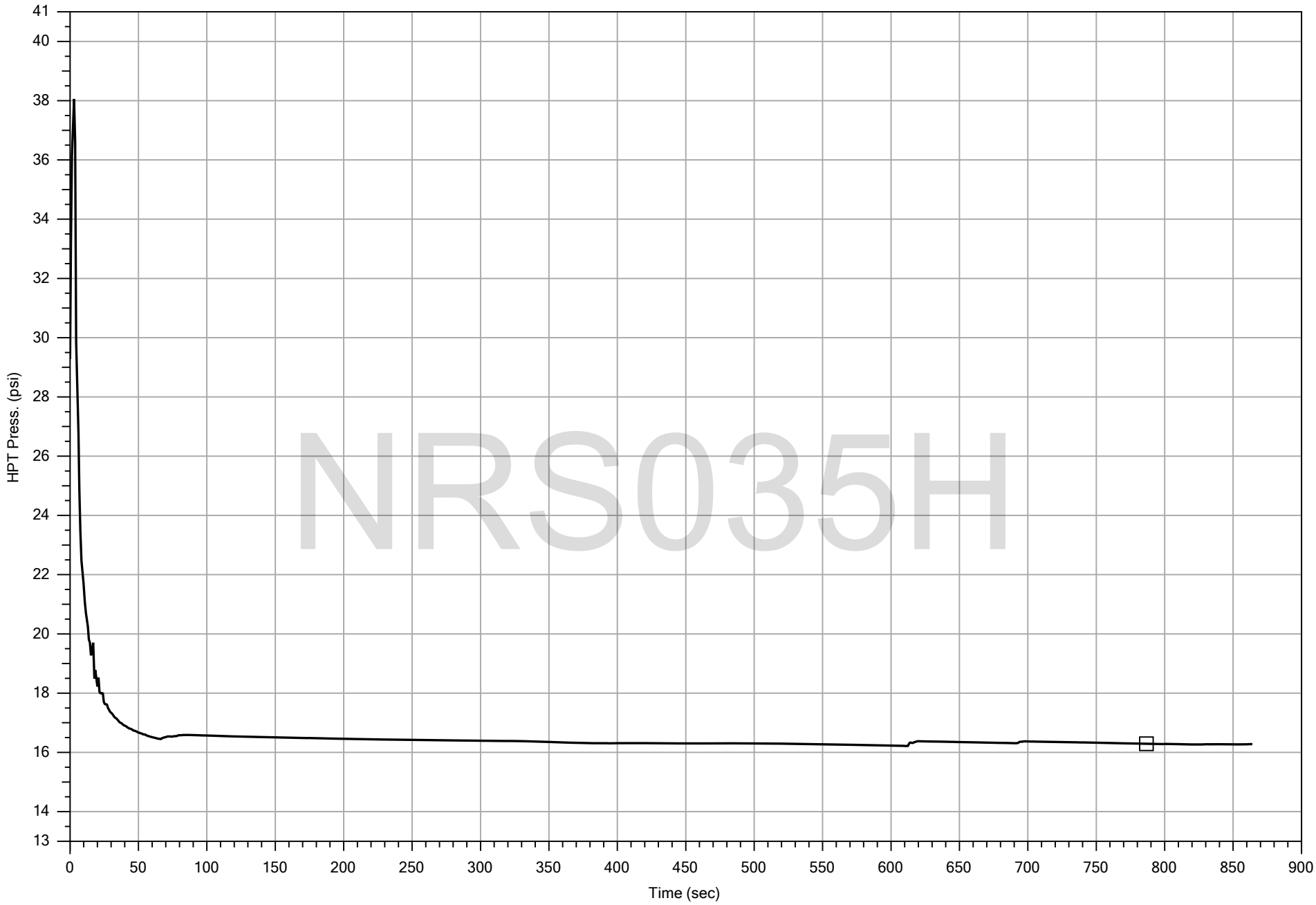
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 30.80 ft	Test: 1
File: NRS034H.DIS			Date: 6/24/2015



			File: NRS035H.DAT
Company: ZTS	Operator: RR		Date: 6/25/2015
Project ID: TVA	Client: AECOM		Location:



			File: NRS035H.DAT
Company: ZTS	Operator: RR		Date: 6/25/2015
Project ID: TVA	Client: AECOM		Location:



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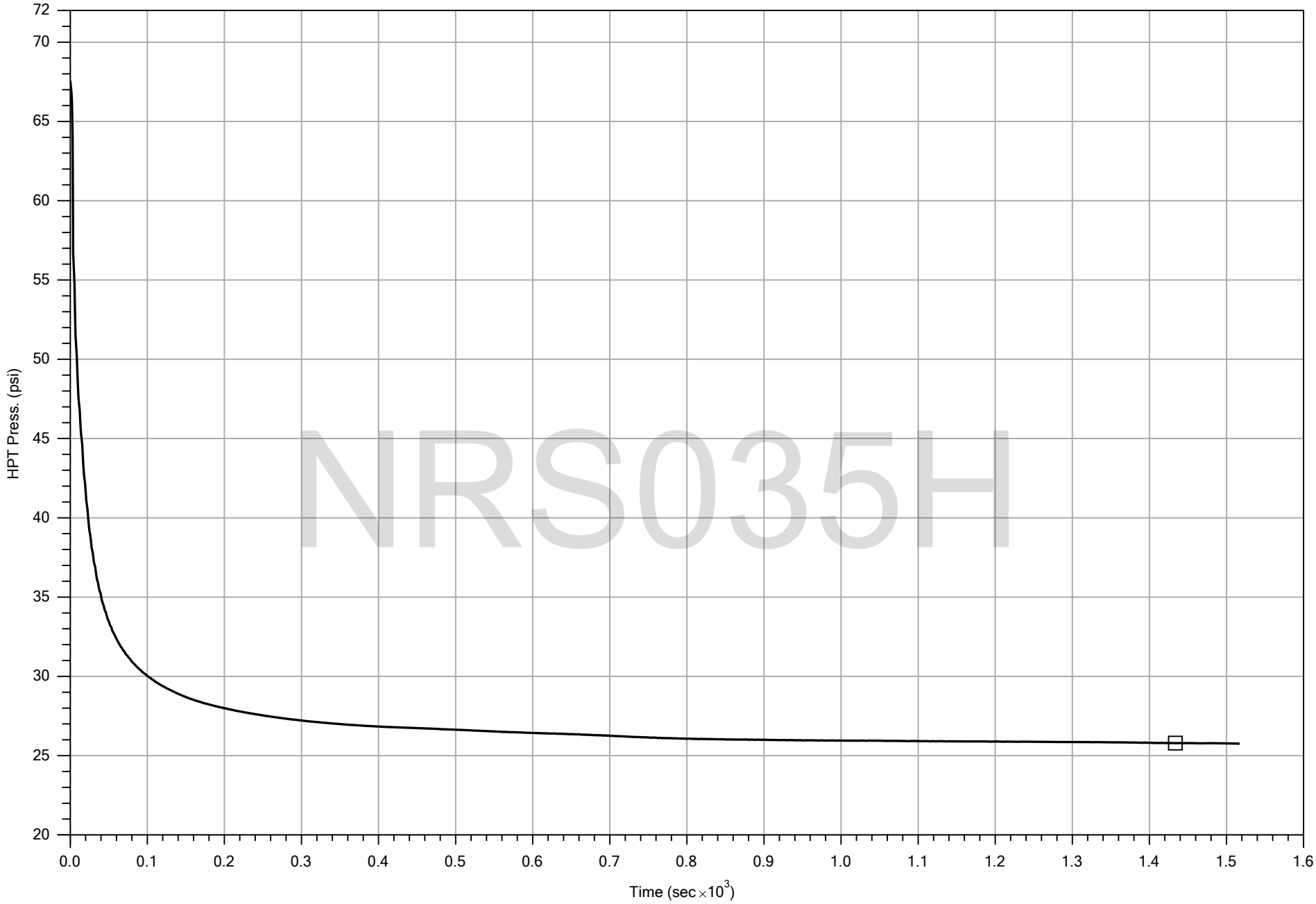
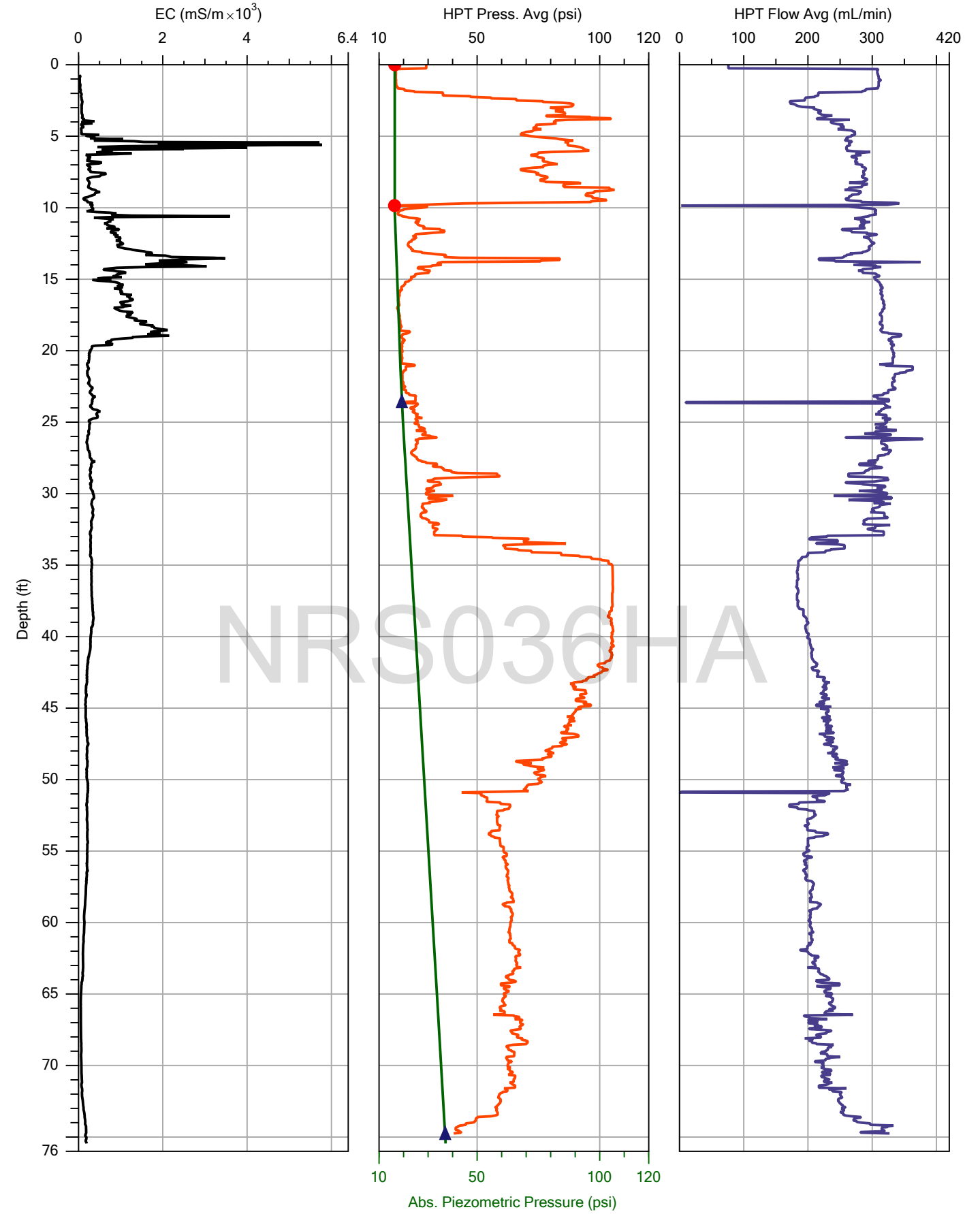
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS035H.DIS	Date: 6/25/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 9.00 ft	Test: 1

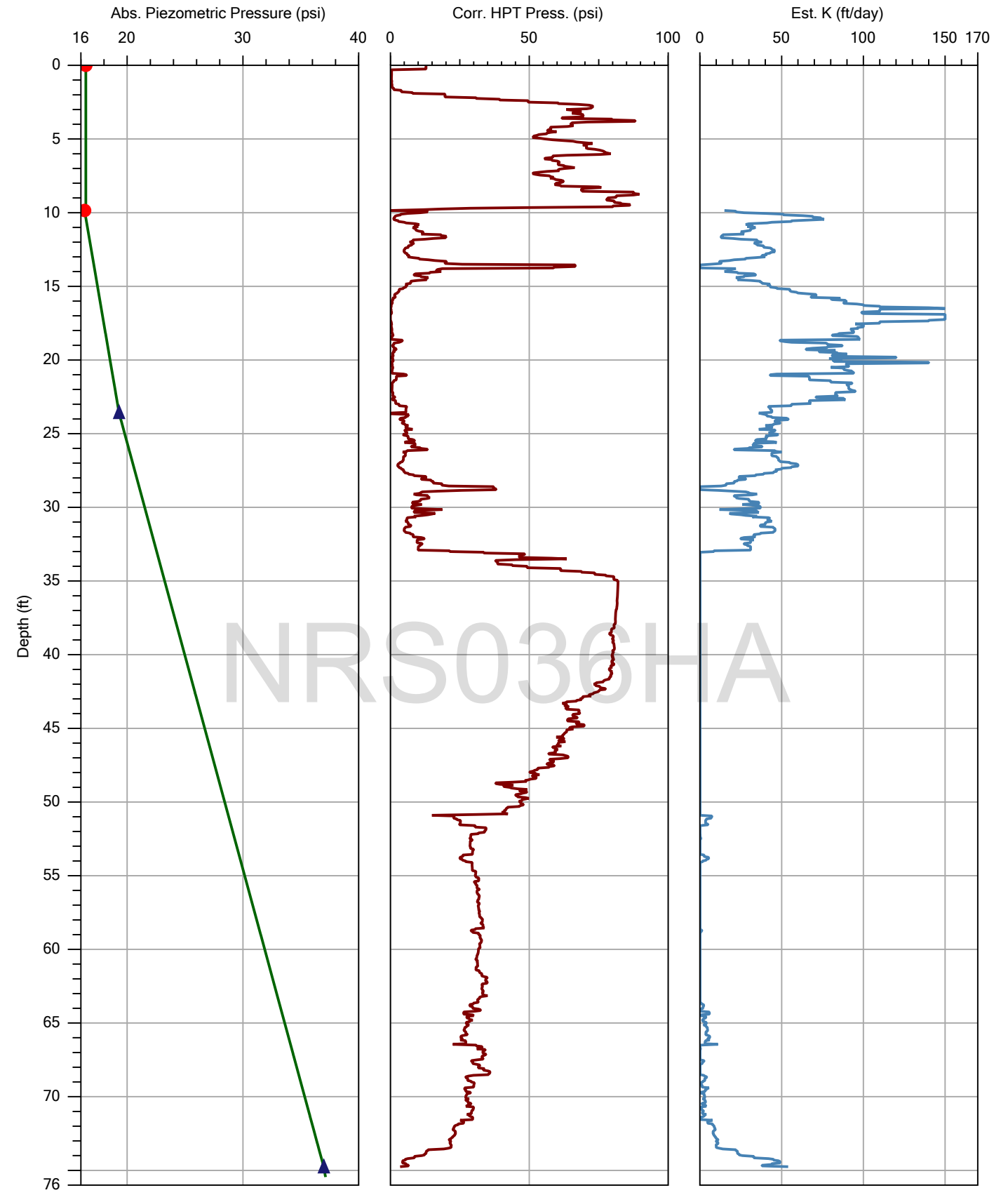


HPT DISSIPATION (SINGLE CASE)

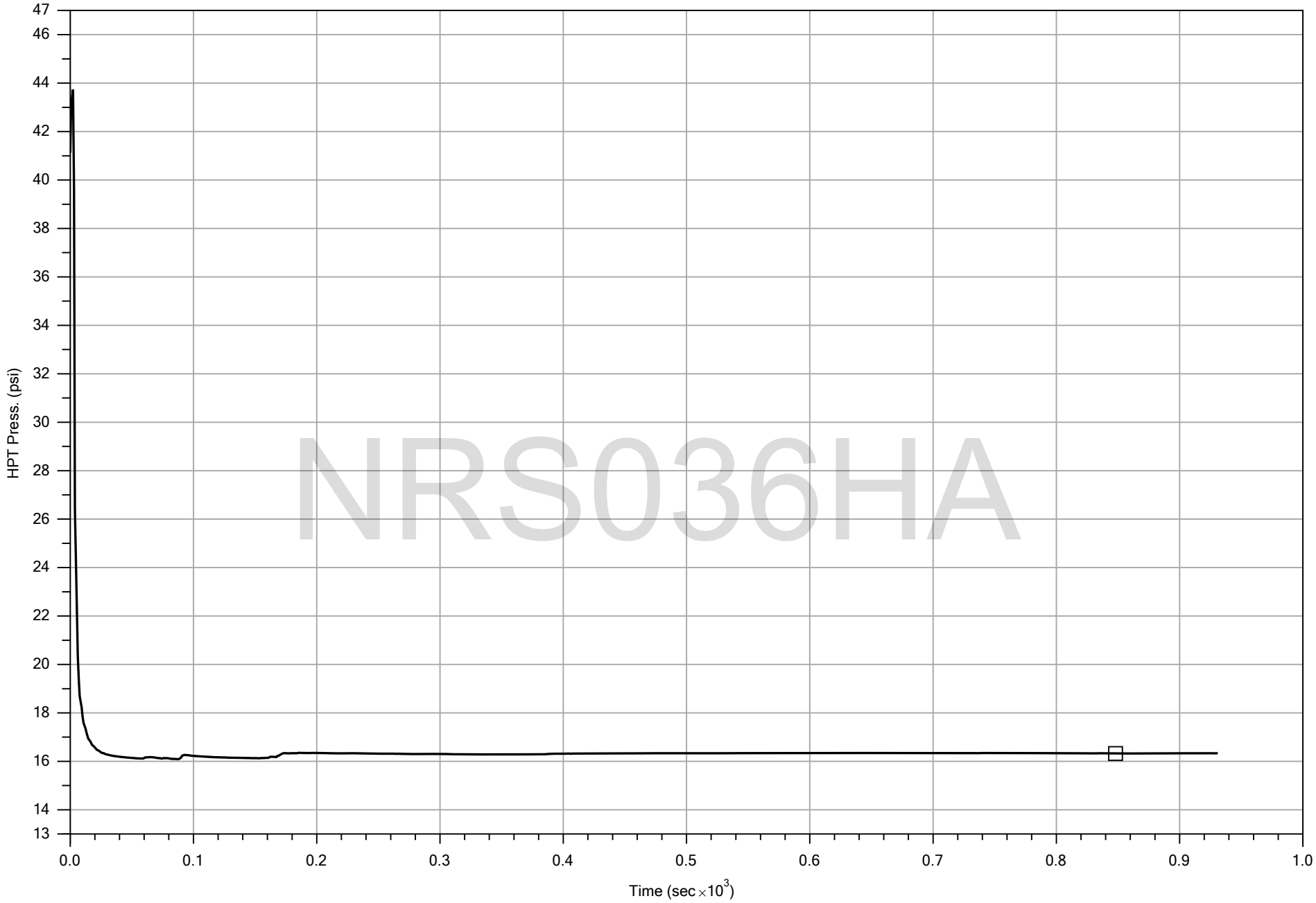
Company: ZTS	Operator: RR	File: NRS035H.DIS	Date: 6/25/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 46.30 ft	Test: 1



			File: NRS036HA.DAT
Company: ZTS	Operator: RR		Date: 6/25/2015
Project ID: TVA	Client: AECOM		Location:

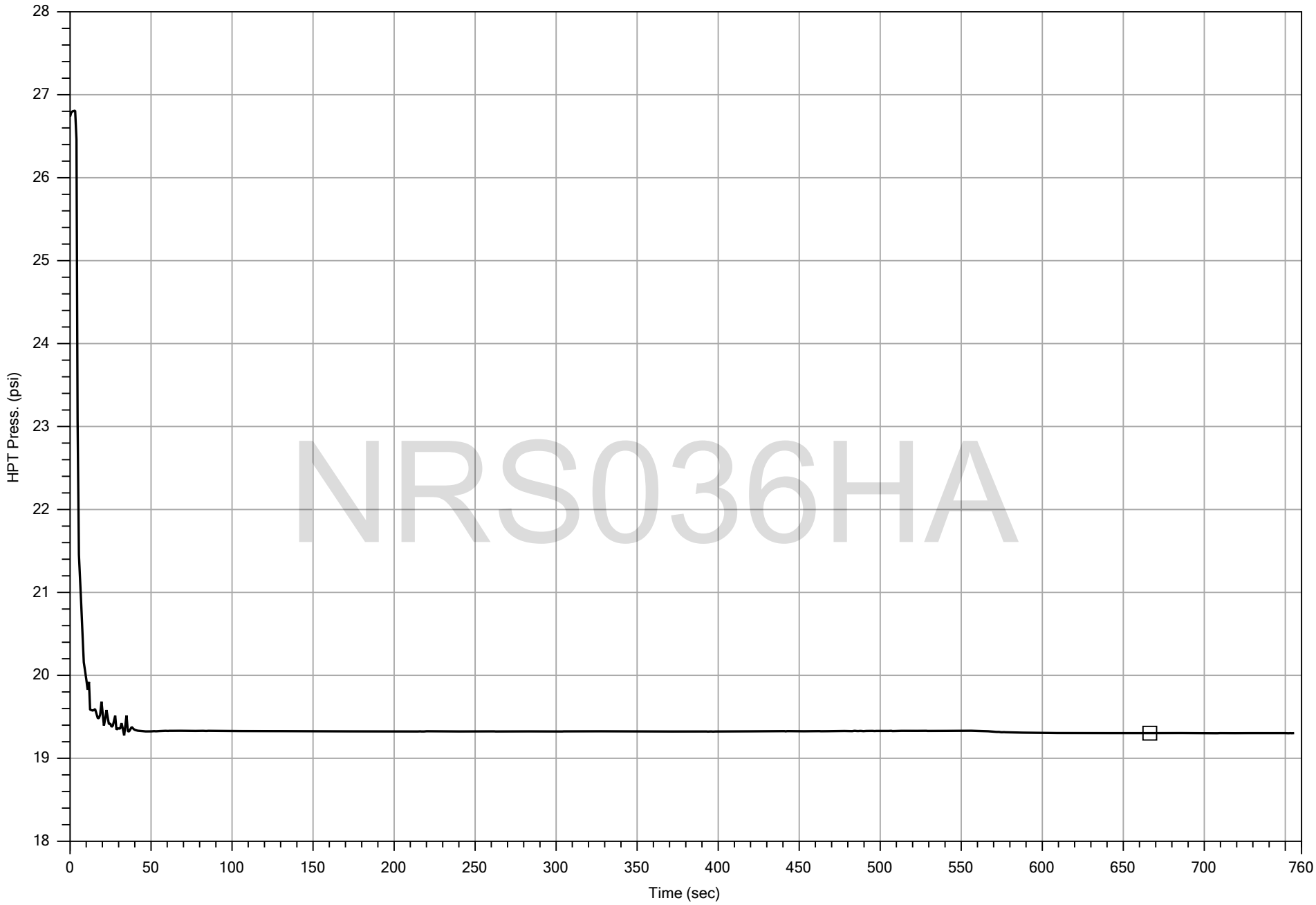


			File: NRS036HA.DAT
Company: ZTS	Operator: RR		Date: 6/25/2015
Project ID: TVA	Client: AECOM		Location:



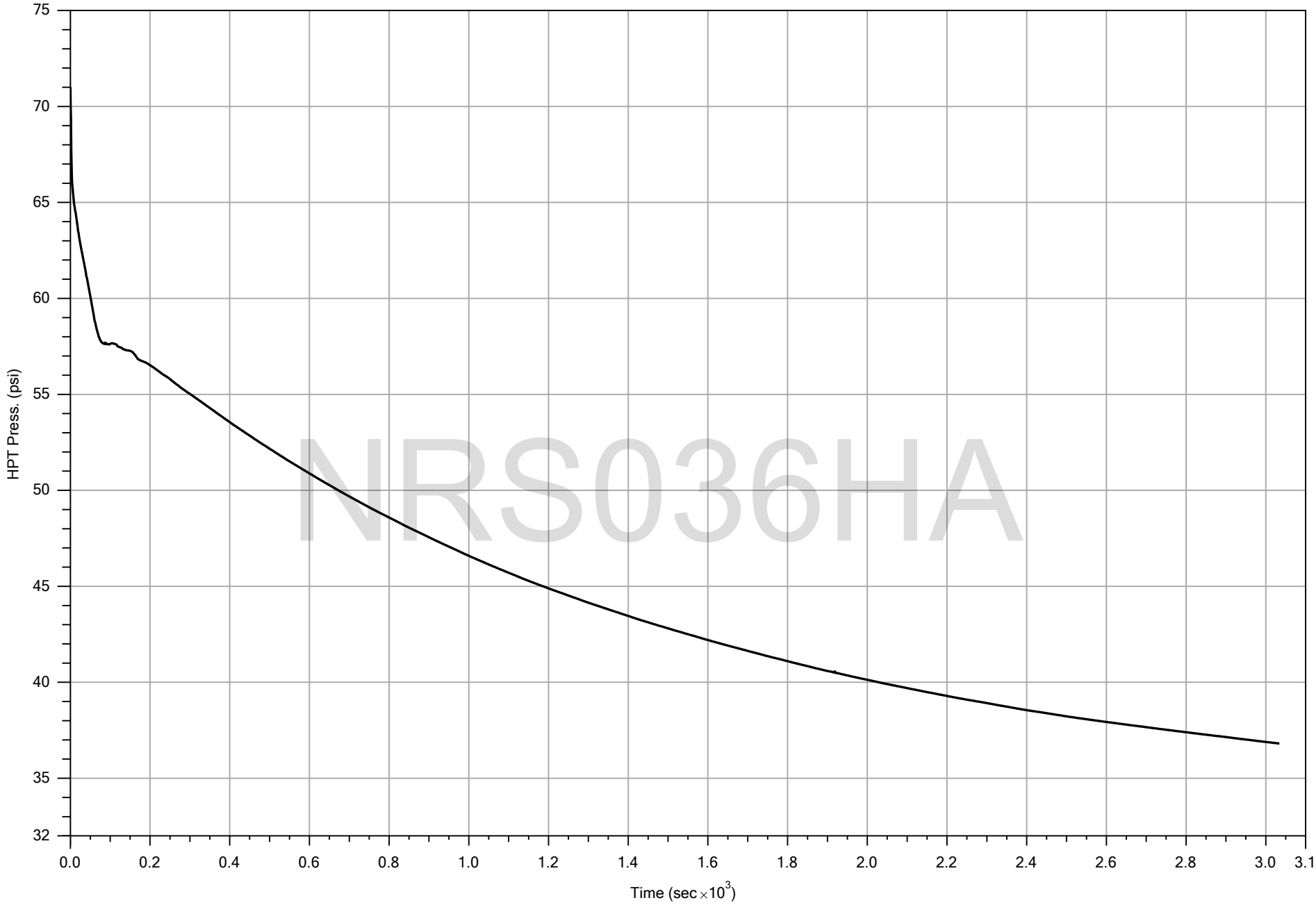
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 9.85 ft	Test: 1
		File: NRS036HA.DIS	Date: 6/25/2015



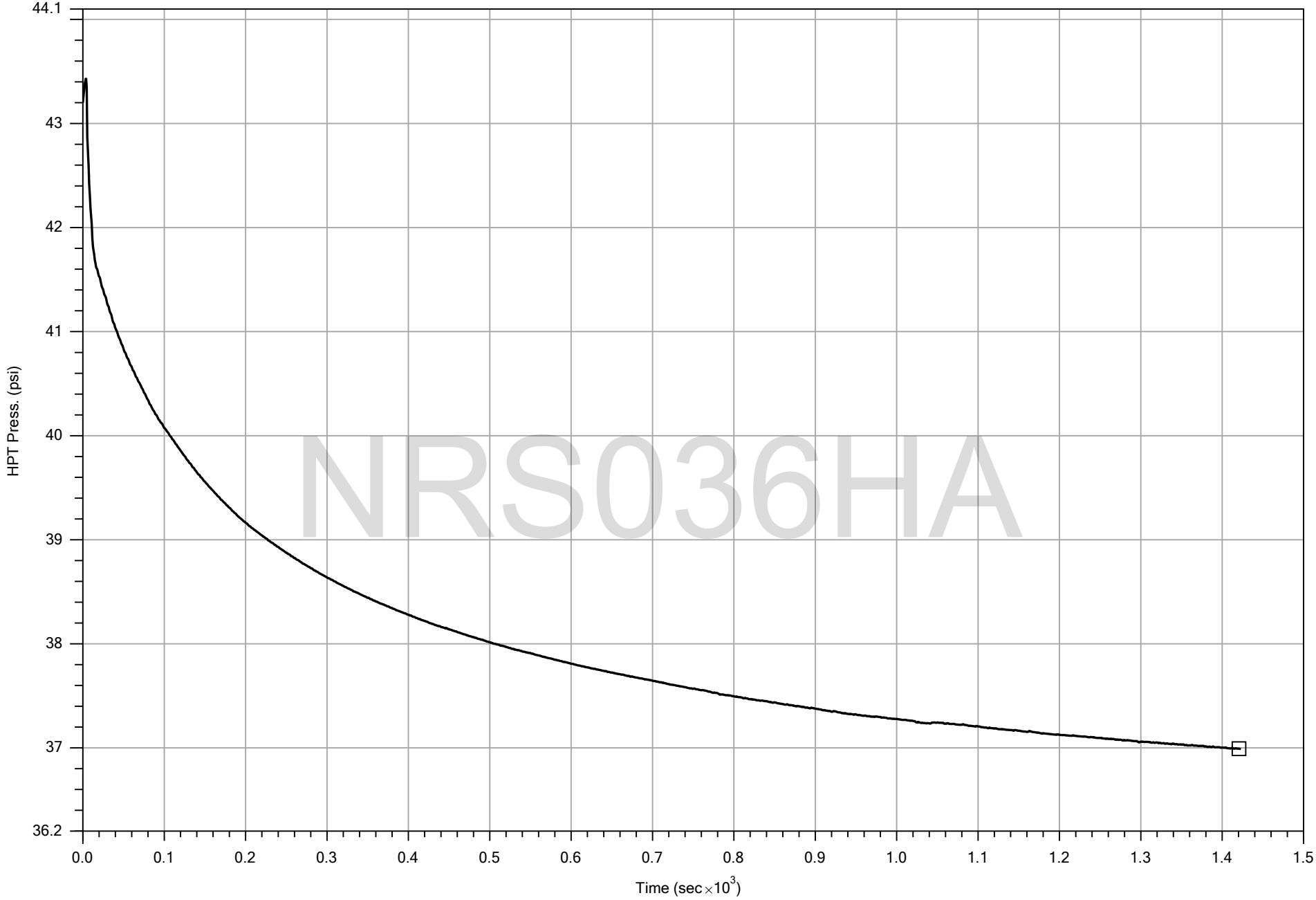
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 23.60 ft	Test: 1
File: NRS036HA.DIS			Date: 6/25/2015



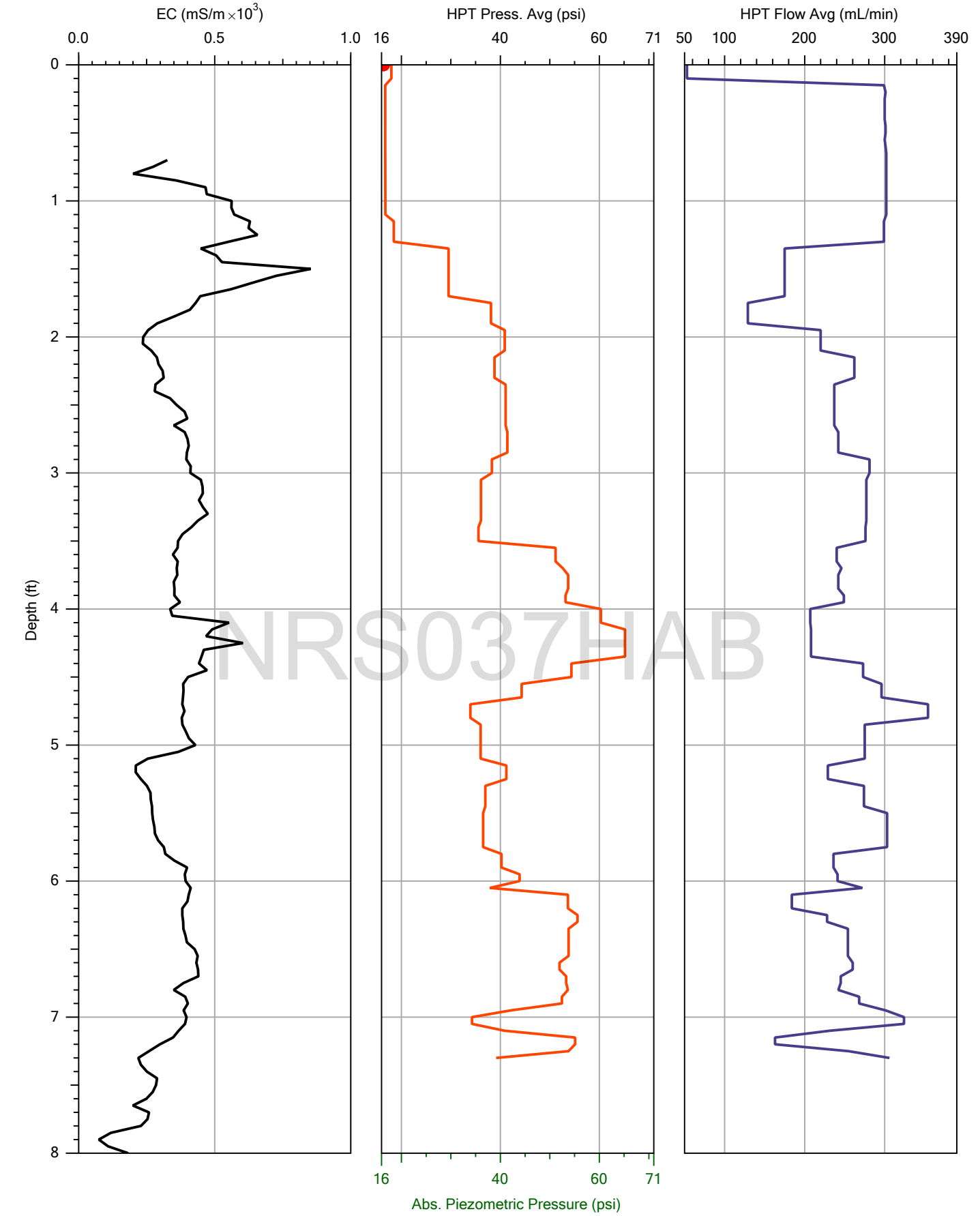
HPT DISSIPATION (SINGLE CASE)

		File: NRS036HA.DIS	Date: 6/25/2015
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 50.80 ft	Test: 1

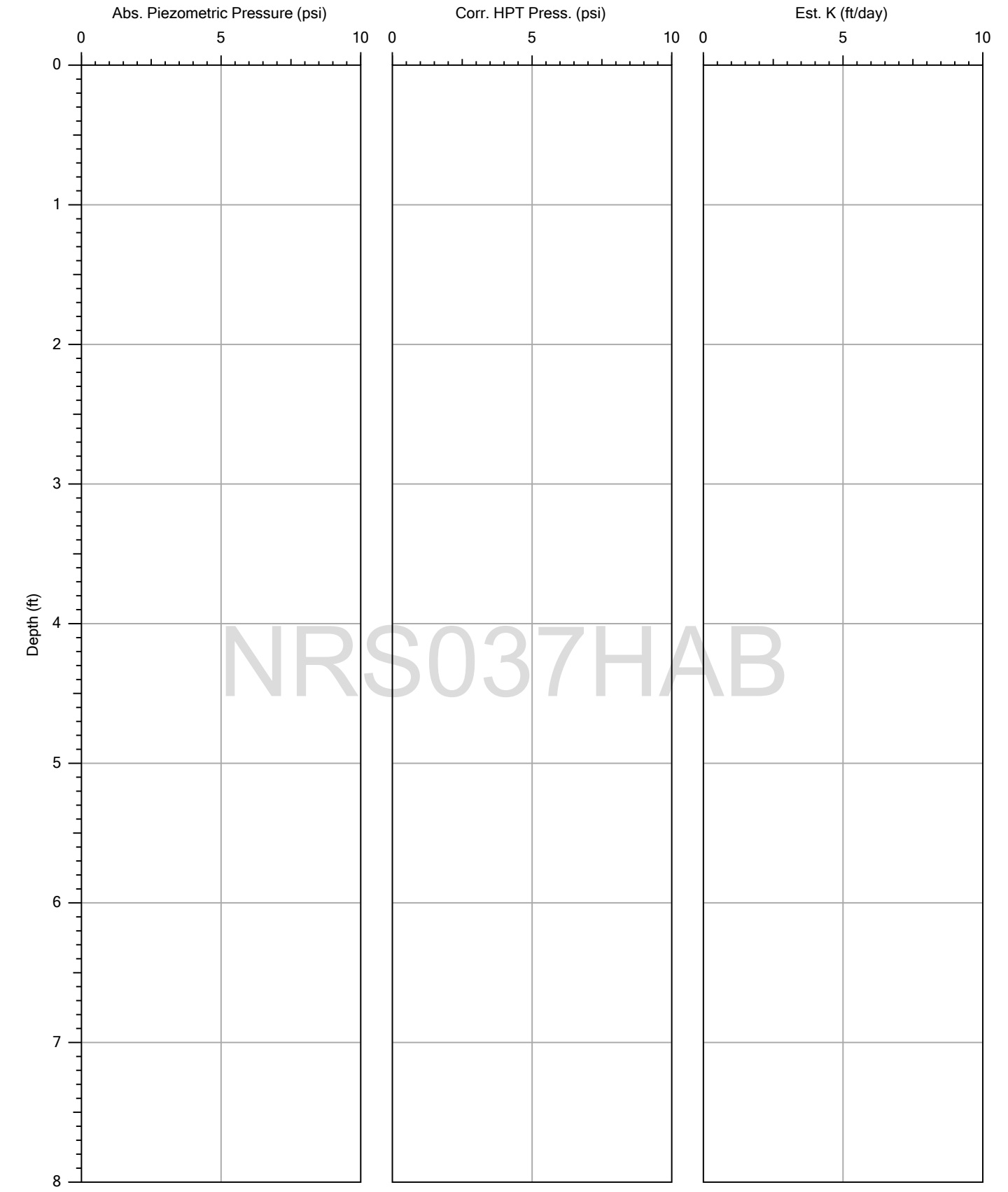


HPT DISSIPATION (SINGLE CASE)

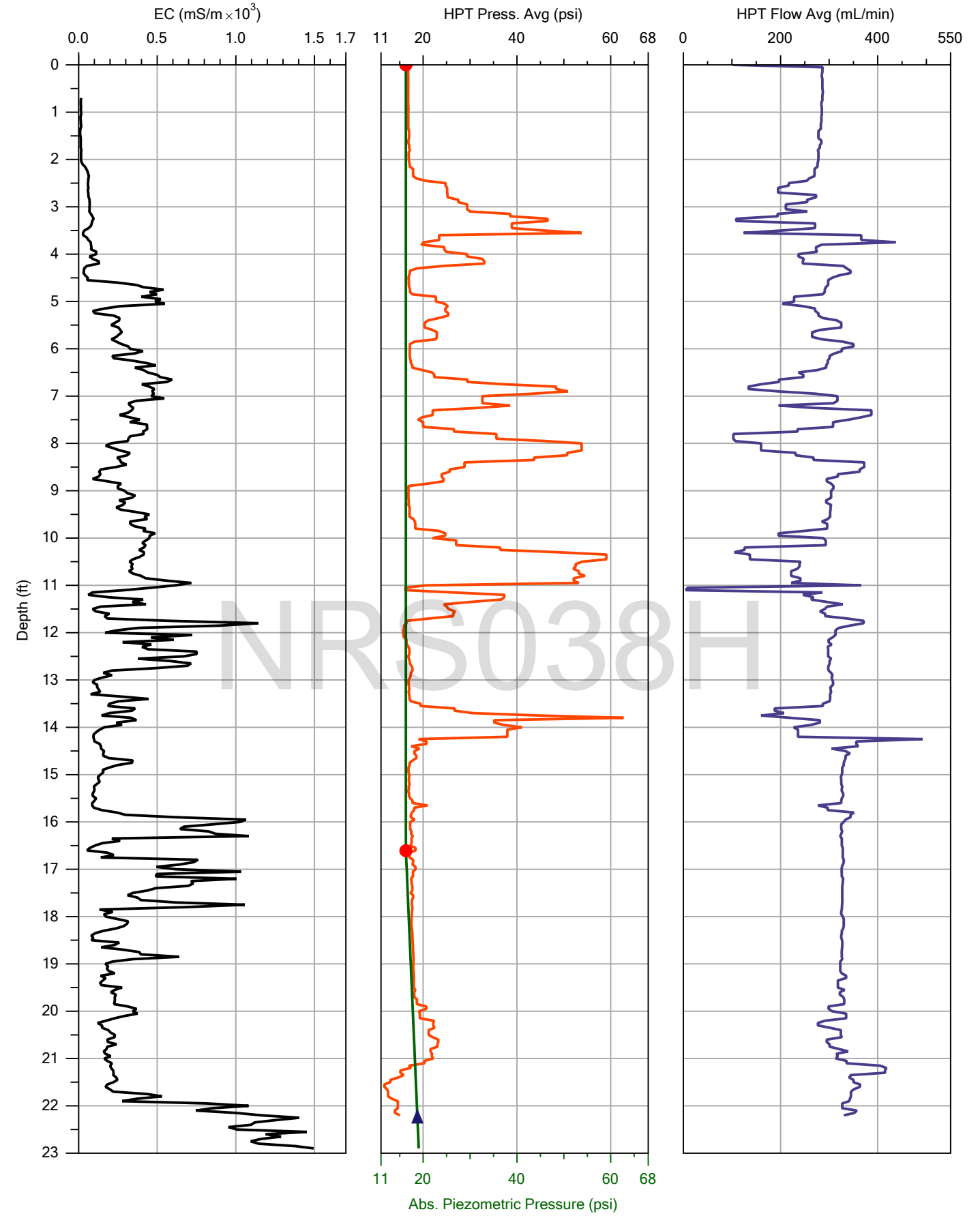
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 74.80 ft	Test: 1
File: NRS036HA.DIS			Date: 6/25/2015



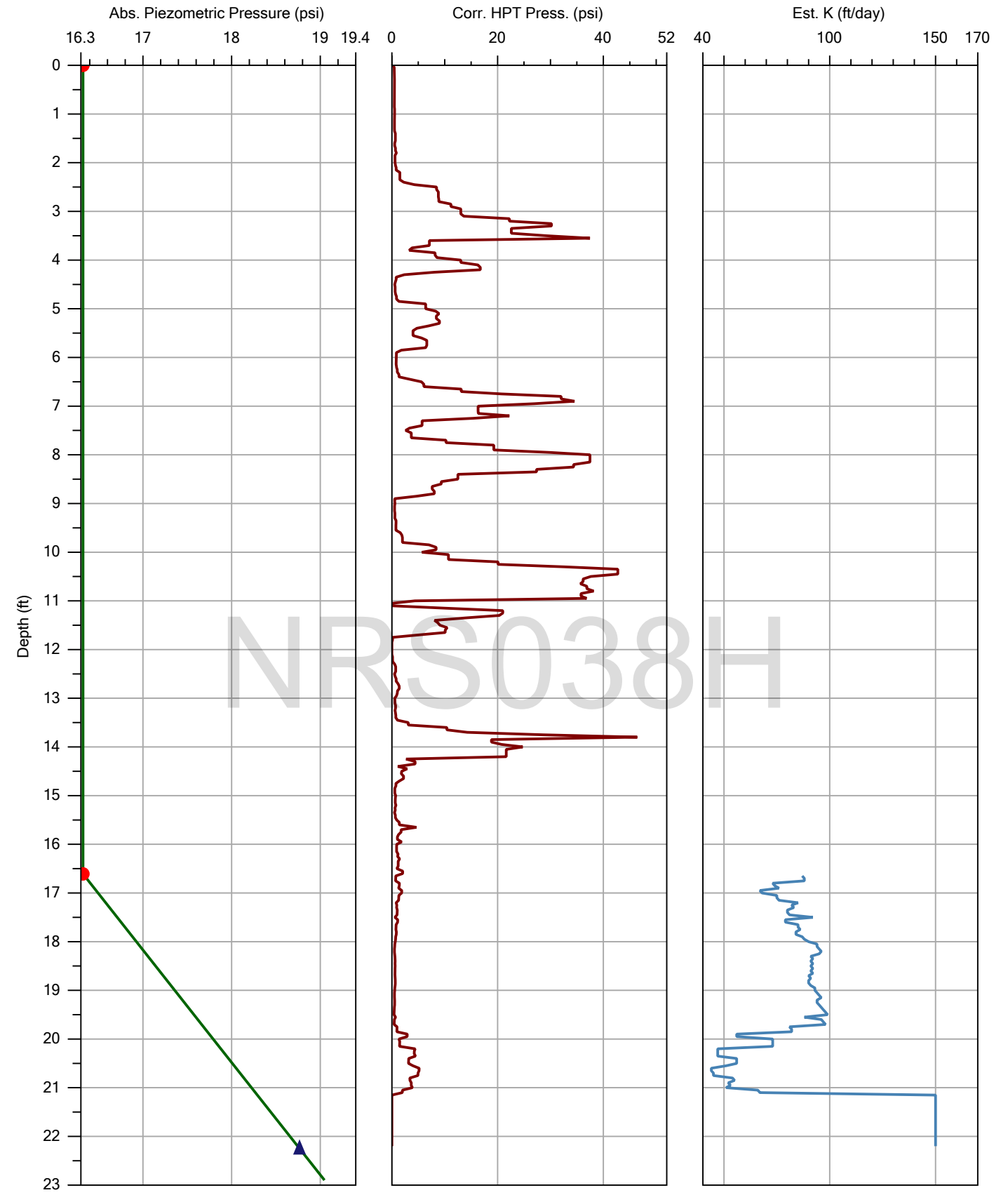
			File: NRS037HB.DAT
Company: ZTS	Operator: RR		Date: 6/25/2015
Project ID: TVA	Client: AECOM		Location:



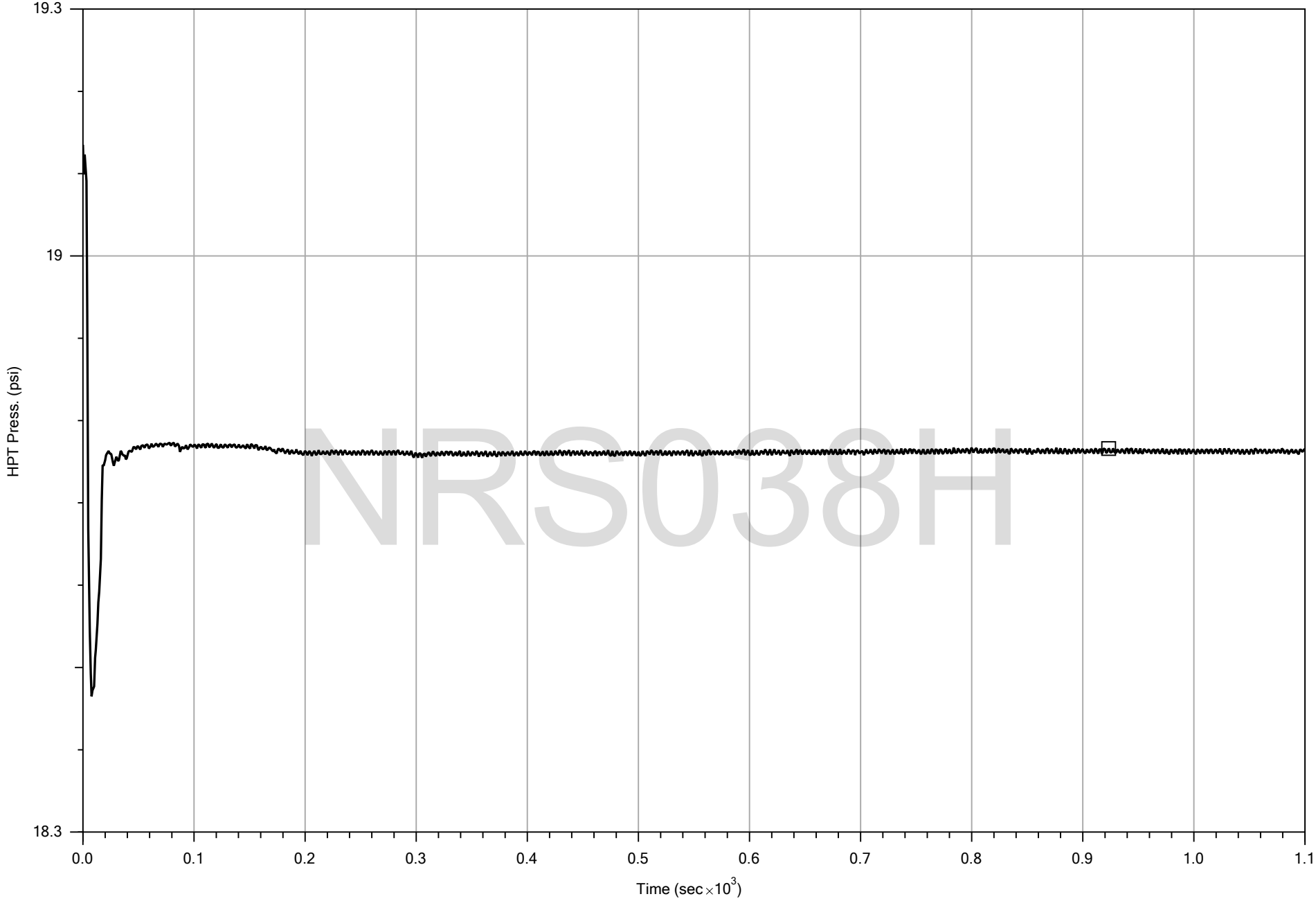
			File: NRS037HB.DAT
Company: ZTS	Operator: RR		Date: 6/25/2015
Project ID: TVA	Client: AECOM		Location:



			File: NRS038H.DAT
Company: ZTS	Operator: RR		Date: 6/26/2015
Project ID: TVA	Client: AECOM		Location:

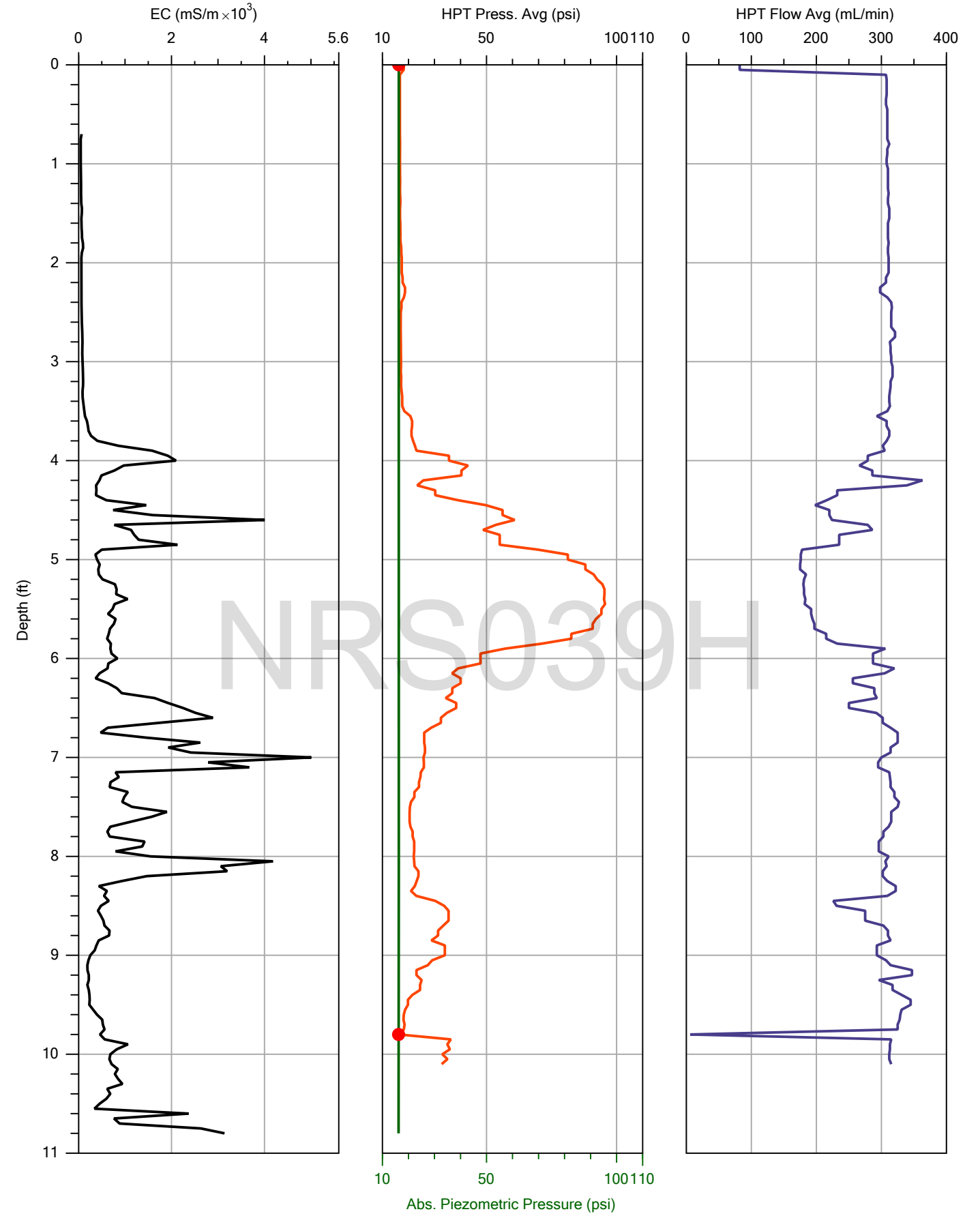


			File: NRS038H.DAT
Company: ZTS	Operator: RR		Date: 6/26/2015
Project ID: TVA	Client: AECOM		Location:

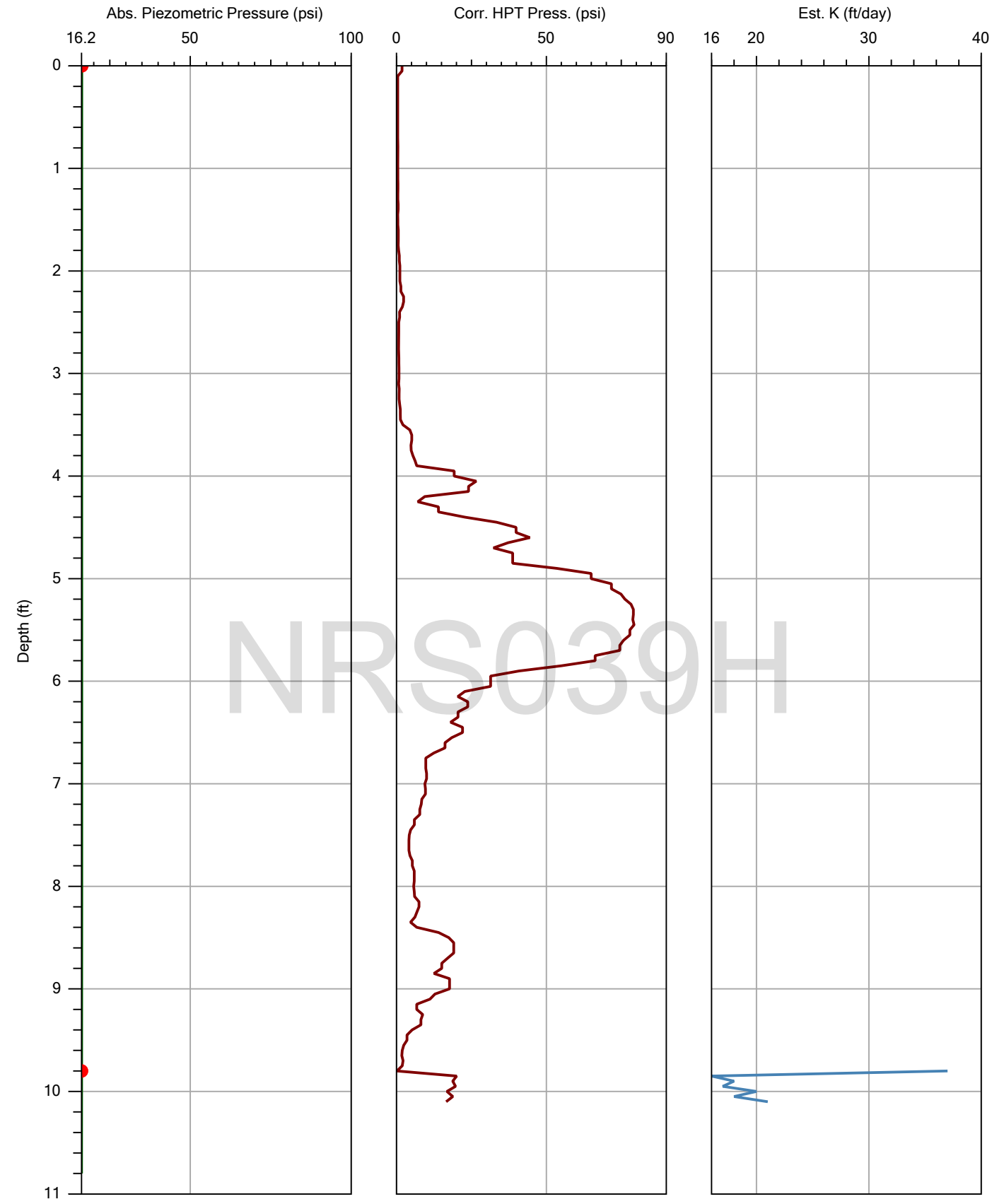


HPT DISSIPATION (SINGLE CASE)

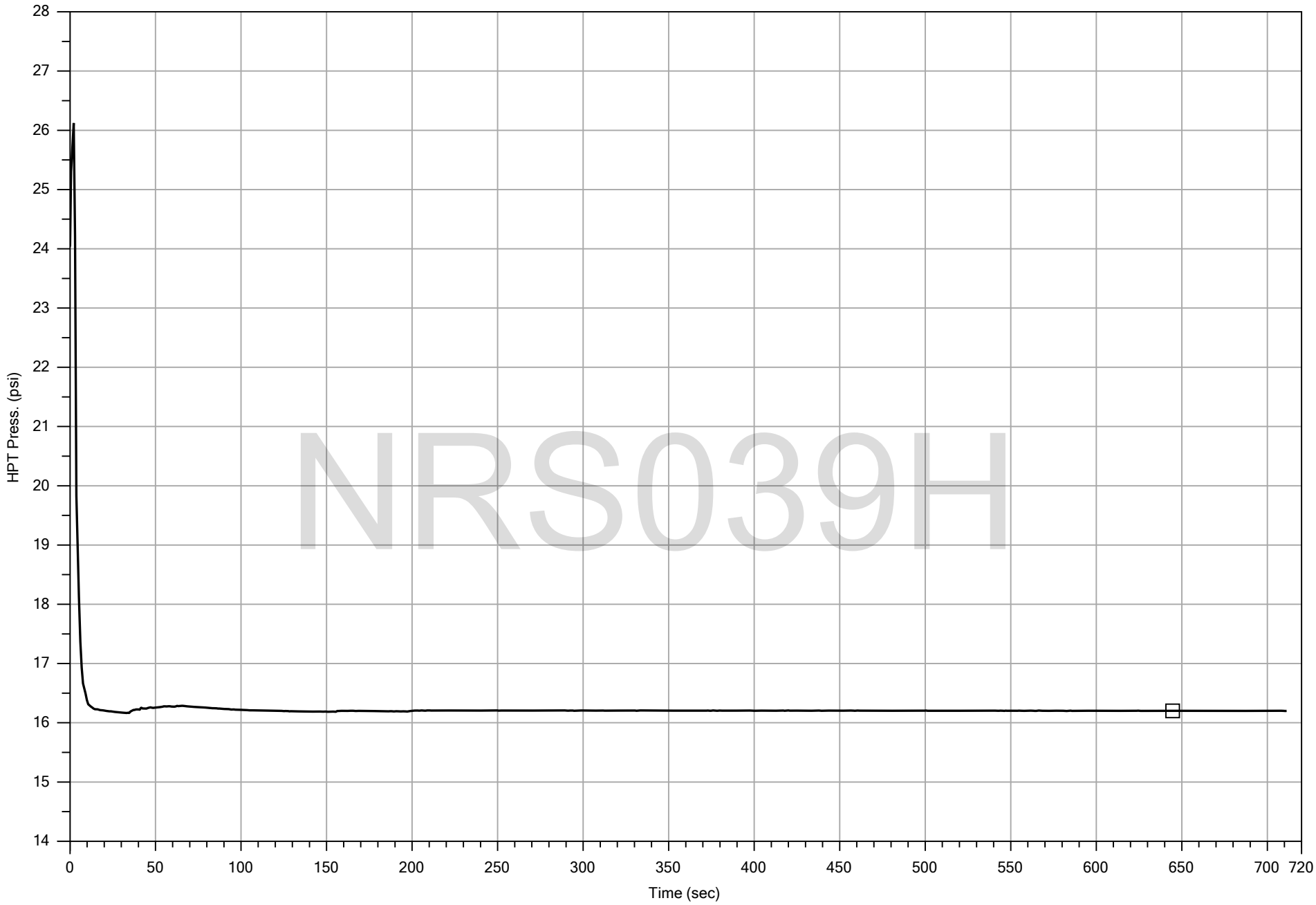
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 22.25 ft	Test: 1
		File: NRS038H.DIS	Date: 6/26/2015



			File: NRS039H.DAT
Company: ZTS		Operator: RR	Date: 6/26/2015
Project ID: TVA		Client: AECOM	Location:



			File: NRS039H.DAT
Company: ZTS	Operator: RR		Date: 6/26/2015
Project ID: TVA	Client: AECOM		Location:



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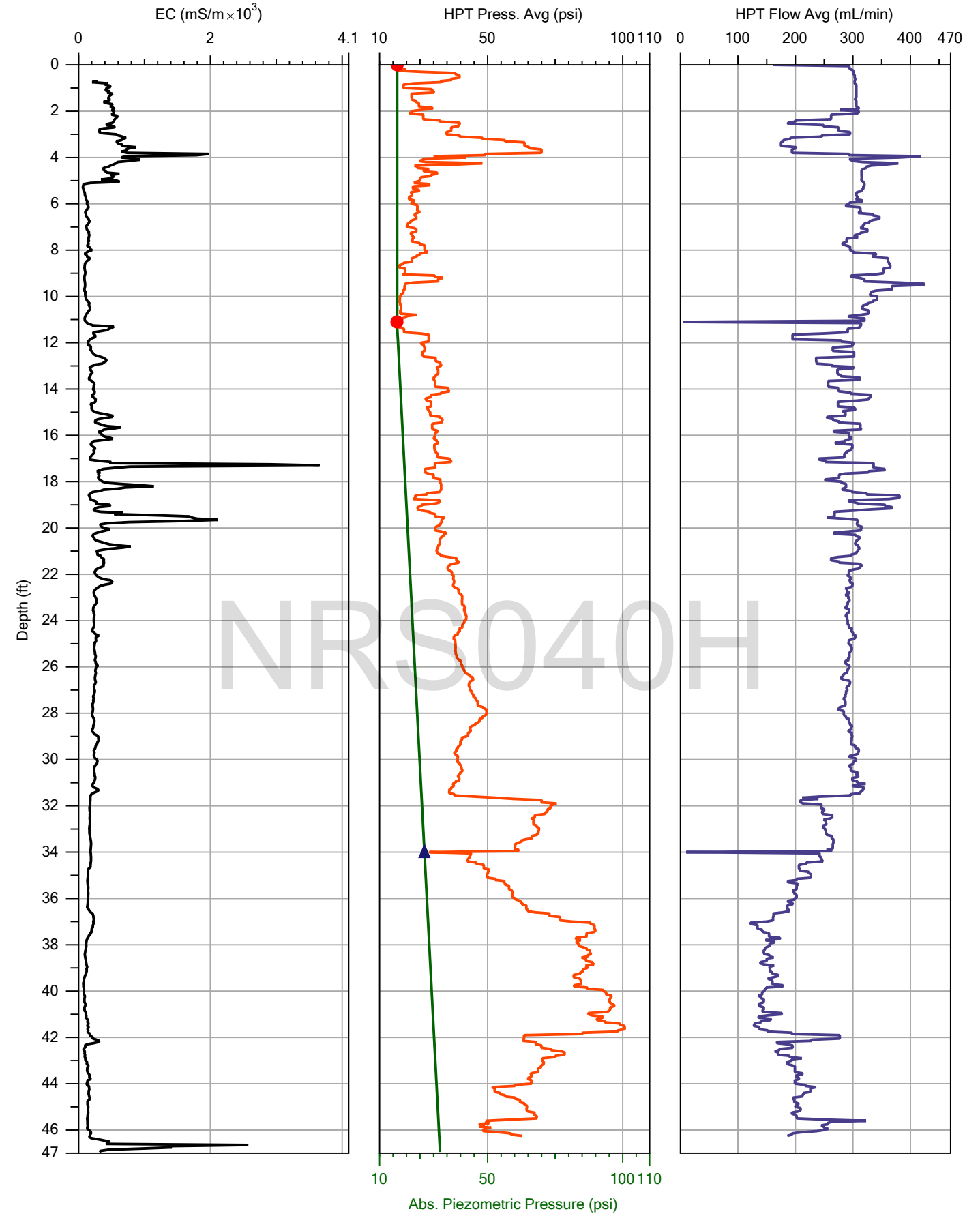
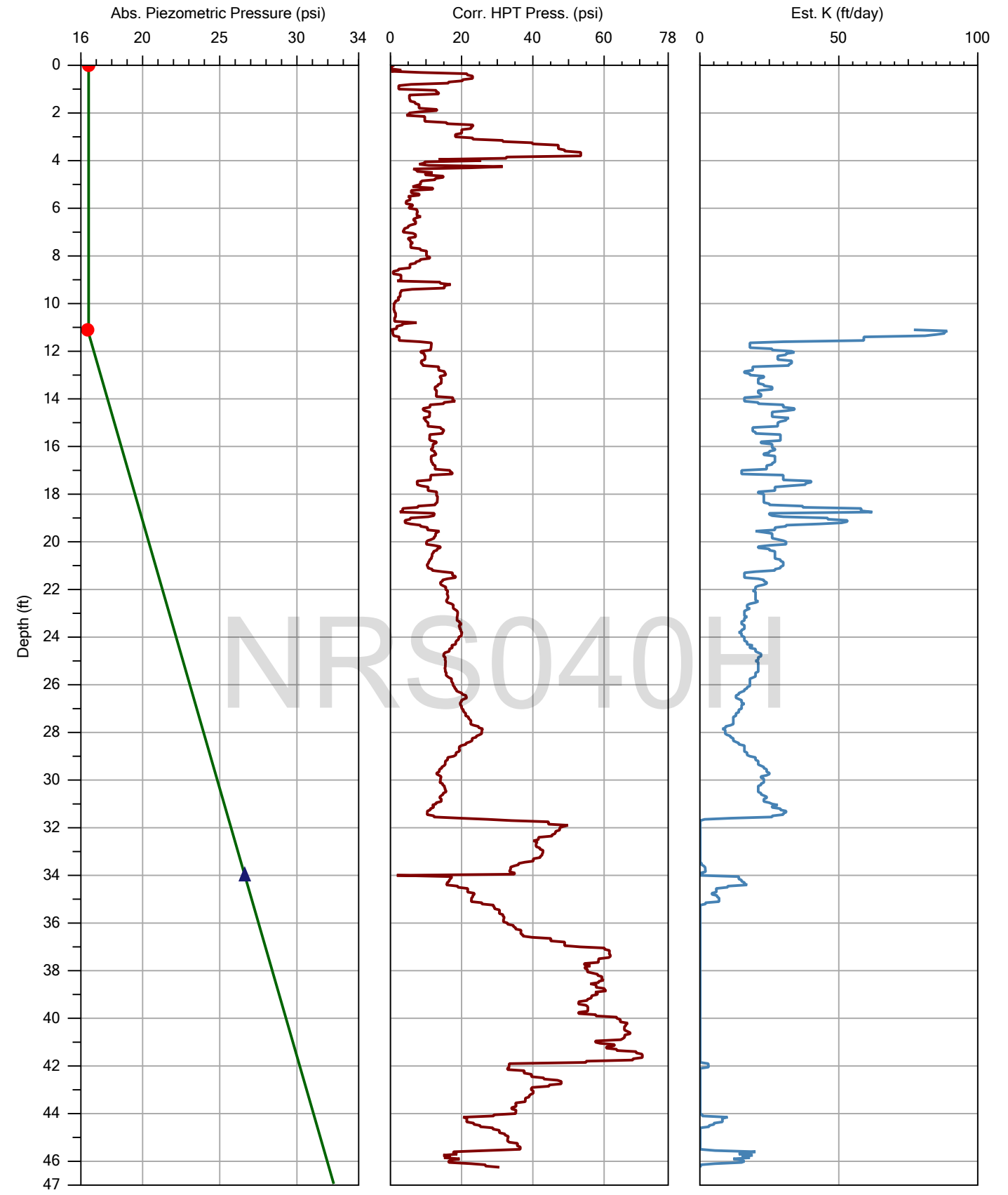
HPT DISSIPATION (SINGLE CASE)

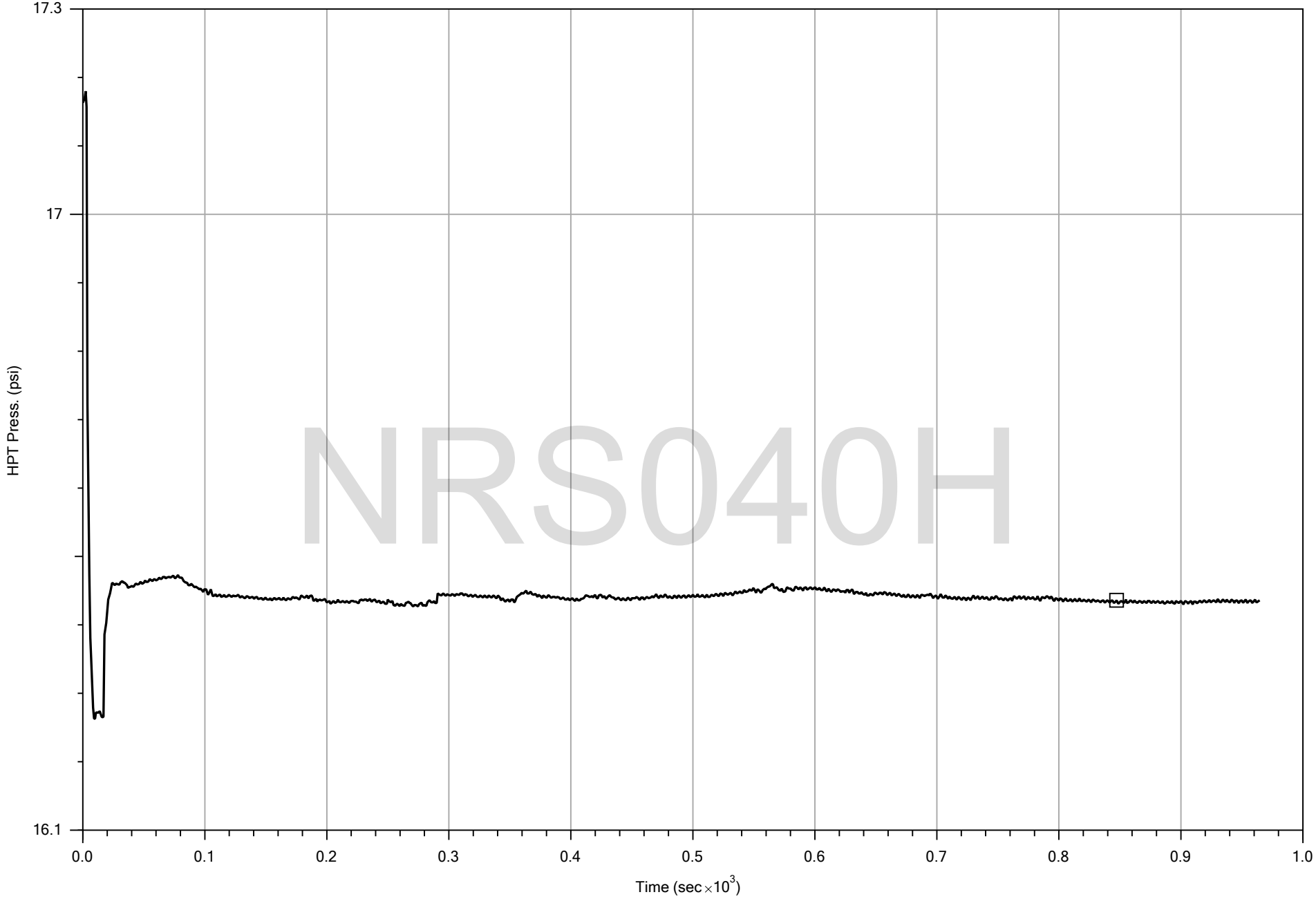
Company: ZTS	Operator: RR	File: NRS039H.DIS	Date: 6/26/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 9.80 ft	Test: 1



			File: NRS040H.DAT
Company: ZTS	Operator: RR		Date: 6/26/2015
Project ID: TVA	Client: AECOM		Location:

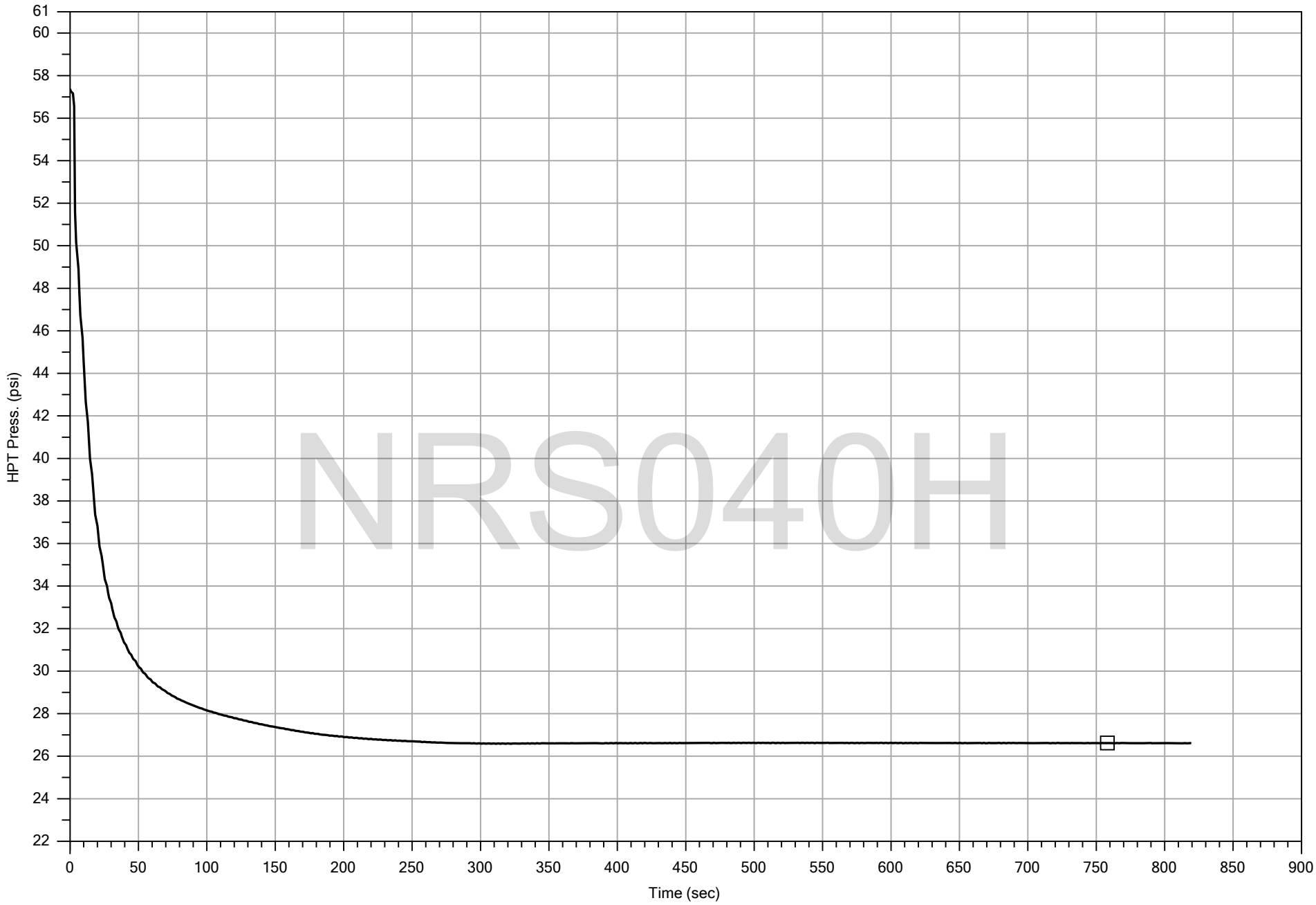


			File: NRS040H.DAT
Company: ZTS	Operator: RR		Date: 6/26/2015
Project ID: TVA	Client: AECOM		Location:



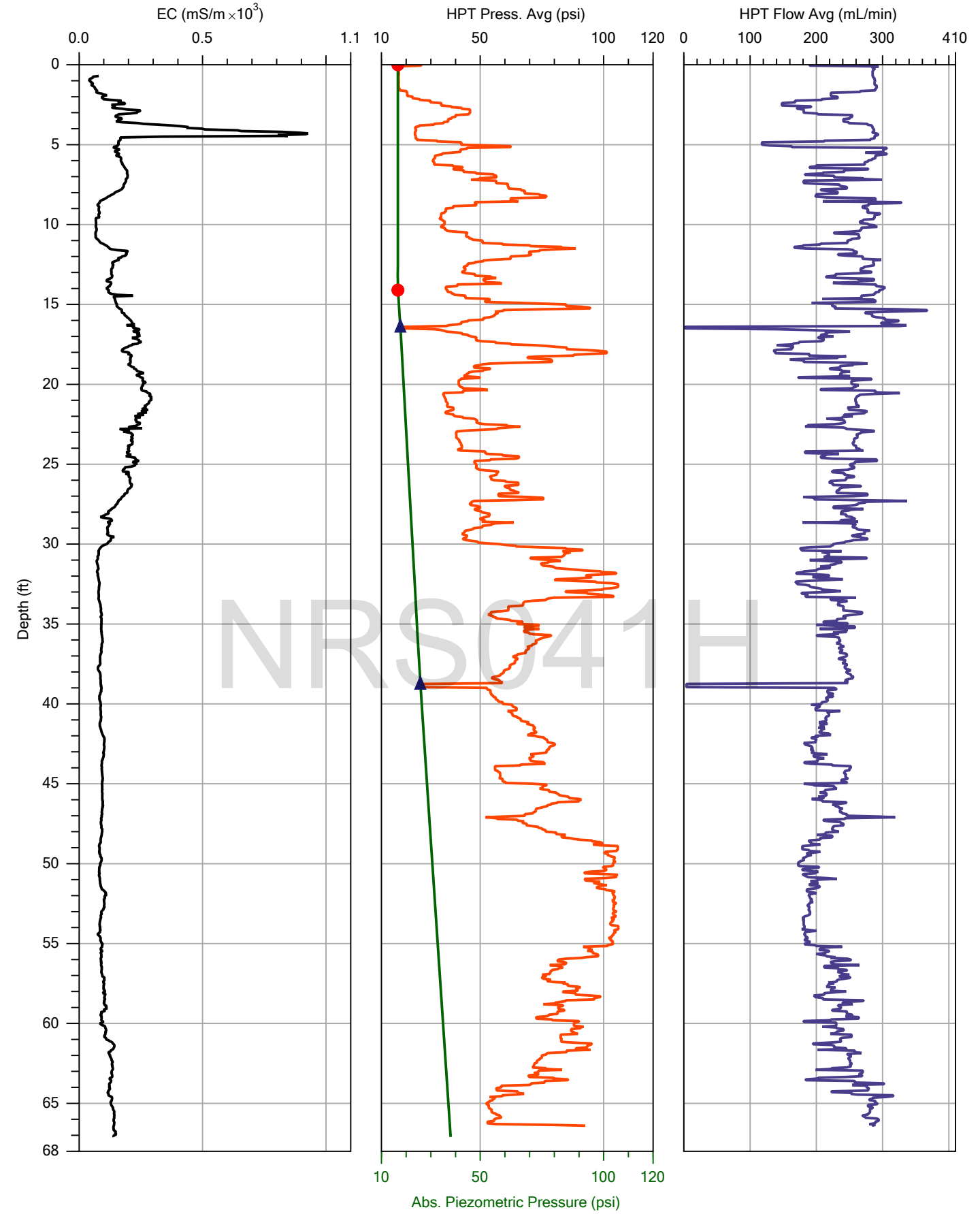
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 11.10 ft	Test: 1
File: NRS040H.DIS			Date: 6/26/2015

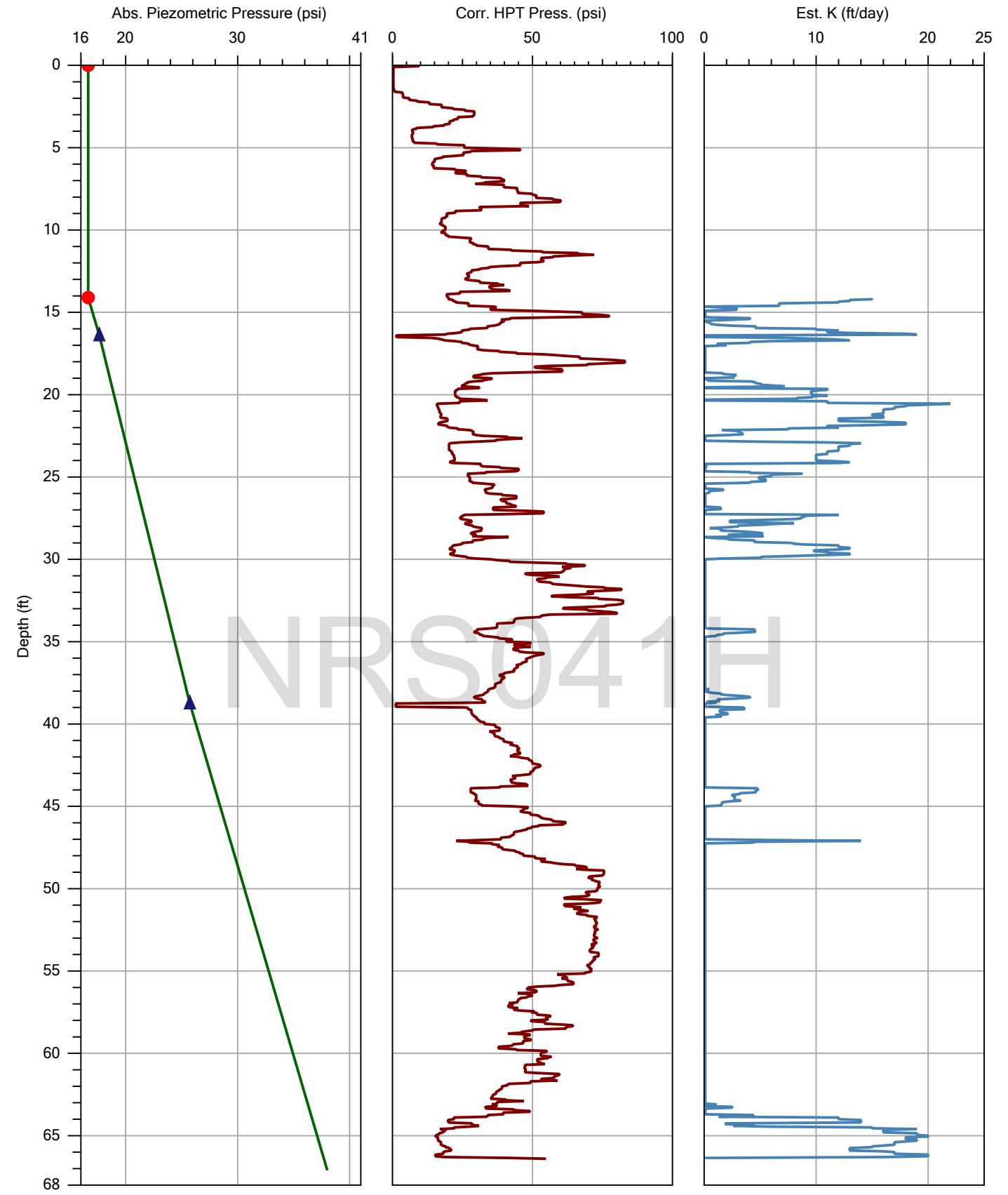


HPT DISSIPATION (SINGLE CASE)

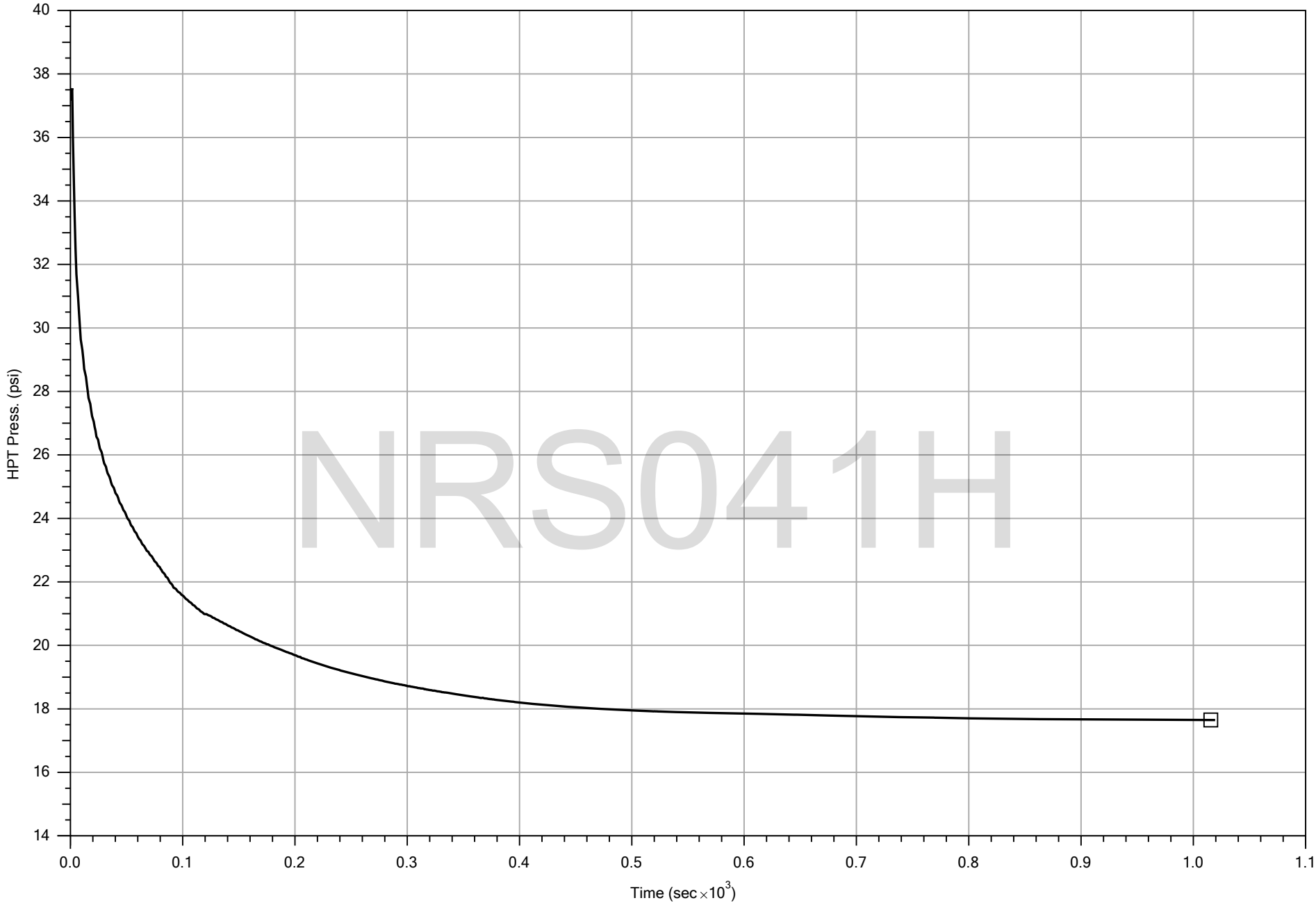
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 34.00 ft	Test: 1
		File: NRS040H.DIS	Date: 6/26/2015



			File: NRS041.DAT
Company: ZTS	Operator: RR		Date: 6/26/2015
Project ID: TVA	Client: AECOM		Location:

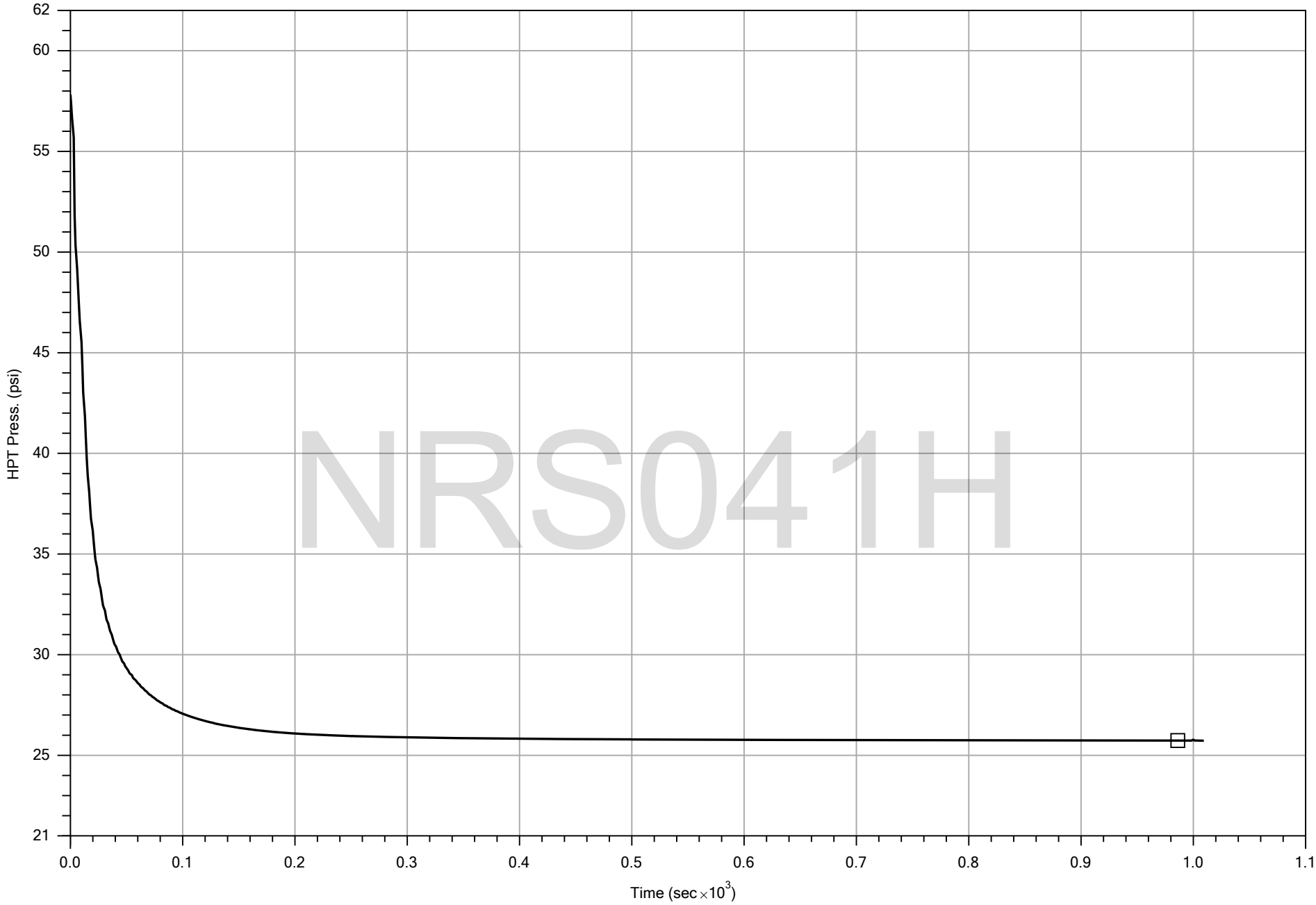


			File: NRS041.DAT
Company: ZTS	Operator: RR		Date: 6/26/2015
Project ID: TVA	Client: AECOM		Location:



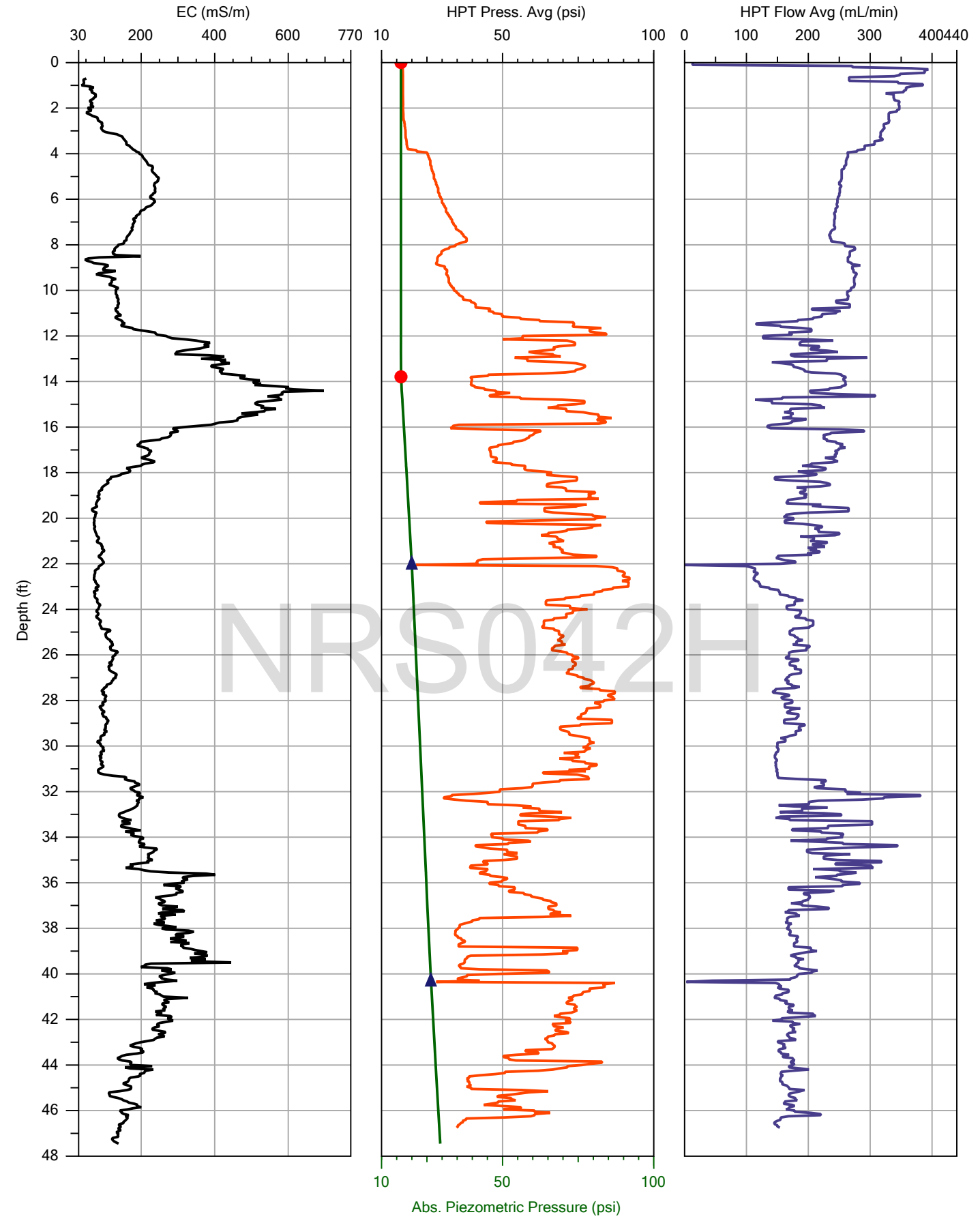
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS041.DIS	Date: 6/26/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 16.40 ft	Test: 1

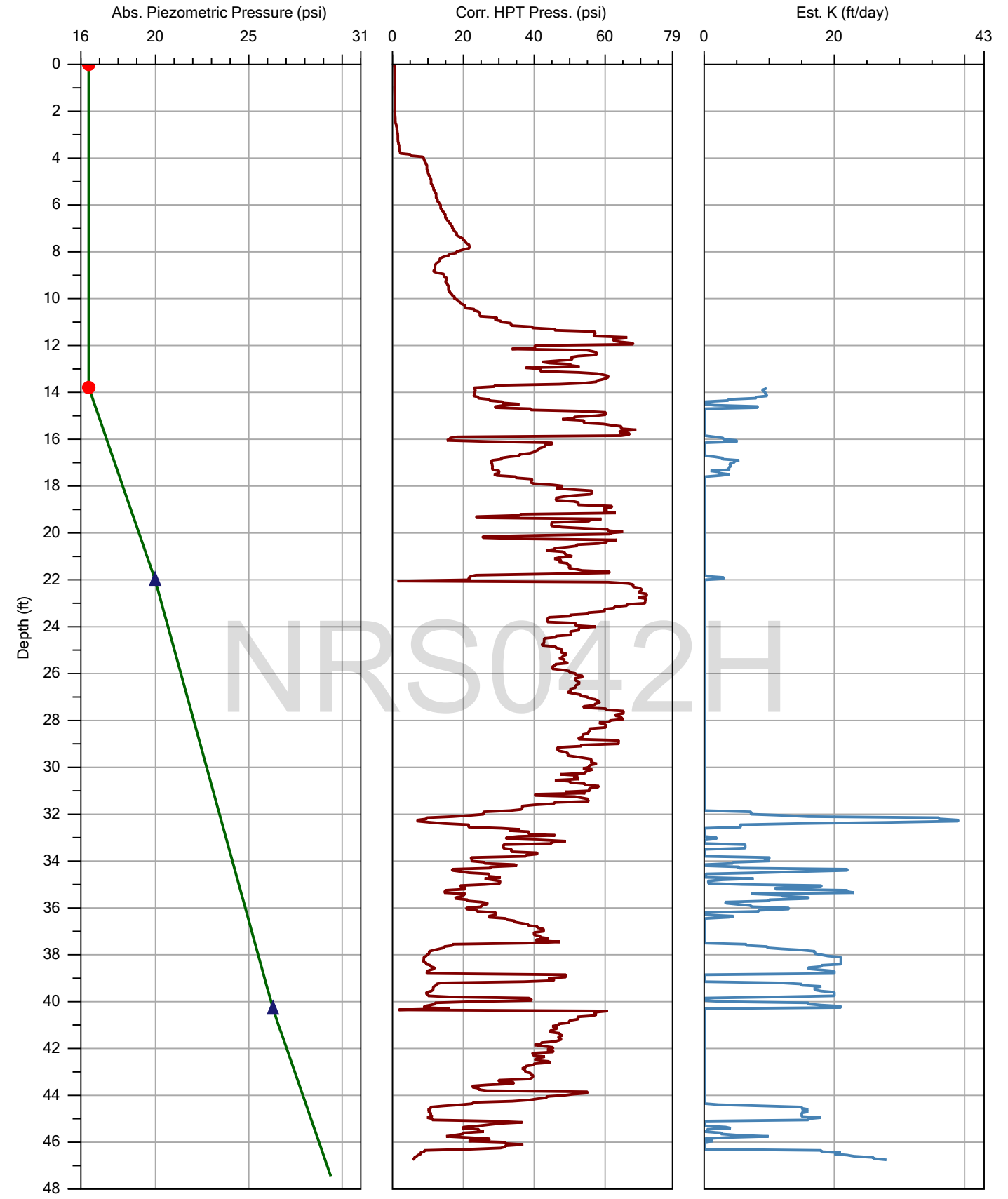


HPT DISSIPATION (SINGLE CASE)

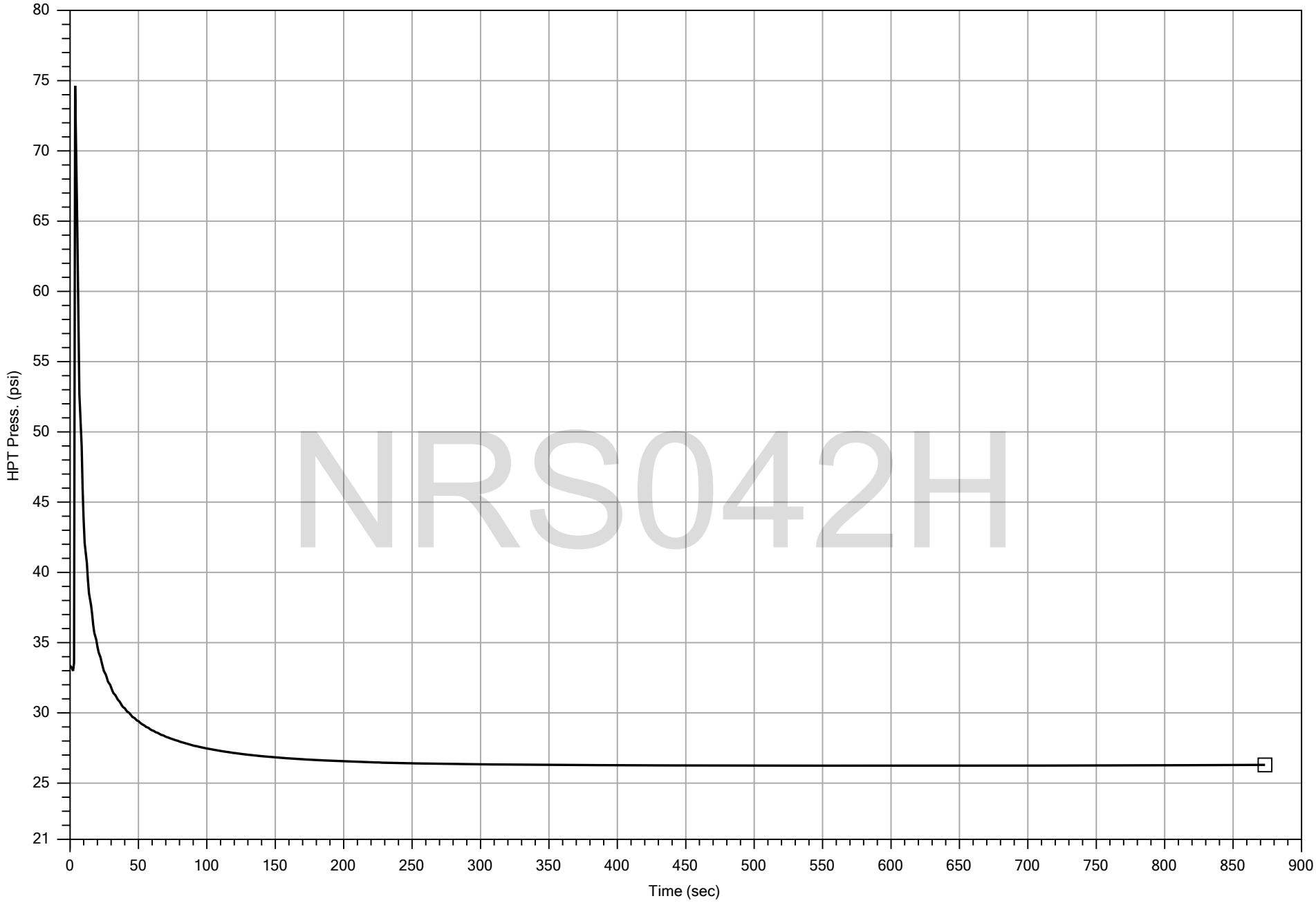
Company: ZTS	Operator: RR	File: NRS041.DIS	Date: 6/26/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 38.75 ft	Test: 1



		File: NRS042H.DAT
Company: ZTS	Operator: RR	Date: 6/26/2015
Project ID: TVA	Client: AECOM	Location:

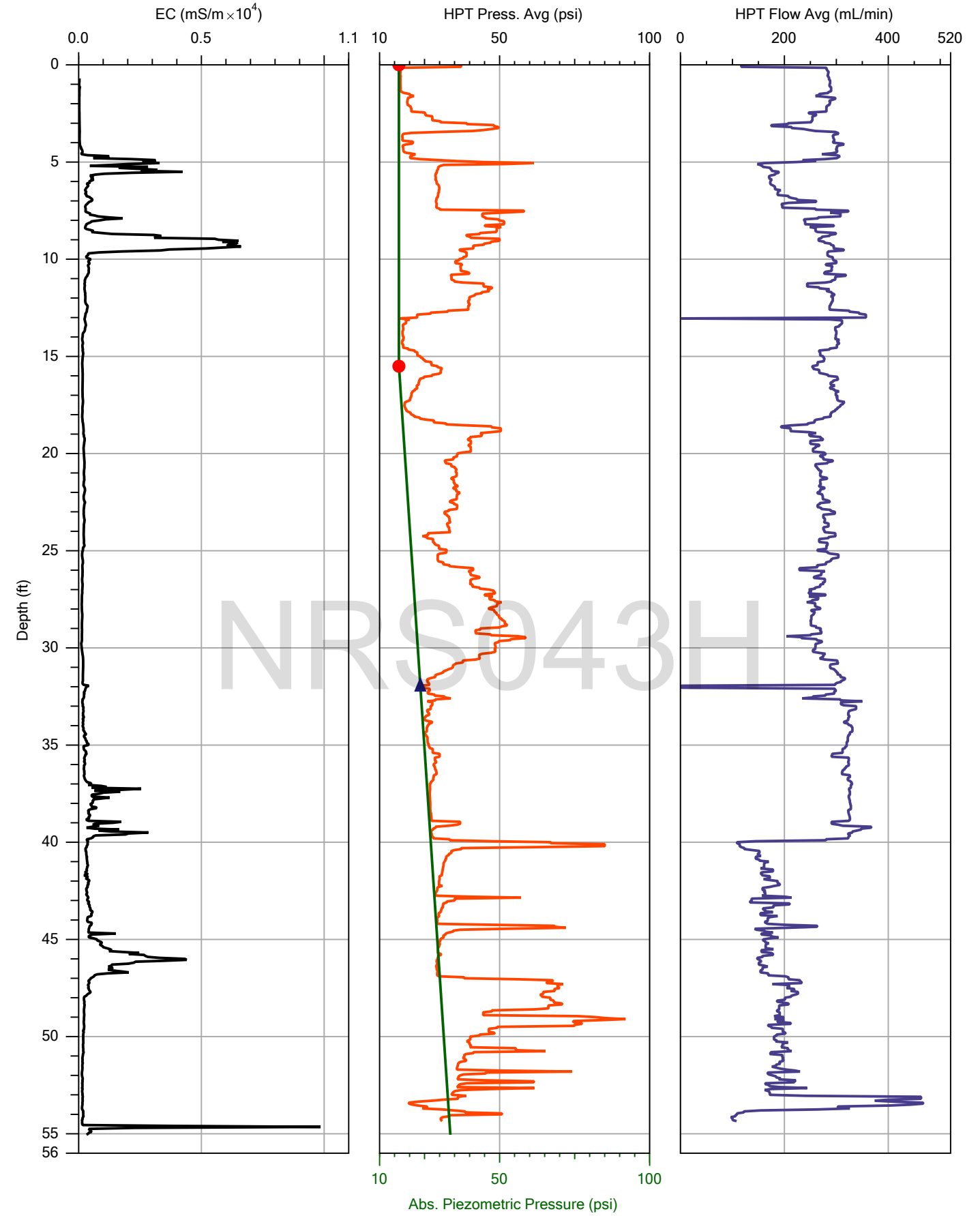


			File: NRS042H.DAT
Company: ZTS	Operator: RR		Date: 6/26/2015
Project ID: TVA	Client: AECOM		Location:

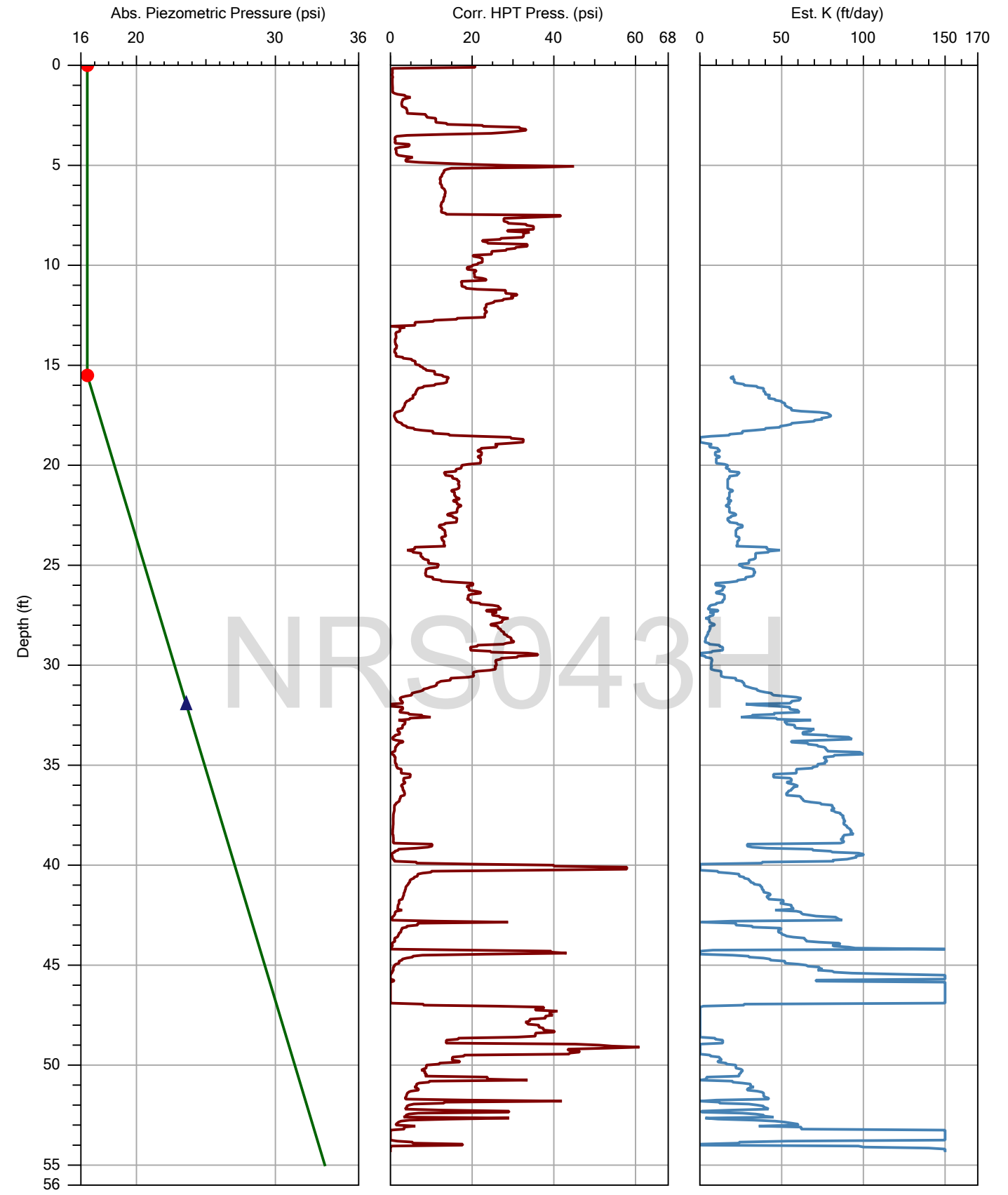


HPT DISSIPATION (SINGLE CASE)

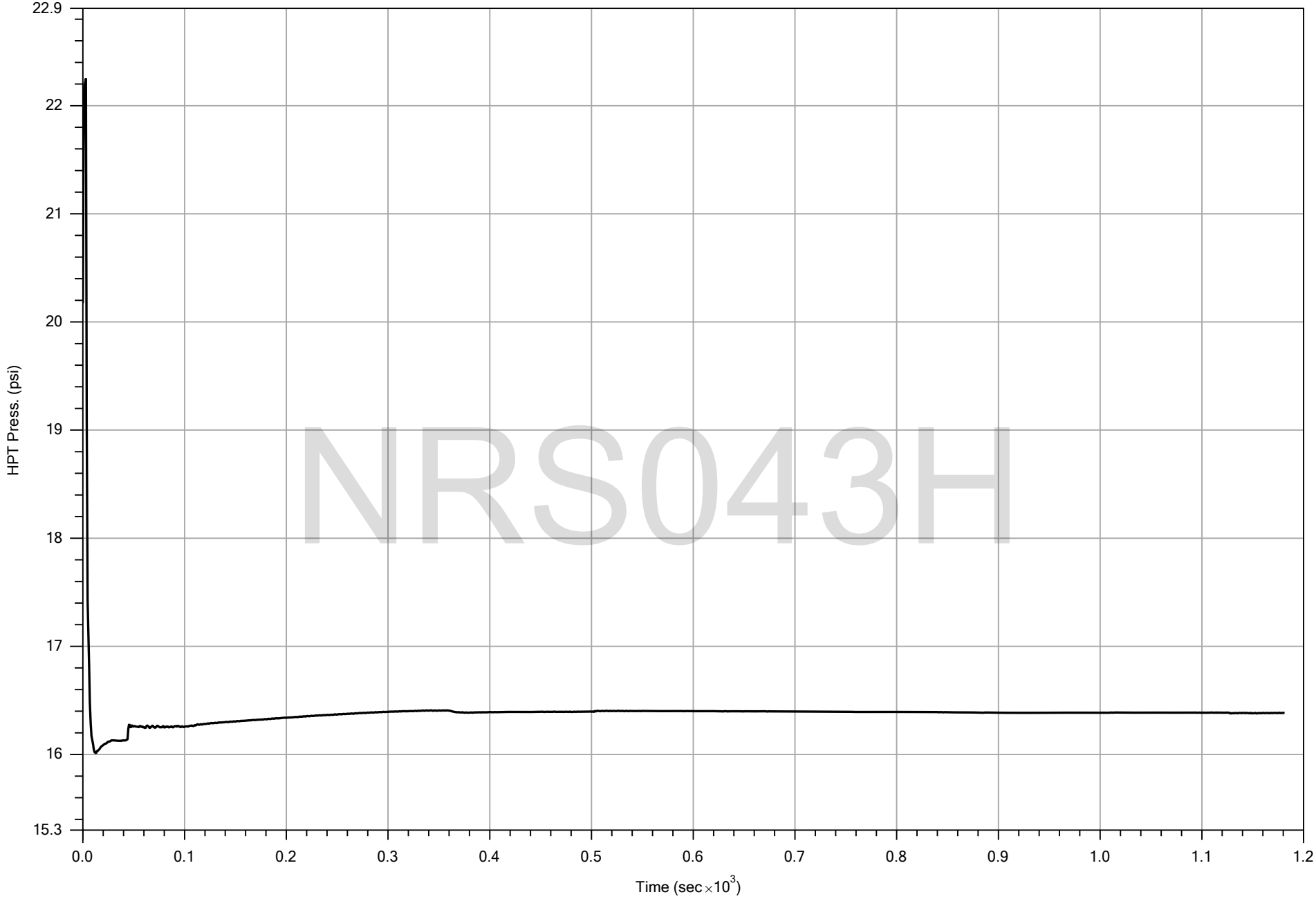
Company: ZTS	Operator: RR	File: NRS042H.DIS	Date: 6/26/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 40.30 ft	Test: 1



			File: NRS043H.DAT
Company: ZTS	Operator: RR		Date: 6/27/2015
Project ID: TVA	Client: AECOM		Location:

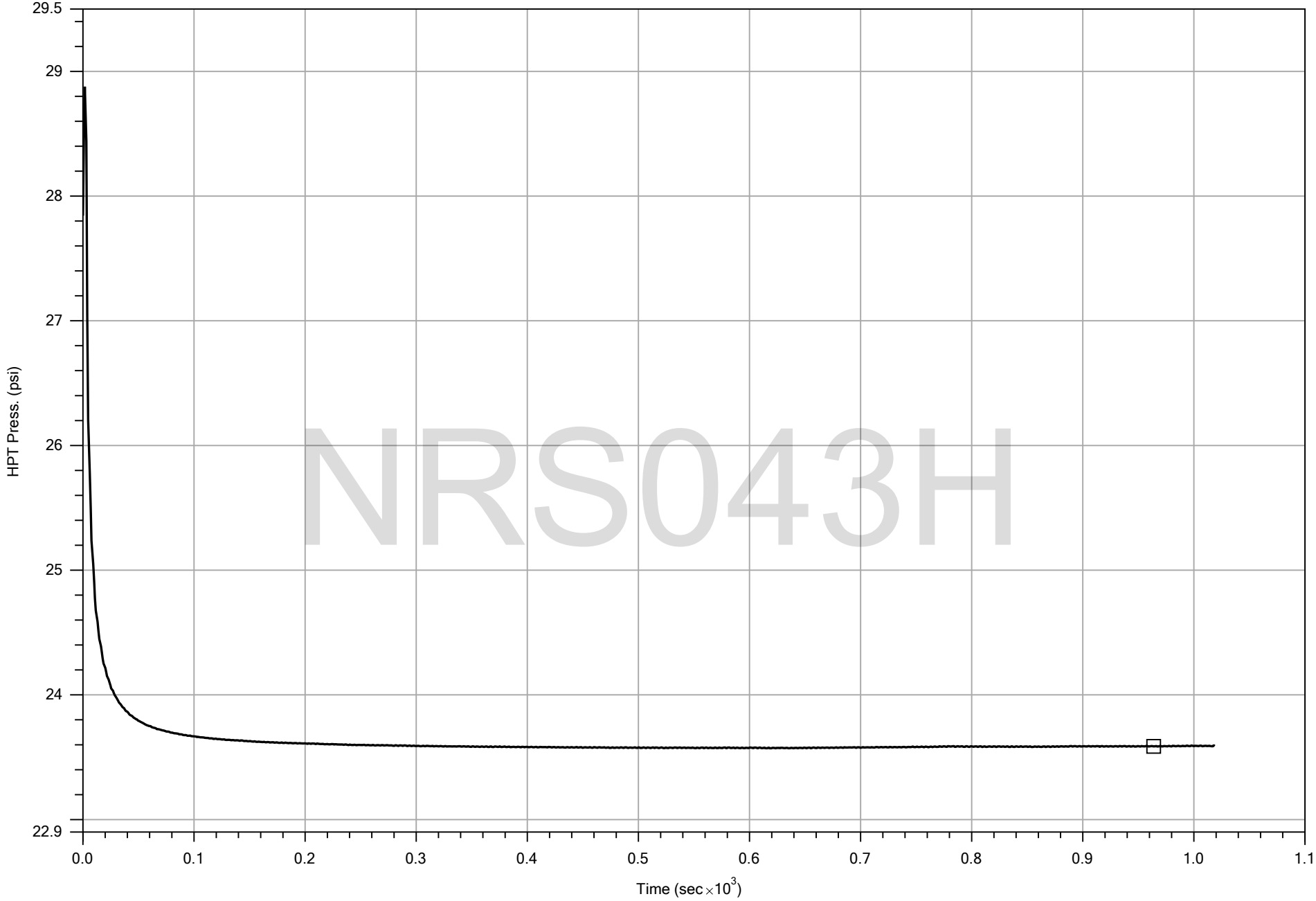


			File: NRS043H.DAT
Company: ZTS	Operator: RR		Date: 6/27/2015
Project ID: TVA	Client: AECOM		Location:



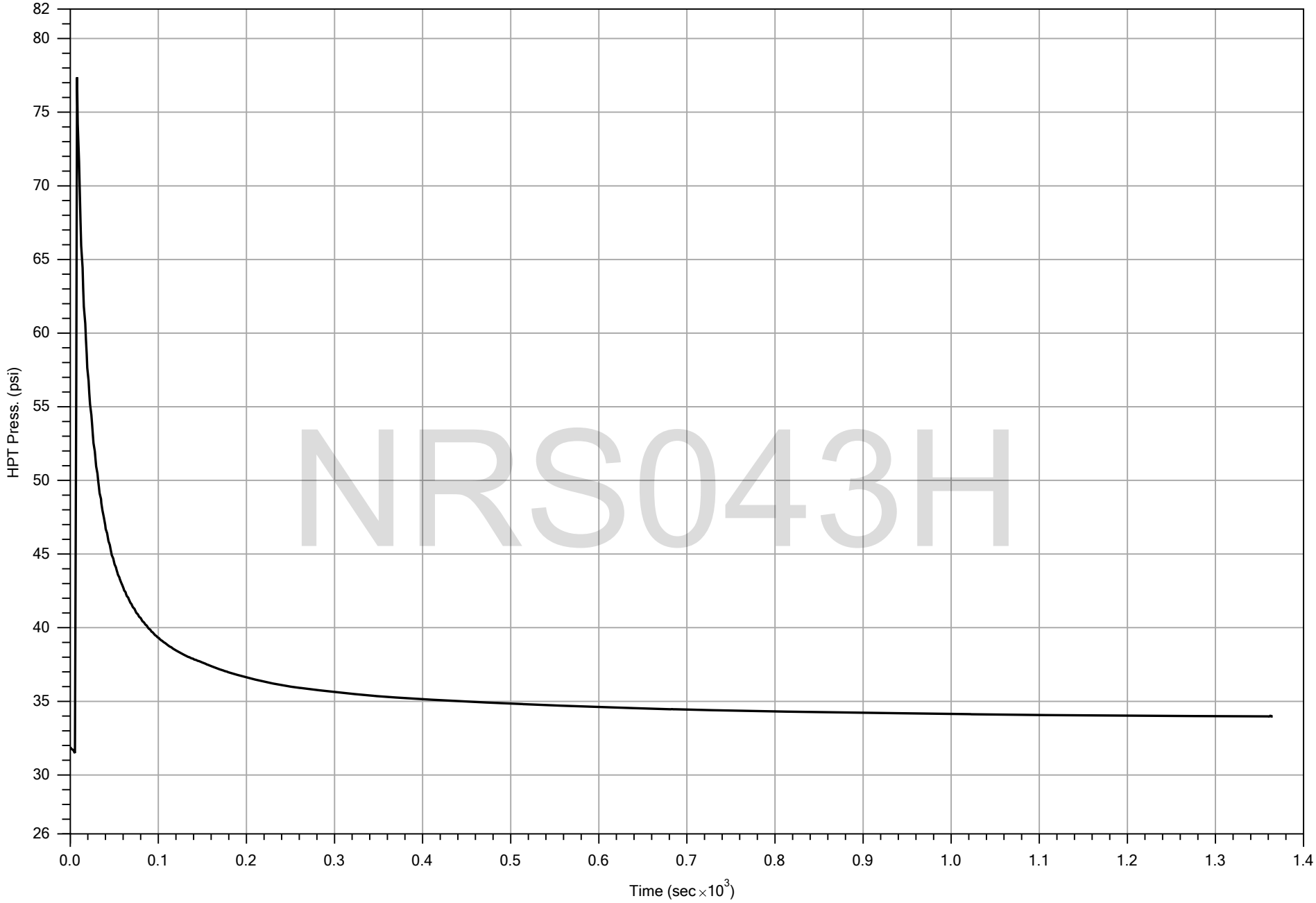
HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 13.05 ft	Test: 1
		File: NRS043H.DIS	Date: 6/27/2015



HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS043H.DIS	Date: 6/27/2015
Project ID: TVA	Client: AECOM	Location:	Sensor: HPT Press.
		Depth: 31.95 ft	Test: 1



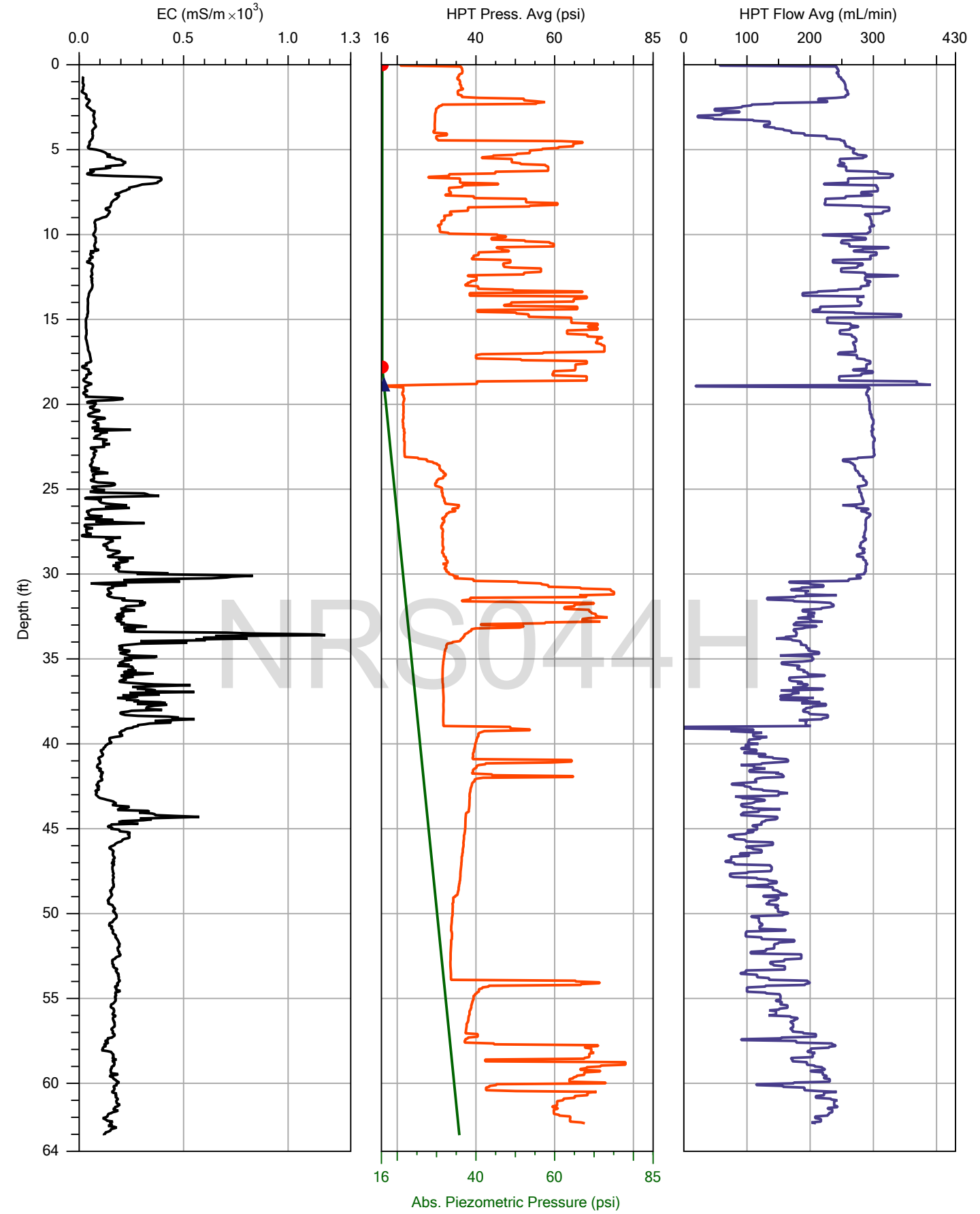
ZEBRA

HPT DISSIPATION (SINGLE CASE)

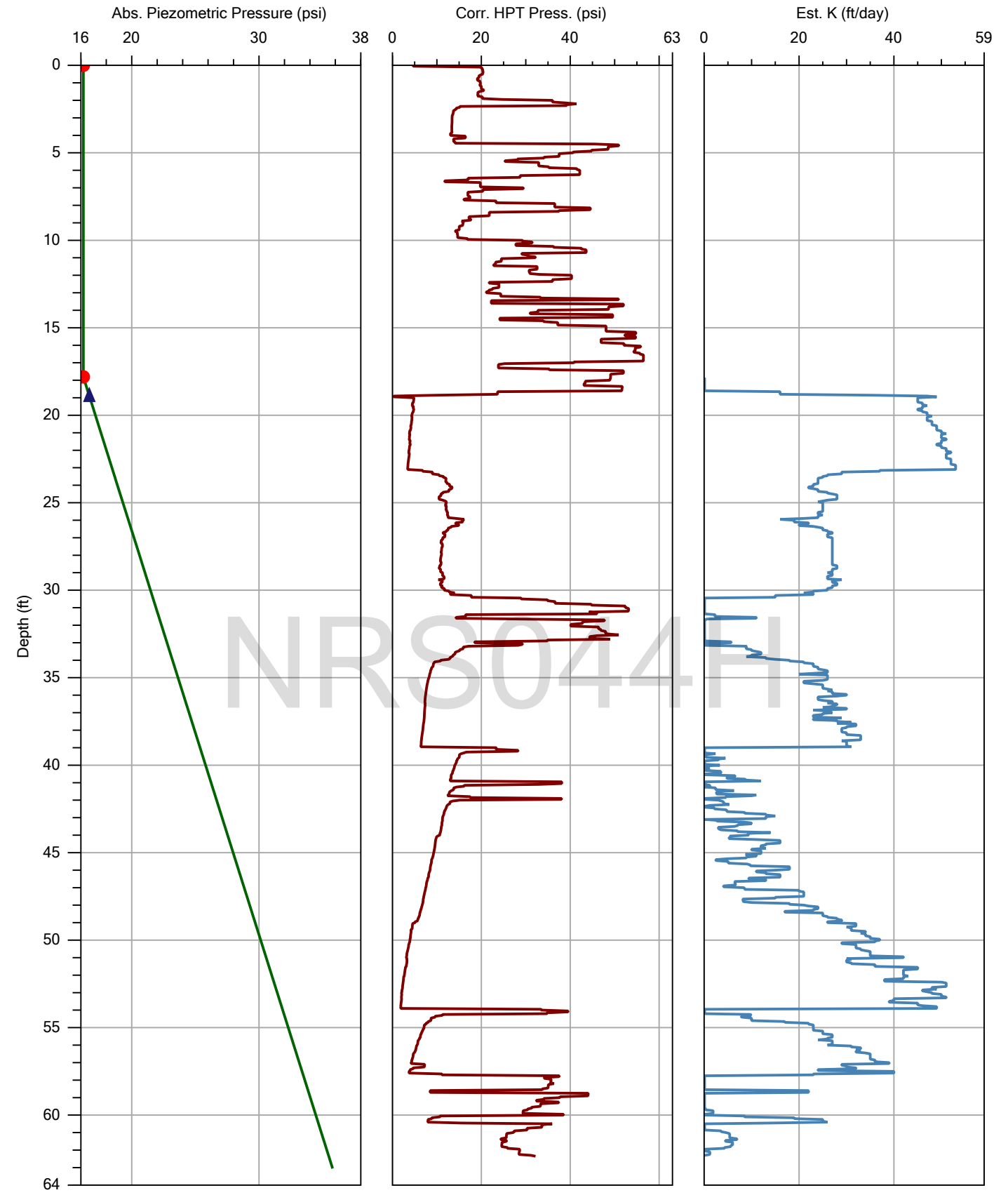
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 54.40 ft	Test: 1

File: NRS043H.DIS

Date: 6/27/2015



			File: NRS044H.DAT
Company: ZTS	Operator: RR		Date: 6/27/2015
Project ID: TVA	Client: AECOM		Location:



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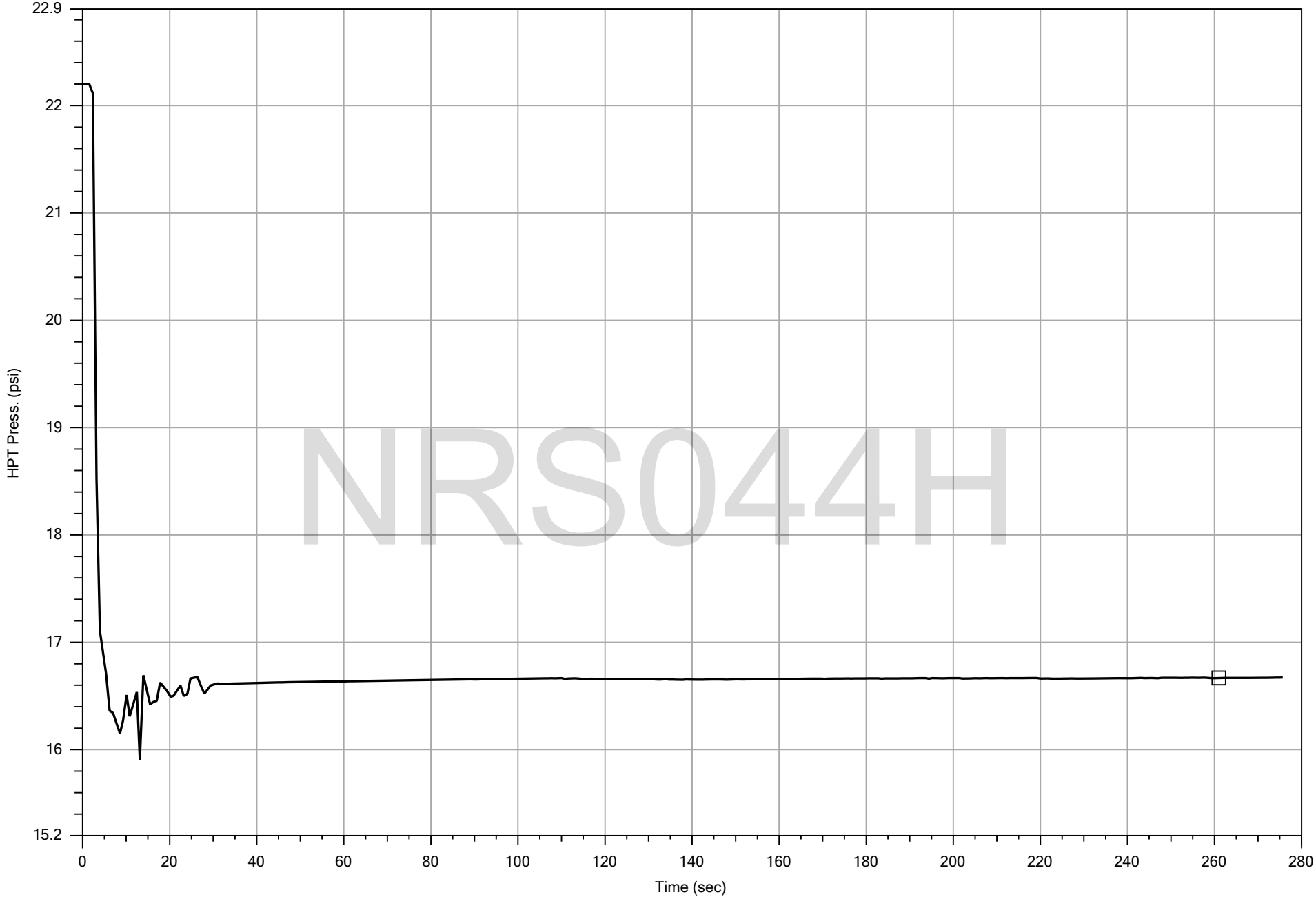
Company: ZTS	Operator: RR		Date: 6/27/2015
Project ID: TVA	Client: AECOM		Location:



HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	File: NRS044H.DIS	Date: 6/27/2015
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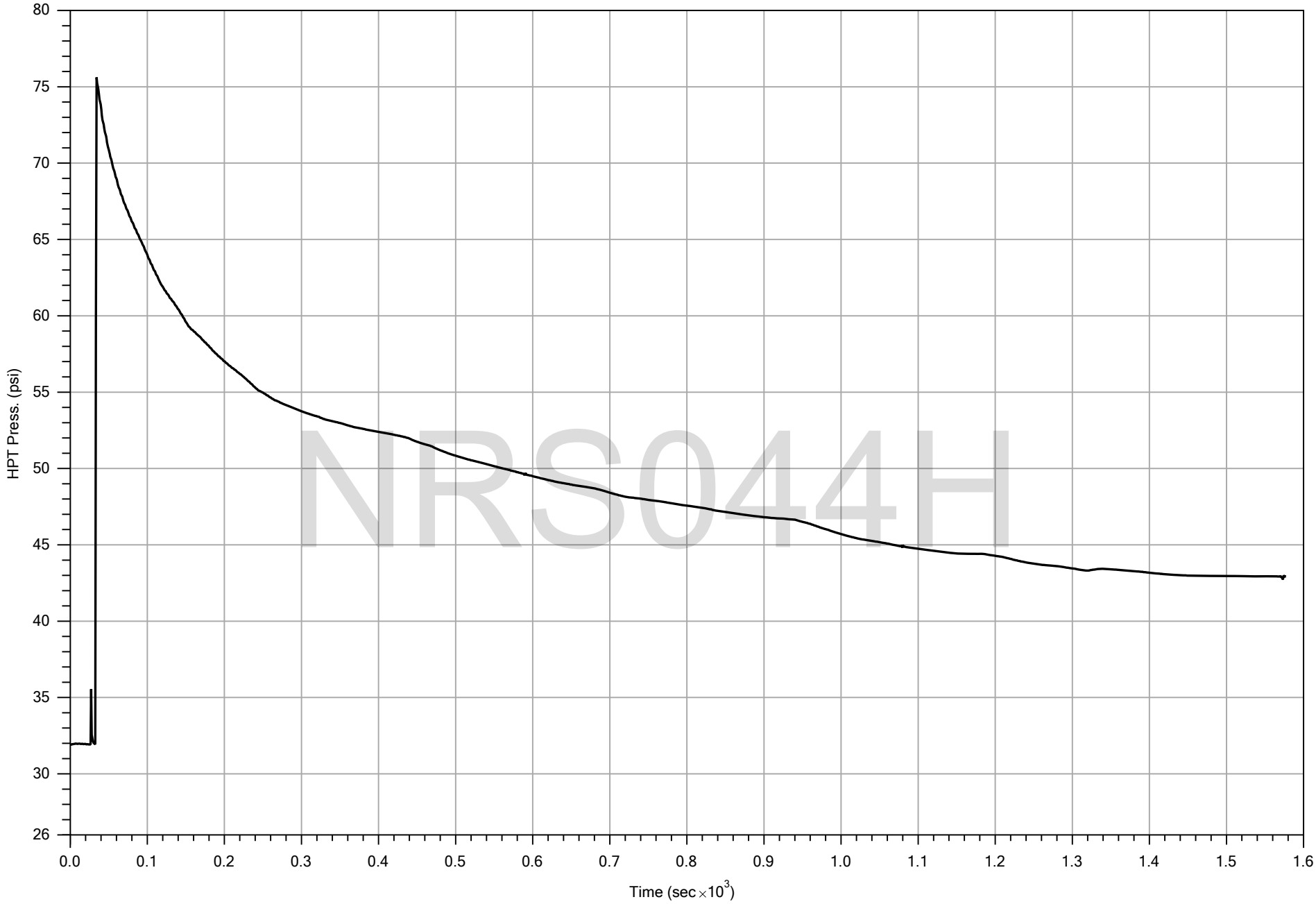
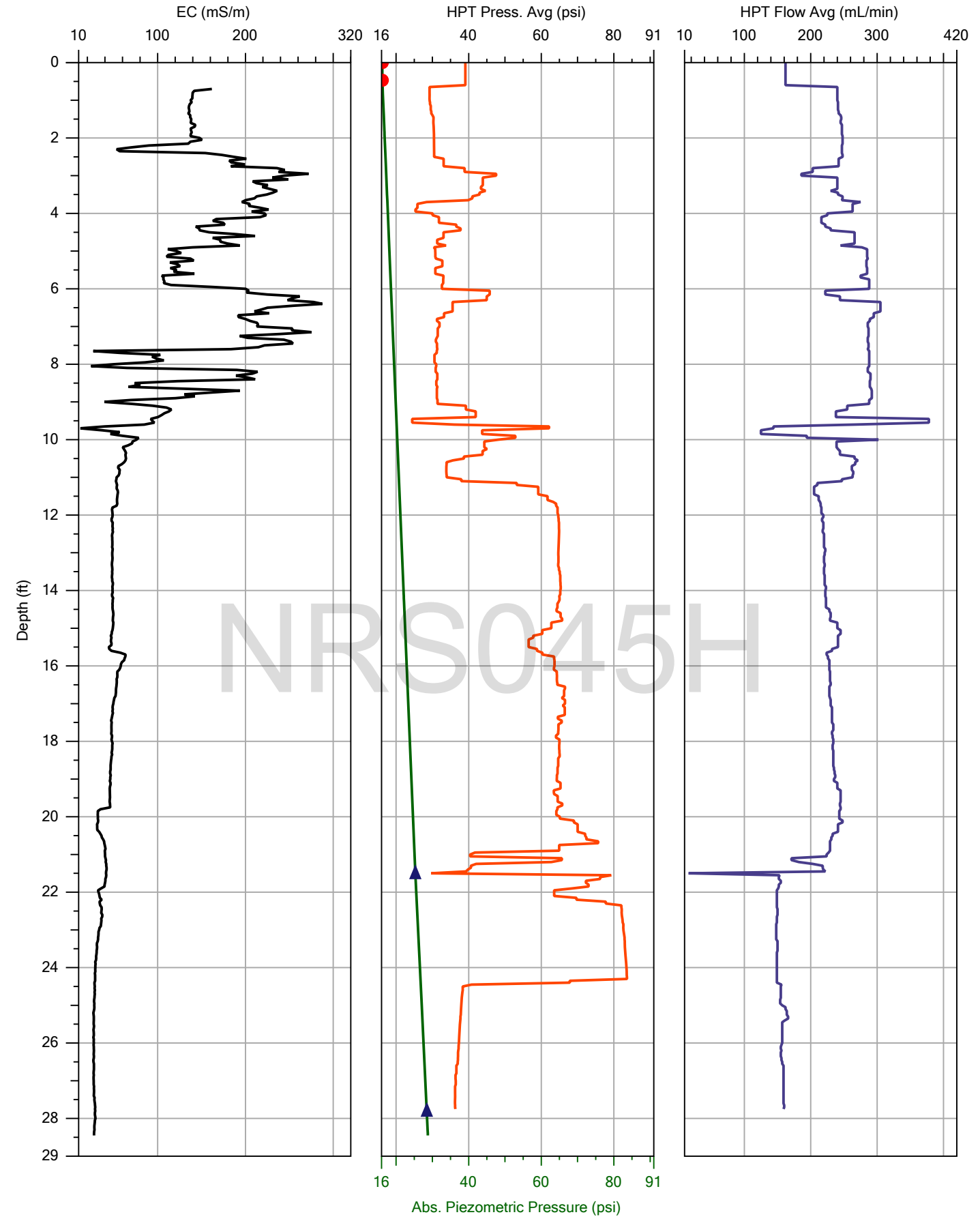
		Depth: 18.90 ft	Test: 1

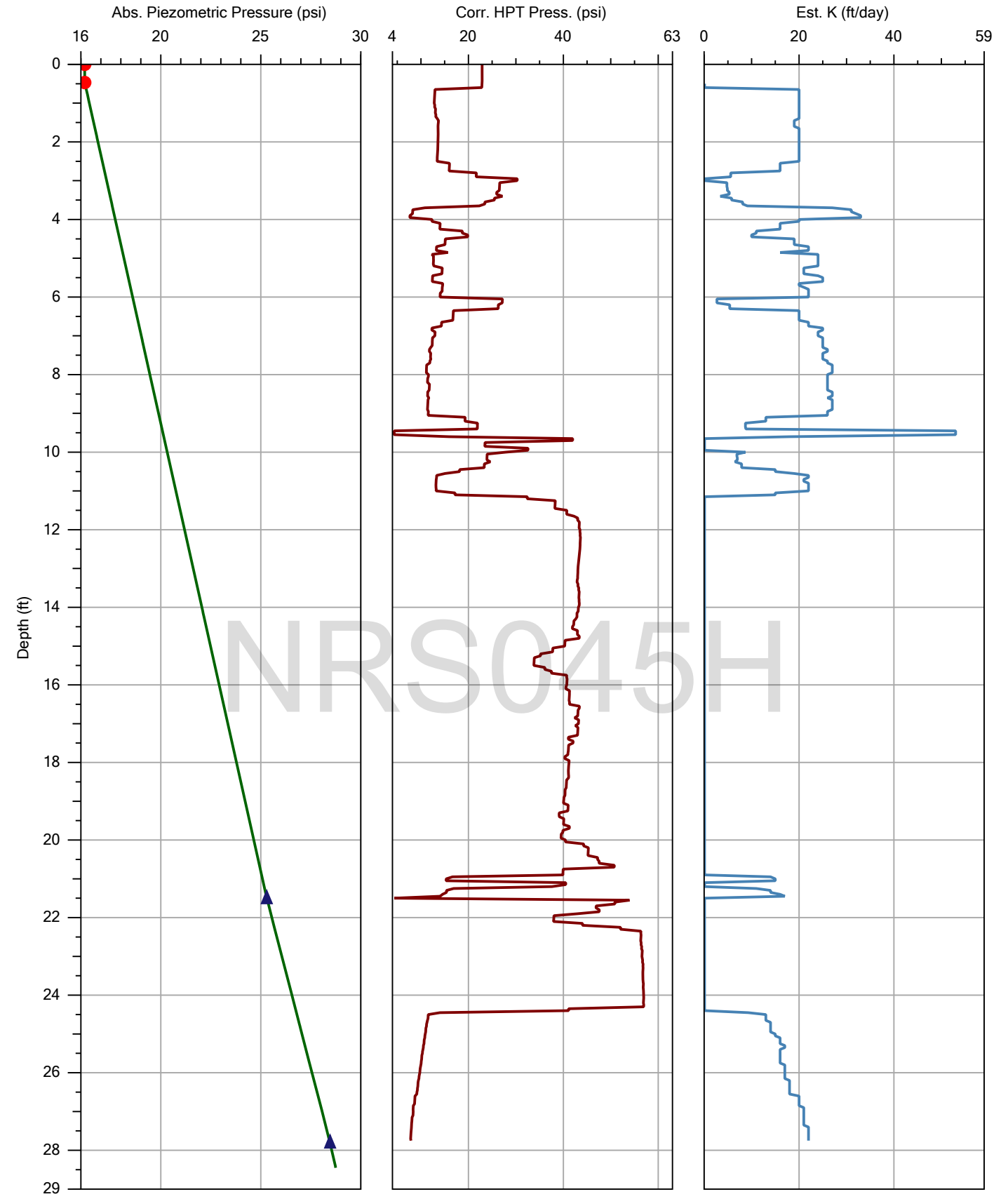


HPT DISSIPATION (SINGLE CASE)

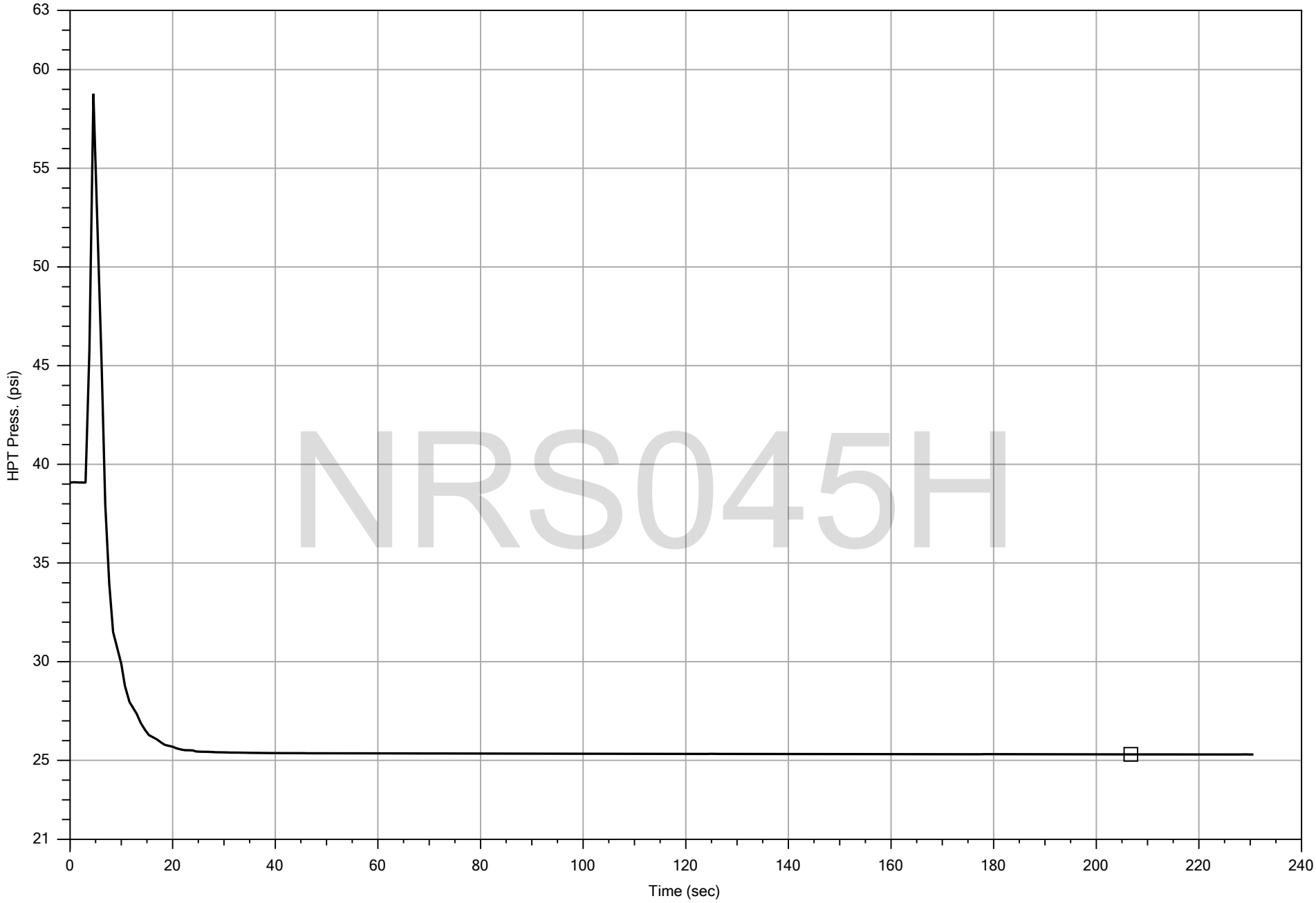
Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 39.00 ft	Test: 1
File: NRS044H.DIS			Date: 6/27/2015



			File: NRS045H.DAT
Company: ZTS	Operator: RR		Date: 6/27/2015
Project ID: TVA	Client: AECOM		Location:

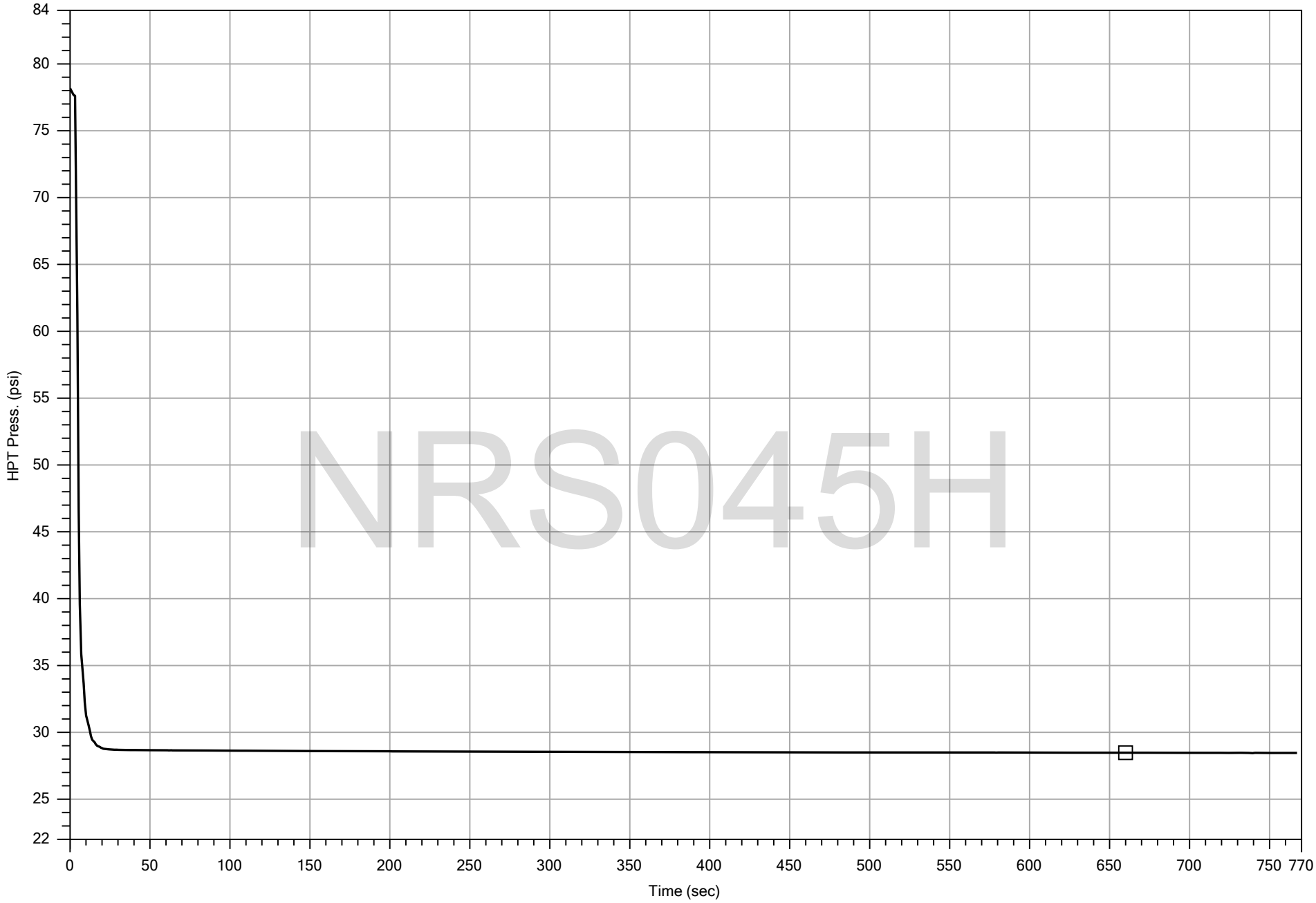


			File: NRS045H.DAT
Company: ZTS	Operator: RR		Date: 6/27/2015
Project ID: TVA	Client: AECOM		Location:



HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 21.50 ft	Test: 1
		File: NRS045H.DIS	Date: 6/27/2015



HPT DISSIPATION (SINGLE CASE)

Company: ZTS	Operator: RR	Location:	Sensor: HPT Press.
Project ID: TVA	Client: AECOM	Depth: 27.80 ft	Test: 1
		File: NRS045H.DIS	Date: 6/27/2015

Appendix B – Boring Logs and Monitoring Well Construction Details

Table of Contents

1. NRS 2020 Field Investigation Boring Logs
2. NRS 2015 Field Investigation Boring Logs
3. NRS Historical Well Boring Logs

NRS 2020 Field Investigation Boring Logs

Project: Gallatin Fossil Plant, NRS Field Investigation
Project Location: Gallatin, TN
Project Number: 60621225

Key to Logs

Elevation, feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resist. Blows/6" OR CORE%RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Pene-trometer, tsf	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Well Details	REMARKS AND OTHER DETAILS
1	2	3	4	5	6	7	8	9	10	11	12

COLUMN DESCRIPTIONS

1 **Elevation:** Elevation in feet referenced to mean sea level (MSL) or site datum.

2 **Depth:** Depth in feet below ground surface.

3 **Type:** Type of soil sample collected at depth interval shown, sampler symbols are explained below.

4 **Number:** Count of the number of intervals collected.

5 **Sampling Resist., Blows/6" OR CORE%RQD:** Column not used.

6 **Recovery:** Percentage of driven sample length actually recovered.

7 **Pocket Penetrometer:** Pocket penetrometer field consistency measurement in tons per square foot (tsf).

8 **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.

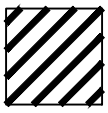
9 **Material Description:** Description of material encountered; may include color, moisture, grain size, and density/consistency.

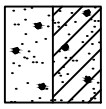
10 **Water Content:** Water content of soil sample measured in laboratory, expressed as percent of dry weight of sample.

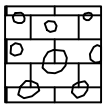
11 **Well Details:** Diagram of well installation.

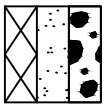
12 **Remarks and Other Details:** Comments and observations regarding drilling or sampling made by driller or field personnel. Also includes well details.

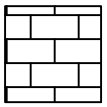
TYPICAL MATERIAL GRAPHIC SYMBOLS

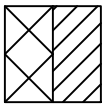

CLAY, high plasticity

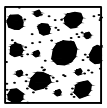

Clayey SAND

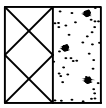

Weathered Limestone

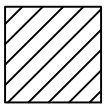

Fill: ASH/ GRAVEL

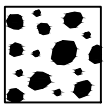

Limestone


Fill: Silty CLAY

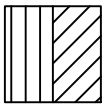

SAND and GRAVEL


Fill: ASH


Silty or Sandy CLAY, low to moderate plasticity


GRAVEL

Silty SAND

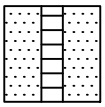

CLAYEY SILT

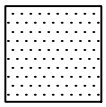
OTHER GRAPHIC SYMBOLS

Depth water observed during drilling

Inferred or gradational lithologic contact

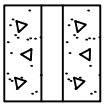
TYPICAL WELL GRAPHIC SYMBOLS

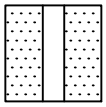

Slotted Screen


Fill Sand

Bentonite Backfill

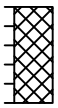
Bentonite Seal

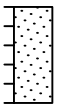

Portland Grout


Sand Pack

TYPICAL SAMPLER GRAPHIC SYMBOLS

Hand Auger


Sonic


Direct Push Technology (DPT)

MINOR SOIL TYPE(s)

"trace" When the soil type's percentage is estimated, using visual/manual procedures, to be between 1 and 15 percent of the total sample.

"with" When the soil type's percentage is estimated, using visual/manual procedures, to be greater than 15 percent and less than 30 percent of the total sample.

Descriptions and stratum lines are interpretive; field descriptions may have been modified to reflect lab test results. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced; they are not warranted to be representative of subsurface conditions at other locations or times.

Last saved by: ROBINSONK1 (2021-01-18) LastPlotted: 2021-01-18
Filename: C:\USERS\ROBINSONK1\DOCUMENTS_PROJECTS\BORING_LOG\BORING_LOG_LITHOLOGY.DWG

AECOM

Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring
NRS051
Sheet 1 of 1

Date(s) Drilled	**1/29/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**39.0 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**484.2 ft above msl**
Borehole Backfill	**Bentonite Chips on 1/29/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 699,703.5 E 1,880,360.8**	Groundwater Level(s)	**32.0 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
484.2	0.0										
483.2	1.0							FILL: Brownish orange silty CLAY, Low to moderate plasticity, Stiff, Damp			**Bentonite Backfill (0'-39' bgs)**
481.5	2.7							FILL: Dark gray ASH/GRAVEL, Coarse grained, Very stiff, Damp			
479.2	5.0										
480	5	DPT	1		73			Orange silty CLAY, Trace fine grained silt, High plasticity, Soft, Moist			
475	10	DPT	2		42						
		DPT	3		52			@ 10'-15' bgs Soft to dense, Damp			
470	15	DPT	4		62			@ 17' bgs Grayish orange			
465	20	DPT	5		65						
460	25	DPT	6		50			@ 25' bgs Trace limestone fragments			
455	30	DPT	7		63			@ 30' bgs Brownish gray, Soft to firm			
451.4	32.8							@ 32'-32.3' bgs Light gray, Soft, Wet			
450	35	DPT	8		65			Fractured LIMESTONE, Weathered			
447.2	37.0							@ 35'-37' bgs Fractured light gray LIMESTONE, Small angular pieces, Dry			
445.2	39.0							@ 37'-39' bgs Medium brown and gray silty CLAY, High plasticity, Soft, Trace limestone fragments, Damp			
445	40							End of Boring at 39´ bgs			
440	45										
435	50										
430	55										
425	60										

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AECOM

Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS052

Sheet 1 of 2

Date(s) Drilled	**1/30/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**65.0 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**483.9 ft above msl**
Borehole Backfill	**Bentonite Chips on 1/30/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 699,669.5 E 1,880,331.8**	Groundwater Level(s)	**35.0 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
480	0		DPT 1		75			483.9 / 0.0 482.7 FILL: Brownish orange silty CLAY, Low to moderate plasticity, Stiff, Damp 1.2 480.7 FILL: Dark gray ASH/GRAVEL, No plasticity, Coarse grained, Very stiff, Damp 3.2 478.9 5.0			**Bentonite Backfill (0'-65' bgs)**
475	5		DPT 2		38			Orange silty CLAY, Trace fine grained silt, High plasticity, Soft, Moist			
470	10		DPT 3		53			@ 10' bgs Soft to dense @ 11.6' bgs Grayish orange, Damp to moist			
465	15		DPT 4		42			@ 15' bgs Orangish brown, Trace of organic matter, Firm, Damp			
460	20		DPT 5		73			@ 20' bgs Medium brown and gray, High plasticity, Trace of gravel, Firm, Damp			
455	25		DPT 6		55			@ 25' bgs Brownish orange, Firm, Damp @ 26.6'-26.9' bgs Limestone fragments @ 27' - 27.4' bgs Trace of organic matter			
450	30		DPT 7		45			@ 30' bgs Soft to firm @ 30.8'-30.9' bgs Small angular pieces of limestone and chert @ 31'-35' bgs Medium to dark brown, Soft to firm, Moist @ 32' bgs Small angular pieces of limestone and chert ▽			
445	35		DPT 8		98			@ 35' Light brown to orangish brown, Stiff, Damp @ 35'-35.5' bgs Limestone fragments, Wet @ 35'-38' bgs Medium brown, Trace sand			
440	40		DPT 9		100			443.9 / 40.0 Brownish orange silty CLAY, Moderate to high plasticity, Very stiff, Dry			
435	45		DPT 10		100			@ 45' bgs Orangish tan, Very stiff, Damp to moist			
430	50		DPT 11		100			431.9 / 52.0 @ 52'-55' bgs SAND and GRAVEL			
425	55		DPT 12		67			428.9 / 55.0 @ 55' bgs Orangish brown, Trace of small angular pieces of limestone and chert, Soft, Moderate to high plasticity, Wet			
	60										

Report: GEO_CR_WELL; File C:\USERS\NADINE.DEMERS\DESKTOP\NRS\GAF NRS BORING LOGS- 2020.GPJ; 7/14/2020 2:37:39 PM

AECOM

Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring
NRS052
Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES: Type / Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
420	60	DPT 13		100		418.9				Bentonite Backfill (0'-65' bgs)
	65						End of Boring at 65´ bgs	65.0		
415	70									
410	75									
405	80									
400	85									
395	90									
390	95									
385	100									
380	105									
375	110									
370	115									
365	120									
360	125									
355	130									

Report: GEO_CR_WELL; File C:\USERS\NADINE.DEMERS\DESKTOP\NRS\GAF NRS BORING LOGS- 2020.GPJ; 7/14/2020 2:37:39 PM

Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS053

Sheet 1 of 2

Date(s) Drilled	**1/29/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**72.0 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**483.6 ft above msl**
Borehole Backfill	**Bentonite Chips on 1/29/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 699,627.8 E 1,880,319.2**	Groundwater Level(s)	**61.1 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
480	0		DPT 1		83			483.6 0.0 FILL: Brownish orange silty CLAY, Low to moderate plasticity, Stiff, Damp 481.1 2.5 480.0 FILL: Dark gray ASH/GRAVEL, Coarse grained, No plasticity, very stiff, Damp 3.6 478.6 5.0			**Bentonite Backfill (0'-72' bgs)**
475	5		DPT 2		60			Orange silty CLAY, Trace of fine grained silt, High plasticity, Soft, Moist			
470	10		DPT 3		53			@ 11.8' bgs Grayish orange, Soft to dense, Damp to moist			
465	15		DPT 4		51			@ 15' bgs Orangish brown, Trace of gravel, Firm, Damp			
460	20		DPT 5		48			@ 20' bgs Medium brown and gray, Trace of gravel, High plasticity, Firm, Damp			
455	25		DPT 6		72			@ 25' bgs Brownish orange, Firm, Damp			
450	30		DPT 7		62			@ 30' bgs Firm to stiff @ 30.3'-33.4' bgs Small angular pieces of limestone and chert @ 33.5'-35' bgs Medium to dark brown silty CLAY, Soft to firm, Moist			
445	35		DPT 8		100			@ 35' bgs Light brown to orangish brown, Stiff, Damp			
440	40		DPT 9		100						
435	45		DPT 10		100			@ 45' bgs Orangish tan, Very stiff, Dry			
430	50		DPT 11		100			@ 49' bgs Small piece of chert @ 50' bgs Orangish brown, Trace black mottling, Trace small angular pieces of limestone and chert, Firm, Moderate to high plasticity, Damp			
425	55		DPT 12		100			@ 55' bgs Increase in limestone and chert, Damp to moist			
	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS053

Elevation, feet	Depth, feet	SAMPLES: Type / Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
420	60	DPT 13		80			@ 60' bgs Stiff @ 61.1'-63' bgs Trace sand and quartz, Firm, Wet			Bentonite Backfill (0'-72' bgs)
415	65	DPT 14		47			@ 65' bgs Brownish orange, High plasticity, Soft, Moist			
410	70	DPT 15		100			411.6 @ 72' bgs Refusal 72.0 End of Boring at 72´ bgs			
405	75									
400	80									
395	85									
390	90									
385	95									
380	100									
375	105									
370	110									
365	115									
360	120									
355	125									
	130									

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AECOM

Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS054

Sheet 1 of 2

Date(s) Drilled	1/28/20	Logged By	E. House	Checked By	N. Demers
Drilling Method	Direct Push	Drill Bit Size/Type	Macro Core Sampler	Total Depth of Borehole	66.0 feet
Drill Rig Type	Geoprobe 8420	Drilling Contractor	Cascade	Surface Elevation	483.0 ft above msl
Borehole Backfill	Bentonite Chips on 1/28/20	Sampling Method(s)	1-inch liner core	Hammer Data	N/A
Coordinate Location	N 699,638.6 E 1,880,300.4	Groundwater Level(s)	65 ft bgs (30 ft bgs - Perched Zone)		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
	0							483.0 / 0.0			
480			DPT 1		65			482.0 FILL: Brownish orange silty CLAY, Low to moderate plasticity, Stiff, Damp / 1.0			Bentonite Backfill (0'-66' bgs)
	5							FILL: Dark gray ASH/GRAVEL, Coarse grained, No plasticity, Very stiff, Damp / 478.0 / 5.0			
475			DPT 2		53			477.0 RESIDUUM: Orange brown, Medium grained, Loose, No plasticity, Dry / 6.0			
	10							Orange silty CLAY, Trace fine grained silt, High plasticity, Soft, Moist			
470			DPT 3		53						
	15							@ 14' bgs Grayish orange, Soft to dense, Soft, Damp to moist			
465			DPT 4		35			@ 15' bgs Damp			
	20							463.0 / 20.0			
460			DPT 5		38			Medium brown silty CLAY, Trace of black mottling, Moderate to high plasticity, Firm, Moist			
	25							@ 25' bgs Medium to dark brown, Soft to firm, Damp			
455			DPT 6		60						
	30							@ 30' bgs Medium brown, Wet			
450			DPT 7		62						
	35							@ 35' bgs Brownish orange, Firm, Damp			
445			DPT 8		100						
	40		DPT 9		100						
440			DPT 10		100			@ 42.5' bgs Orangish tan, Firm, Dry			
	45		DPT 11		100						
435			DPT 12		100			@ 47.5' bgs Lean, Stiff, Dry			
	50		DPT 13		100						
430			DPT 14		100			@ 52.5' bgs Trace of black mottling			
	55		DPT 15		100			@ 55' bgs Increase in mottling, Trace small angular limestone, Damp			
425			DPT 16		100			@ 57.5'-58.5' bgs Trace of sand, Fine to medium grained, Moist			
	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS054

Elevation, feet	Depth, feet	SAMPLES: Type / Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
420	60	DPT 17		47			@ 60' bgs No sand, Firm, Damp			Bentonite Backfill (0'-66' bgs)
	65	DPT 18		158			417.0 Medium brown silty CLAY, Fine and medium grained sand, Soft, Wet ▽ 66.0			
415							End of Boring at 66´ bgs			
	70									
410										
	75									
405										
	80									
400										
	85									
395										
	90									
390										
	95									
385										
	100									
380										
	105									
375										
	110									
370										
	115									
365										
	120									
360										
	125									
355										
	130									

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS055

Sheet 1 of 2

Date(s) Drilled	**1/28/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**70.0 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**482.5 ft above msl**
Borehole Backfill	**Bentonite Chips on 1/28/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 699,604.2 E 1,880,272.1**	Groundwater Level(s)	**59.5 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
482.5	0.0										**Bentonite Backfill (0'-70' bgs)**
481.5	1.0							FILL: Brownish orange silty CLAY, Low to moderate plasticity, Stiff, Damp			
479.5	3.0							FILL: Dark gray ASH/GRAVEL, Coarse grained, No plasticity, Very stiff, Damp			
477.5	5.0							RESIDUUM: Orangish brown, Medium grained, No plasticity, Loose, Dry			
476.0	6.5							Orange silty CLAY, Trace fine grained silt, High plasticity, Soft, Moist			
480			DPT 1		67						
475	5		DPT 2		88						
470	10		DPT 3		55			@ 12.5' bgs Grayish orange, Soft to dense, Damp to moist			
465	15		DPT 4		51			@ 15' bgs Trace of gravel, Damp			
462.5	20.0							Medium brown silty CLAY, Trace of black mottling, Moderate to high plasticity, Firm, Damp			
460	20		DPT 5		65						
455	25		DPT 6		67			@ 25' bgs Medium to dark brown, Soft to firm, Damp			
450	30		DPT 7		62			@ 30' bgs Brownish orange, Damp			
445	35		DPT 8		100			@ 35' bgs Light brown, Soft to firm, Damp			
440	40		DPT 9		100						
435	45		DPT 10		100			@ 45' bgs Orangish tan, Firm			
432.5	50.0							Brownish orange silty CLAY, Black mottling, High plasticity, Firm, Damp			
430	50		DPT 11		73						
425	55		DPT 12		60			@ 58' bgs Orangish brown, Trace small angular pieces of limestone and quartz, Moderate to high plasticity, Firm.			
	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS055

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES: Type / Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
420	60	DPT 13		75			Moist @ 59.5' bgs Wet			**Bentonite Backfill (0'-70' bgs)**
415	65	DPT 14		80			@ 65' bgs Trace fine grained sand, Saturated			
412.5	70						End of Boring at 70´ bgs			
410	75									
405	80									
400	85									
395	90									
390	95									
385	100									
380	105									
375	110									
370	115									
365	120									
360	125									
355	130									

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS056

Sheet 1 of 2

Date(s) Drilled	**1/27/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**69.0 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**482.1 ft above msl**
Borehole Backfill	**Bentonite Chips on 1/27/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 699,564.9 E 1,880,238.5**	Groundwater Level(s)	**62.5 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
480	0		DPT 1		65			482.1 0.0 481.1 FILL: Brownish orange silty CLAY, Low to moderate plasticity, Stiff, Damp 1.0 479.1 FILL: Dark gray ASH/GRAVEL, No plasticity, Very stiff, Damp 3.0 477.1 5.0			**Bentonite Backfill (0'-69' bgs)**
475	5		DPT 2		50			476.1 RESIDUUM: Orangish brown, Medium grained, No plasticity, Loose, Dry 6.0 Orange silty CLAY, Trace fine grained silt, High plasticity, Soft, Moist			
470	10		DPT 3		48						
465	15		DPT 4		63			@ 14.6' bgs Grayish orange, Soft to dense, Damp to moist @ 15' bgs Trace organic matter and black mottling, Damp			
460	20		DPT 5		52			462.1 20.0 Medium brown silty CLAY, Moderate to high plasticity, Firm, Damp			
455	25		DPT 6		100			@ 25' bgs Brownish orange			
450	30		DPT 7		100						
445	35		DPT 8		58			@ 36' bgs Light brown, Trace black mottling, Soft to firm, Damp			
440	40		DPT 9		92						
435	45		DPT 10		100						
430	50		DPT 11		100			429.1 53.0 Brownish orange silty CLAY, Black mottling, Trace gravel, High plasticity, Firm, Dry			
425	55		DPT 12		100			425.1 57.0 Orangish brown silty CLAY, Trace small angular pieces of limestone and quartz, Moderate to high plasticity, Firm, Wet			
	60		DPT 13		100						

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS056

Elevation, feet	Depth, feet	SAMPLES: Type Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
420	60	DPT 14		100			419.6 62.5			Bentonite Backfill (0'-69' bgs)
		DPT 15		100			Orangish brown, silty CLAY with fine grained sands, Low plasticity, Soft, Wet			
415	65	DPT 16		100			416.1 66.0 Tannish brown silty SAND, Medium grained, No plasticity,			
		DPT 17		100			414.1 Slightly loose, Wet 68.0			
410	70						413.3 68.8 Orangish brown silty CLAY, High plasticity, Soft, Wet 413.1 69.0			
							LIMESTONE			
405	75						End of Boring at 69´ bgs			
400	80									
395	85									
390	90									
385	95									
380	100									
375	105									
370	110									
365	115									
360	120									
355	125									
	130									

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS057

Sheet 1 of 2

Date(s) Drilled	**2/3/20 to 2/4/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**70.0 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**500.9 ft above msl**
Borehole Backfill	**Bentonite Chips on 2/4/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 700,252.1 E 1,880,771.9**	Groundwater Level(s)	**15.0 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
500	0							500.9 0.0 500.1 CONCRETE 0.8			**Bentonite Backfill (0'-70' bgs)**
			DPT 1		57			FILL: GRAVEL, Vaious sizes 496.9 4.0			
495	5							495.9 FILL: Medium brown silty CLAY, Low to moderate plasticity, Stiff, Dry 5.0			
			DPT 2		67			FILL: Dark gray and dark brown ASH, Medium to coarse grained, No plasticity, Friable, Dry 490.9 10.0			
490	10		DPT 3		10			FILL: Dark black ASH/GRAVEL, Coarse grained, No plasticity, Very stiff, Dry			
485	15		DPT 4		100			@ 15'-17.6' bgs Dark gray to black, Coarse and fine grained, Saturated then wet	▽		
480	20		DPT 5		88			479.9 @ 20'-21' bgs Saturated 21.0 Brownish orange CLAY, High plasticity, Firm, Slightly damp			
475	25		DPT 6		100						
470	30		DPT 7		100			@ 30' bgs Trace silt			
465	35		DPT 8		100			@ 35' bgs Trace small angular limestone fragments			
460	40		DPT 9		100			@ 40' bgs Trace silt and black mottling, Damp			
455	45		DPT 10		100			455.9 45.0 Tan and brownish orange silty CLAY, Trace black mottling, Moderate plasticity, Stiff, Dry			
450	50		DPT 11		100						
445	55		DPT 12		82			445.9 55.0 Orangish brown sandy CLAY, Trace limestone fragments, Fine grained sands, Low to moderate plastcity, Damp			
	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS057

Elevation, feet	Depth, feet	SAMPLES: Type / Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
440	60	DPT 13		67			@ 60' bgs Moist			Bentonite Backfill (0'-70' bgs)
435	65	DPT 14		37						
430	70						430.9 @ 69.5' bgs Light brown, Medium grained sands, Wet 70.0			
							End of Boring at 70´ bgs			
425	75									
420	80									
415	85									
410	90									
405	95									
400	100									
395	105									
390	110									
385	115									
380	120									
375	125									
	130									

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS058

Sheet 1 of 2

Date(s) Drilled	**2/3/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**63.5 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**500.5 ft above msl**
Borehole Backfill	**Bentonite Chips on 2/3/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 700,345.2 E 1,880,537.8**	Groundwater Level(s)	**18.5 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
500	0							500.5 0.0 FILL: Medium brown silty CLAY, Low to moderate plasticity, Stiff, Damp			**Bentonite Backfill (0'-63.5' bgs)**
			DPT 1		77			497.5 3.0 FILL: Dark gray ASH/GRAVEL, Coarse grained, Very stiff, Damp			
495	5		DPT 2		93			495.5 5.0 FILL: Dark gray ASH, Medium to coarse grained, No plasticity, Wet			
490	10		DPT 3		80						
485	15		DPT 4		100			▽ @ 18.5' bgs Saturated			
480	20		DPT 5		100			@ 20' bgs Saturated			
475	25		DPT 6		100			@ 25' bgs Dark gray, Fine grained 472.5 28.0 Orangish brown silty CLAY, High plasticity, Firm, Damp			
470	30		DPT 7		100						
465	35		DPT 8		97			@ 35' bgs Firm to stiff			
460	40		DPT 9		100						
455	45		DPT 10		100			@ 45' bgs Trace black mottling and small pieces of limestone			
450	50		DPT 11		55			450.5 50.0 Brownish orange sandy CLAY, Low plasticity, Firm, Moist			
445	55		DPT 12		45			@ 55' bgs Trace quartz, Wet to saturated			
	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring
NRS058
Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES: Type Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
440	60	DPT 13		100			437.0 63.5			Bentonite Backfill (0'-63.5' bgs)
435	65						End of Boring at 63.5´ bgs			
430	70									
425	75									
420	80									
415	85									
410	90									
405	95									
400	100									
395	105									
390	110									
385	115									
380	120									
375	125									
	130									

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS059

Sheet 1 of 1

Date(s) Drilled	**2/4/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**45.5 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**505.2 ft above msl**
Borehole Backfill	**Bentonite Chips on 2/4/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 700,665.6 E 1,880,672.7**	Groundwater Level(s)	**38.0 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
505	0							505.2 / 0.0 504.2 GRAVEL 1.0 Medium brown silty CLAY, Low to moderate plasticity, Stiff, Dry			**Bentonite Backfill (0'-45.5' bgs)**
		DPT	1		57						
500	5							499.2 / 6.0 Brownish gray CLAY, Moderate to high plasticity, Stiff, Dry			
		DPT	2		57						
495	10							@ 9.8'-10' bgs Chert lens			
		DPT	3		100			@ 12' bgs Brownish orange LIMESTONE lens, Dry @ 13.4' bgs Brownish orange LIMESTONE lens, Dry			
490	15										
		DPT	4		100						
485	20										
		DPT	5		100			@ 22' bgs LIMESTONE lens, Very stiff @ 23.4' bgs LIMESTONE fragments, Dry			
480	25										
		DPT	6		100			477.2 / 28.0 Brownish orange silty CLAY, Low to moderate plasticity, Stiff, Damp			
475	30										
		DPT	7		100			@ 32' bgs Trace fine grained sand, Stiff			
470	35										
		DPT	8		100			@ 36.8'-38' bgs Trace small angular limestone fragment zones ▽ @ 38' bgs Firm to stiff, Wet			
465	40										
		DPT	9		82			@ 43' bgs Soft and saturated			
460	45	DPT	10		100			459.7 / 45.5 End of Boring at 45.5´ bgs			
455	50										
450	55										
	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS060

Sheet 1 of 2

Date(s) Drilled	**1/31/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**75.0 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**500.9 ft above msl**
Borehole Backfill	**Bentonite Chips on 1/31/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 700,468.9 E 1,880,444.7**	Groundwater Level(s)	**15 ft, 35 ft, and 65 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
500	0							500.9 0.0 499.9 FILL: Medium brown silty CLAY, Low to moderate plasticity, Stiff, Damp 1.0 FILL: Dark gray ASH/GRAVEL, Coarse grained, No plasticity, Very stiff, Damp 495.9 5.0			**Bentonite Backfill (0'-75' bgs)**
			DPT 1		83						
495	5		DPT 2		87			FILL: Dark gray ASH, Medium to coarse grained, No plasticity, Wet			
490	10		DPT 3		88						
485	15		DPT 4		75			▽ @ 15'-19' bgs Wet to saturated			
480	20		DPT 5		83			481.4 19.5 Orangish brown silty CLAY, High plasticity, Firm, Damp			
475	25		DPT 6		100			@ 25' bgs Soft to firm			
470	30		DPT 7		78			@ 30' bgs Trace fine grained sands, Moist			
465	35		DPT 8		5			465.9 35.0 @ 35'-50' bgs Minimum recovery Medium brown sandy CLAY, Fine grained, Soft, Saturated			
460	40		DPT 9		5						
455	45		DPT 10		5						
450	50		DPT 11		17			450.9 50.0 @ 50' bgs Orangish brown			
445	55		DPT 12		5						
	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring
NRS060
Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES: Type / Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
440	60	DPT 13		8						Bentonite Backfill (0'-75' bgs)
							435.9			
435	65	DPT 14		0			@ 65'-75' bgs No recovery 65.0			
430	70	DPT 15		0						
425	75						425.9 End of Boring at 75´ bgs 75.0			
420	80									
415	85									
410	90									
405	95									
400	100									
395	105									
390	110									
385	115									
380	120									
375	125									
	130									

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring
NRS061
Sheet 1 of 1

Date(s) Drilled	**1/31/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**42.5 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**502.4 ft above msl**
Borehole Backfill	**Bentonite Chips on 1/31/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 700,685.1 E 1,880,152.8**	Groundwater Level(s)	**15 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
502.4	0.0										
500.9	1.5							FILL: Medium brown silty CLAY, Low to moderate plasticity, Stiff, Damp			
500	0	DPT	1		78			FILL: Dark reddish brown and gray ASH/GRAVEL, Coarse grained, No plasticity, Very stiff, Damp			
497.4	5.0										
495	5	DPT	2		70			FILL: Dark blackish gray ASH, Medium grained, No plasticity, Stiff, Damp			
490	10	DPT	3		87			@ 13'-15' bgs Wet			
485.7	16.7							@ 15'-16.7' bgs Saturated			
485	15	DPT	4		100			Tannish orange silty CLAY, Moderate to high plasticity, Stiff, Damp			
480	20	DPT	5		100						
475	25	DPT	6		100						
470	30	DPT	7		100			@ 30' bgs Trace black mottling			
465.7	36.7										
465	35	DPT	8		100			Brownish orange to light tan CLAY, High plasticity, Stiff to very stiff, Damp			
460	40	DPT	9		100						
459.9	42.5							@ 42'- 42.5' bgs Trace bedrock fragments, Wet			
455	45							End of Boring at 42.5´ bgs			
450	50										
445	55										
	60										

Bentonite Backfill (0'-42.5' bgs)

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS062

Sheet 1 of 1

Date(s) Drilled	**1/30/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**33.0 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**502.9 ft above msl**
Borehole Backfill	**Bentonite Chips on 1/30/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 700,886.2 E 1,880,029.1**	Groundwater Level(s)	**30.0 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
500	0		DPT 1		58			502.9 0.0 FILL: Medium brown silty CLAY, Low to moderate plasticity, Stiff, Damp 501.4 1.5 FILL: Dark gray ASH/GRAVEL, Coarse grained, No plasticity, Very stiff, Damp 497.9 5.0 Orange silty CLAY, Trace fine grained silt, High plasticity, Soft, Moist			**Bentonite Backfill (0'-33' bgs)**
495	5		DPT 2		45						
490	10		DPT 3		88			@ 10' bgs Soft to dense, Damp			
485	15		DPT 4		62						
480	20		DPT 5		67			482.9 20.0 @ 19.5' bgs Dark brown, Damp Medium brown and gray silty CLAY, Trace gravel, High plasticity, Firm, Damp @ 20'-21.4' bgs Soft, Moist			
475	25		DPT 6		100			477.9 25.0 Medium brownish orange to light gray CLAY, High plasticity, Very stiff, Dry			
470	30		DPT 7		131			472.9 30.0 Silty CLAY, Medium to high plasticity, Stiff, Wet @ 31'-33' bgs Small angular pieces of limestone 469.9 33.0 End of Boring at 33´ bgs			
465	35										
460	40										
455	45										
450	50										
445	55										
	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring
NRS064
Sheet 1 of 1

Date(s) Drilled	**2/4/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**48.0 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**498.1 ft above msl**
Borehole Backfill	**Bentonite Chips on 2/4/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 700,602.5 E 1,880,028.2**	Groundwater Level(s)	**10.0 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
498.1	0.0										
497.1	1.0							FILL: Silty CLAY			
								FILL: Black ASH, Coarse grained, Stiff, Dry			**Bentonite Backfill (0'-48' bgs)**
495	0		DPT 1		100						
	5		DPT 2		100			@ 6'-10' bgs Dark gray, Fine grained			
490											
	10		DPT 3		100			@ 9' bgs Wet ▽ @ 10' bgs Saturated			
485											
	15		DPT 4		100						
480											
	20		DPT 5		100						
475.1	23.0							Brownish orange silty CLAY, Moderate plasticity, Damp			
475											
	25		DPT 6		100						
470											
	30		DPT 7		100			@ 30' bgs Orangish tan, Trace black mottling			
465											
	35		DPT 8		100						
460											
458.1	40.0							Brownish orange silty CLAY, Trace fine grained sand, Moderate plasticity, Firm, Damp			
	40		DPT 9		100			@ 43' bgs Fragments of limestone			
455											
	45		DPT 10		100			@ 45' bgs Damp			
450.1	48.0							End of Boring at 48´ bgs			
450											
	50										
445											
	55										
440											
	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS065

Sheet 1 of 1

Date(s) Drilled	**2/4/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**47.5 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**501.9 ft above msl**
Borehole Backfill	**Bentonite Chips on 2/4/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 700,626.2 E 1,880,485.4**	Groundwater Level(s)	**39.0 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
500	0	Hand Auger 1			100			501.9 0.0 500.9 GRAVEL 1.0 Medium brown silty CLAY, Low to moderate plasticity, Stiff, Damp			**Bentonite Backfill (0'-47.5' bgs)**
495	5	DPT 2			57			496.9 5.0 Brownish orange CLAY, Moderate to high plasticity, Stiff, Dry @ 8.4' bgs Chert lens			
490	10	DPT 3			100						
485	15	DPT 4			100			@ 15' bgs Stiff			
480	20	DPT 5			100			@ 20' bgs Trace black mottling, Damp			
475	25	DPT 6			100			476.9 25.0 Brownish orange silty CLAY, Trace limestone fragments, Low to moderate plasticity, Stiff, Damp			
470	30	DPT 7			100			@ 30' bgs Increase in clay, Black mottling, Stiff			
465	35	DPT 8			100			@ 35' bgs Very stiff			
460	40	DPT 9			100			462.9 39.0 ▽ Brownish orange sandy CLAY, Low plasticity, Soft, Wet @ 43' bgs Brownish orange silty CLAY, Fragments of limestone Moderate plasticity, Stiff, Damp			
455	45	DPT 10			100			@ 45' bgs Saturated 454.4 47.5			
450	50							End of Boring at 47.5´ bgs			
445	55										
	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS067

Sheet 1 of 1

Date(s) Drilled	**1/30/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Direct Push**	Drill Bit Size/Type	**Macro Core Sampler**	Total Depth of Borehole	**35.5 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**484.9 ft above msl**
Borehole Backfill	**Bentonite Chips on 1/30/20**	Sampling Method(s)	**1-inch liner core**	Hammer Data	**N/A**
Coordinate Location	**N 699,743.2 E 1,880,394.7**	Groundwater Level(s)	**35.0 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
485	0							484.9 0.0			
								483.8 Brownish orange silty CLAY, Low to moderate plasticity, Stiff, Damp 1.1			**Bentonite Backfill (0'-35.5' bgs)**
480	5	DPT	1		67			482.4 Dark gray ASH/GRAVEL, Coarse grained, No plasticity, Very stiff, Damp 2.6			
		DPT	2		43			Orange silty CLAY, Trace fine grained silt, High plasticity, Soft, Moist			
475	10	DPT	3		45			@ 11.7' bgs Grayish orange, Soft to firm, Damp to moist			
470	15	DPT	4		40						
465	20	DPT	5		55			464.9 20.0 Medium brown and gray silty CLAY, High plasticity, Firm, Damp			
460	25	DPT	6		62			@ 25' bgs Brownish gray, Trace black mottling, Soft, Damp			
455	30	DPT	7		68			@ 29'-30' bgs Limestone fragments @ 30' bgs Soft to firm @ 31.1'-31.4' bgs Small angular pieces of limestone and chert @ 32'-35' bgs Medium to dark brown, Soft to firm, Moist			
450	35	DPT	8		33			449.4 @ 32.4' bgs Small angular pieces of limestone and chert 35.5 @ 35' -35.5' bgs Limestone fragments, Wet End of Boring at 35.5´ bgs			
445	40										
440	45										
435	50										
430	55										
425	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Monitoring Well GAF-526U

Date(s) Drilled	**3/11/20 to 3/12/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Rotosonic**	Drill Bit Size/Type	**Nominal 4", 6" (Sonic)**	Total Depth of Borehole	**95.0 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**476.03 ft above msl**
Borehole Backfill	**Monitoring Well - Installed 3/13/20 (Formerly NRS068)**	Sampling Method(s)	**6-inch sonic**	Hammer Data	**N/A**
Coordinate Location	**N 699,778.3 E 1,879,350.3**	Groundwater Level(s)	**N/A**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											Top of Casing 478.88 msl
475	0	SONIC	1		68	3.5		476.0 0.0 FILL: Brownish orange silty CLAY, Trace oragnics, Trace dark brown soils, Low to moderate plasticity, Stiff, Friable, Damp 473.8 2.2			
470	5							Orange silty CLAY, Trace fine grained silt, Moderate plasticity, Firm, Moist			Portland Grout (0'-5' bgs)
465	10	SONIC	2		74	4.0		@ 10' bgs Increase in silt, Lower plasticity, Stiff, Dry			
460	15										2" Diameter PVC Riser (0'-63' bgs)
455	20	SONIC	3		94	1.0		456.0 20.0 Dark orange CLAY SILT, Low plasticity, Soft, Friable, Dry			
450	25							449.0 27.0 Orangish brown silty CLAY, Trace gravel/chert, Organic matter, Black mottling, Moderate plasticity, Firm, Dry			
445	30										Bentonite Seal (5'-61' bgs)
440	35	SONIC	4		100	1.5		443.0 33.0 Orange sandy CLAY, Fine grained sand, Low to moderate plasticity, Firm, Damp			
435	40							@ 40'-50' bgs Trace gravel, Firm			
430	45	SONIC	5		100	2.5		@ 47'-50' bgs Decrease in sands			
425	50							@ 50'-55.5' bgs Increase in cobble stones in various sizes and increase in sand, Wet			
420	55	SONIC	6		100	2.0		@ 55.5'-59.7' bgs Mix of rounded GRAVEL and cobblestones and clayey sand, Medium to fine grained @ 57.3' bgs Brownish orange maroon and gray staining @ 58.1' bgs Low plasticity, Wet			
	60										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Monitoring Well GAF-526U

Elevation, feet	Depth, feet	SAMPLES: Type / Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
415	60						@ 59.7'-60' bgs Medium brown clay lense, High plasticity, Firm, Damp @ 60' bgs Medium to dark in color, Moist to wet		2" Diameter PVC Riser (0'-63' bgs) Sand Pack #2 (61'-69' bgs)	
410	65	SONIC 7		100	3.5				0.010 Slot 2" Diameter PVC Screen (63'-68' bgs)	
405	70						@ 68'-70' bgs Layering of medium brown limestone and silty CLAY, Firm, Damp pH: 4-4.5		Solid PVC End Cap	
400	75	SONIC 8		98	3.5				Bentonite Backfill (69'-95' bgs)	
395	80						@ 77.5'-80' bgs Weathered rock 396.0 80.0 Medium brown weathered ROCK/silty CLAY, Low to medium plasticity, Damp			
390	85	SONIC 9		80	1.5		pH: 5.5+			
385	90						386.0 90.0 LIMESTONE, Microcrystalline, Fresh, Medium hard, Dry			
380	95	SONIC 10		88	N/A		381.0 95.0 End of Boring at 95´ bgs			
375	100									
370	105									
365	110									
360	115									
355	120									
350	125									
	130									

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Monitoring Well GAF-541U

Sheet 1 of 2

Date(s) Drilled	**3/9/20**	Logged By	**E. House**	Checked By	**N. Demers**
Drilling Method	**Rotosonic**	Drill Bit Size/Type	**Nominal 4", 6" (Sonic)**	Total Depth of Borehole	**70.1 feet**
Drill Rig Type	**Geoprobe 8420**	Drilling Contractor	**Cascade**	Surface Elevation	**500.85 ft above msl**
Borehole Backfill	**Monitoring Well - Installed 3/10/20 (Formerly NRS069)**	Sampling Method(s)	**6-inch sonic**	Hammer Data	**N/A**
Coordinate Location	**N 700,473.7 E 1,880,436.6**	Groundwater Level(s)	**N/A**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											Top of Casing 503.44 msl
500	0							500.9 / 0.0 499.9 Medium brown silty CLAY, Low to moderate plasticity, Stiff, Damp 1.0			
495	5	SONIC	1		100	N/A		Dark gray to black ASH, Mix of fly/bottom ash, Trace gravel, Fine to medium grained, Loose, Damp			
490	10	SONIC	2		100	1.0		@ 10' bgs Increase in gravel, Wet			
485	15										2" Diameter PVC Riser (0'-58' bgs)
480	20	SONIC	3		100	1.0		482.2 / 18.7 Brownish orange silty CLAY, High plasticity, Soft, Damp			
475	25										
470	30	SONIC	4		100	1.0		@ 30' bgs Trace fine grained sand and limestone, Damp			Bentonite Seal (0'-56 bgs)
465	35										
460	40	SONIC	5		100	1.0		460.9 / 40.0 Light brownish orange silty CLAY, Trace fine grained snad, Moderate plasticity, Soft, Damp			
455	45							pH: Between 4 and 4.5			
450	50	SONIC	6		100	2.0		@ 53'-55' bgs Limestone/chert fragments, Damp			
445	55										Sand Pack #2 (56'-63' bgs)
	60							440.9 / 60.0			0.010 Slot 2" Diameter PVC Screen (58'-63' bgs)

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Monitoring Well GAF-541U

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
440	60	SONIC	7		100	2.0		Brown orange silty CLAY, Trace black mottling, Trace fine grained sand, Pieces of chert, Moderate plasticity, Firm, Moist			0.010 Slot 2" Diameter PVC Screen (58'-63' bgs)
435	65						434.5	66.4			Solid PVC End Cap
		SONIC	8		100	N/A		Medium gray LIMESTONE, Microcrystalline, Strong, Fresh, Competent			Sand Pack #2 (56'-65' bgs)
430	70						430.8	70.1			Bentonite Backfill (65'-70.1' bgs)
425	75							End of Boring at 70.1´ bgs			
420	80										
415	85										
410	90										
405	95										
400	100										
395	105										
390	110										
385	115										
380	120										
375	125										
	130										

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Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring NRS070

Sheet 1 of 2

Date(s) Drilled	3/10/20 to 3/11/20	Logged By	E. House	Checked By	N. Demers
Drilling Method	Rotosonic	Drill Bit Size/Type	Nominal 4", 6", 7", 8", 9" (Sonic)	Total Depth of Borehole	70.0 feet
Drill Rig Type	Geoprobe 8420	Drilling Contractor	Cascade	Surface Elevation	483.1 ft above msl
Borehole Backfill	Bentonite Chips on 3/11/20	Sampling Method(s)	6-inch sonic	Hammer Data	N/A
Coordinate Location	N 699,604.7 E 1,880,299.8	Groundwater Level(s)	N/A		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
480	0							483.1 0.0 FILL: Brownish orange silty CLAY, Low to moderate plasticity, Stiff, Damp			Bentonite Backfill (0'-70' bgs)
								480.6 2.5 FILL: Dark gray ASH/GRAVEL, Coarse grained, No plasticity, Very stiff, Damp			
475	5	SONIC	1		90	2.0		478.1 5.0 Orange sitly CLAY, Trace fine grained silt, High plasticity, Soft, Moist			
470	10							@ 10' bgs Orangish grayish brown @ 10'-13' bgs Trace small fragments of coal			
	15	SONIC	2		89	1.5		@ 17' bgs Trace organic matter			
465	20							@ 20' bgs Increase in silt, Trace roots, Moderate plasticity, Firm			
460	25	SONIC	3		100	2.5					
455	30							453.1 30.0 Light brown silty CLAY, Trace gravel, Low to moderate plasticity, Firm, Damp			
450	35	SONIC	4		99	4.0		448.6 34.5 @ 34.5'-40' bgh Brownish orange CLAY, Trace silt, Stiff, Dry			
445	40							441.0 42.1 Light brownish orange silty CLAY, Trace chert, Low plasticity, Stiff, Damp			
440	45	SONIC	5		100	4.5					
435	50							@ 50' bgs Trace chert and gravel			
430	55	SONIC	6		100	3.5		429.1 54.0 @ 53.7' bgs Trace black mottling, Damp Clayey SAND, Medium grained, Small cobblestones and chert, Wet 426.1 57.0 CLAY, Stiff, Dense, Damp			
425	60										

Report: GEO_CR_WELL; File C:\USERS\NADINE.DEMERS\DESKTOP\NRS\GAF NRS BORING LOGS- 2020.GPJ; 7/14/2020 2:38:03 PM

AECOM

Project: GAF NRS Treatablility
Project Location: Gallatin, TN
Project Number: 60621225

Log of Boring
NRS070
Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES: Type / Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
420	60						@ 60'-63.5' bgs Trace silt			Bentonite Backfill (0'-70' bgs)
							419.6 63.5			
415	65	SONIC 7		88	3.5		Light gray LIMESTONE, Microcrystalline, Laminated, Powder like, Fresh, Medium hard, Dry			
410	70						413.1 70.0			
							End of Boring at 70´ bgs			
405	75									
400	80									
395	85									
390	90									
385	95									
380	100									
375	105									
370	110									
365	115									
360	120									
355	125									
	130									

Report: GEO_CR_WELL; File C:\USERS\NADINE.DEMERS\DESKTOP\NRS\GAF NRS BORING LOGS- 2020.GPJ; 7/14/2020 2:38:03 PM

AECOM

NRS 2015 Field Investigation Boring Logs

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS001 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/12/2015 **DATE FINISHED:** 3/12/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams **NORTH:** 699633.4599 **EAST:** 1879431.647

GROUND SURFACE ELEVATION: 476.8438 **BORING DEPTH:** 60.3' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH 3 *to* 11 S.U.
476.8	0	0.25				TOPSOIL: very soft, moist, brown to gray, SILT with little clay, contains roots	OL			
		4.0				CLAY: stiff to soft, dry, light brown, with little fine sand, mottled with light gray and dark gray	CL			
		4.0		87						
		2.5								
		0.75	(4.0-5.0)					3.9		
	-5	4.5				CLAY: stiff to soft, brown, mottled with light gray and dark gray				
470.0		4.0								
		1.5		100						
		1.5								
		1.5	(9.0-10.0)					3.9		
	-10	3.0								
			(10.6-11.2)					5.2		
		4.0				CLAY: stiff to medium stiff, dry, yellowish-orange, with little fine sand, mottled with light and dark gray				
		4.0		100						
		4.0								
		3.0	(14.0-15.0)					3.9		
	-15	2.25								
460.0		1.5								
		2.5				ASH: very loose, dry, black, well-graded, SAND with little fine gravel (subangular to angular)	ASH			
		3.0	(17.7-18.0)	100				4.9		
		1.5				CLAY: soft, dry, yellowish-orange, with little fine sand, mottled with light and dark gray	CL			
		1.0	(19.0-20.0)					4.3		
	-20	4.0				CLAY: stiff, yellowish-orange and light gray mottled, with frequent partings of light brown fine sand from 21 - 21.5				
		4.0								
						SILTY SAND: stiff, dry, light brown, fine-grained	SM	4.8		

URS

NRS001 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS001

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS001 | **PROJECT NAME:** TVA GAF NRS

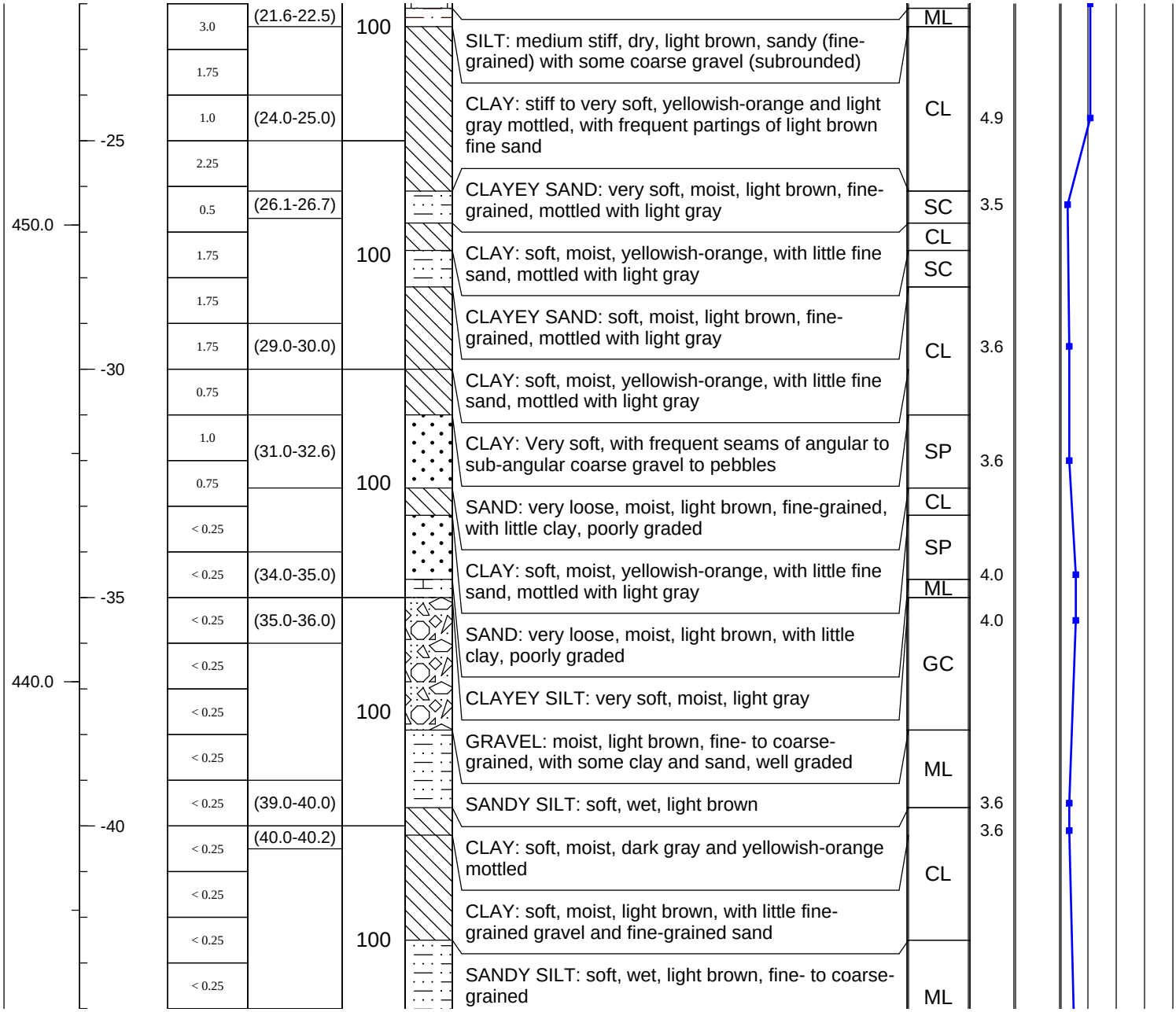
DATE BEGAN: 3/12/2015 | **DATE FINISHED:** 3/12/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams | **NORTH:** 699633.4599 | **EAST:** 1879431.647

GROUND SURFACE ELEVATION: 476.8438 | **BORING DEPTH:** 60.3' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling



NRS001 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS001

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS001 **PROJECT NAME:** TVA GAF NRS

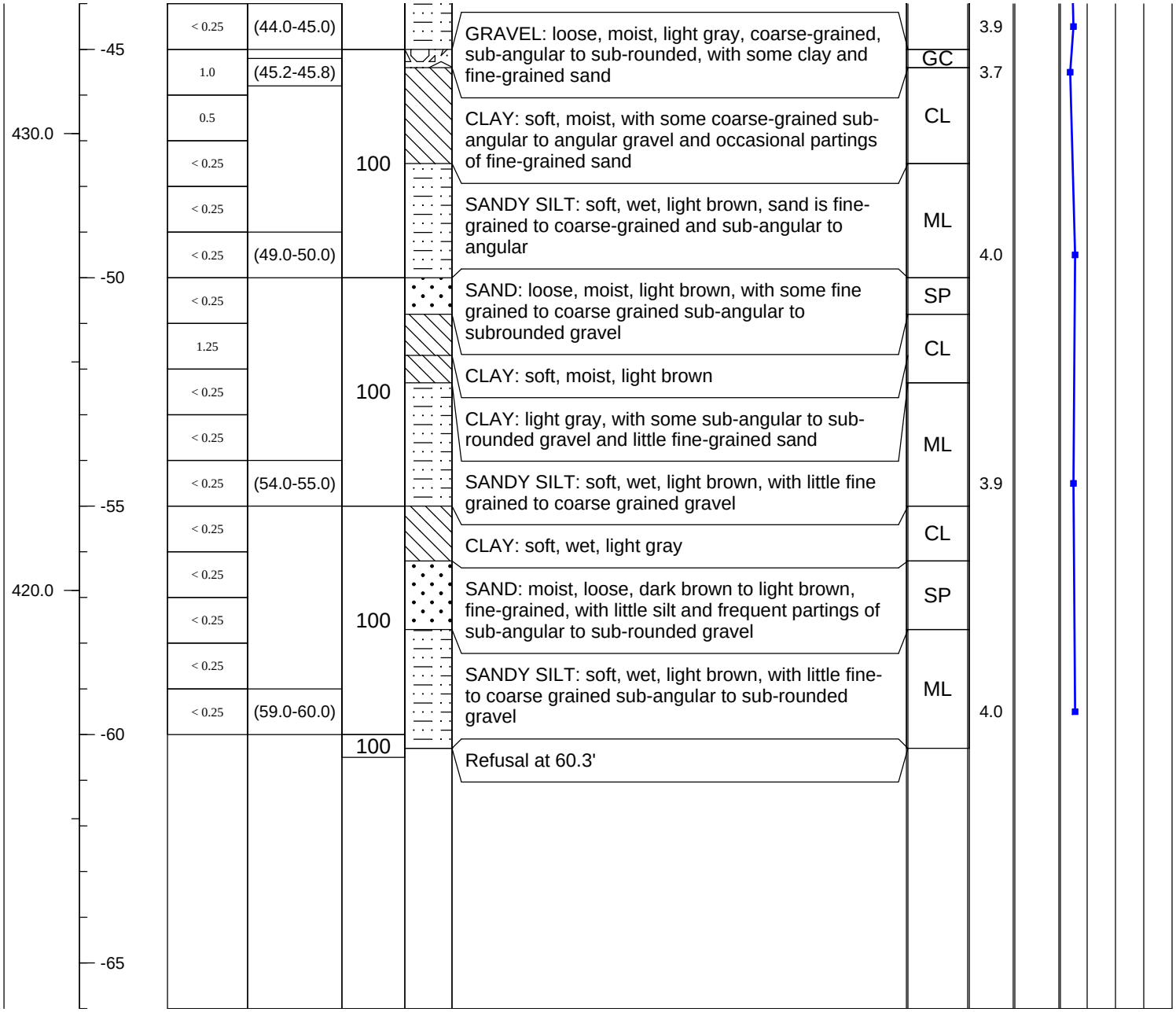
DATE BEGAN: 3/12/2015 **DATE FINISHED:** 3/12/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams **NORTH:** 699633.4599 **EAST:** 1879431.647

GROUND SURFACE ELEVATION: 476.8438 **BORING DEPTH:** 60.3' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling



NRS001 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS001

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS002 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/16/2015 **DATE FINISHED:** 3/16/15 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams **NORTH:** 699889.4444 **EAST:** 1879278.736

GROUND SURFACE ELEVATION: 476.5725 **BORING DEPTH:** 55.6' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
470.0	0	4.5		100		CLAY: stiff, dry, light brown, with little fine sand and silt				
		4.5								
		2.5								
		2.5								
		2.5	(4.0-5.0)					4.8		
	-5	1.25								
		0.5		100						
		0.5								
		1.5								
		3.5				CLAY: brown and light gray mottled				
		3.5								
		3.0	(9.0-10.0)					4.4		
	-10	2.5		97			CL			
		3.5								
		1.5								
		4.25				CLAY: yellowish-orange and light gray mottled				
		4.5								
		4.75	(14.0-15.0)					4.7		
	-15	1.0								
460.0		0.5		100						
		1.0								
		1.5	(17.8-17.9)					5.6		
		2.5	(17.9-18.4)			CLAY: gray-brown to brown		5.6		
		4.5								
		4.0	(19.0-20.0)					5.0		
	-20					CLAYEY SILT: soft, dry, light brown				
		1.75					ML/CL			

URS

NRS002 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS002

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS002 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/16/2015 **DATE FINISHED:** 3/16/15 **FIELD ENGINEER:** Joseph Kiker

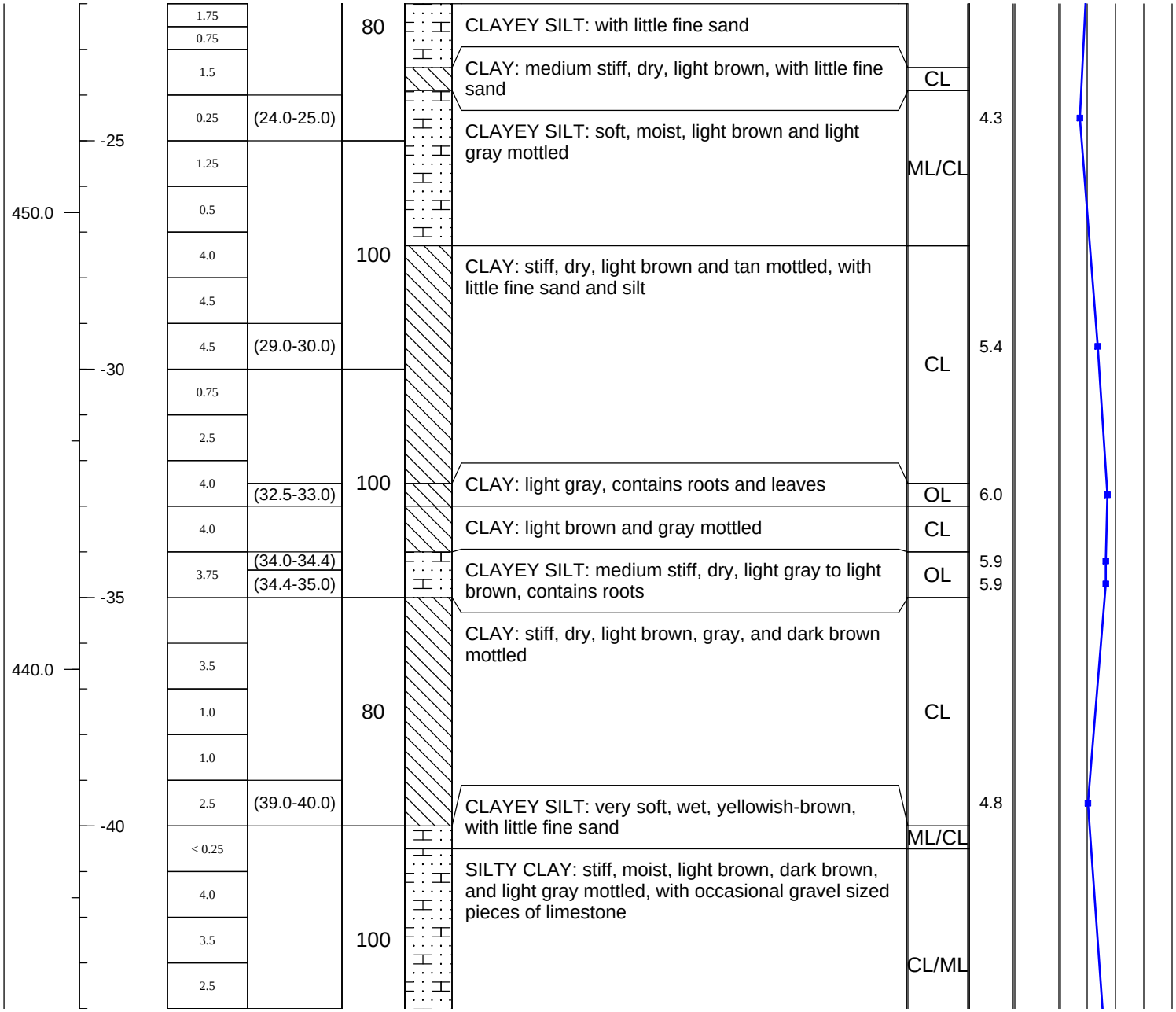
DRILLER: Tyler Williams **NORTH:** 699889.4444 **EAST:** 1879278.736

GROUND SURFACE ELEVATION: 476.5725 **BORING DEPTH:** 55.6' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH 3 to 11 S.U.
450.0	-25	1.75		80		CLAYEY SILT: with little fine sand				
		0.75								
		1.5				CLAY: medium stiff, dry, light brown, with little fine sand	CL			
		0.25	(24.0-25.0)			CLAYEY SILT: soft, moist, light brown and light gray mottled	ML/CL	4.3		
		1.25		100						
		0.5								
		4.0				CLAY: stiff, dry, light brown and tan mottled, with little fine sand and silt	CL			
		4.5								
	-30	4.5	(29.0-30.0)					5.4		
		0.75		100						
		2.5								
		4.0	(32.5-33.0)			CLAY: light gray, contains roots and leaves	OL	6.0		
		4.0				CLAY: light brown and gray mottled	CL			
		3.75	(34.0-34.4)			CLAYEY SILT: medium stiff, dry, light gray to light brown, contains roots	OL	5.9		
			(34.4-35.0)					5.9		
440.0	-35					CLAY: stiff, dry, light brown, gray, and dark brown mottled	CL			
		3.5		80						
		1.0								
		1.0								
		2.5	(39.0-40.0)			CLAYEY SILT: very soft, wet, yellowish-brown, with little fine sand	ML/CL	4.8		
	-40	< 0.25				SILTY CLAY: stiff, moist, light brown, dark brown, and light gray mottled, with occasional gravel sized pieces of limestone	CL/ML			
		4.0								
		3.5		100						
		2.5								



NRS002 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS002

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS002 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/16/2015 **DATE FINISHED:** 3/16/15 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams **NORTH:** 699889.4444 **EAST:** 1879278.736

GROUND SURFACE ELEVATION: 476.5725 **BORING DEPTH:** 55.6' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH 3 *to 11 S.U.*
		2.5	(44.0-45.0)					5.8		
	-45	< 0.25								
		< 0.25				CLAYEY SILT: very soft, wet, yellowish-brown, with little sub-angular to angular gravel	ML/CL			
430.0		4.5		100		SILTY CLAY: stiff, dry, lgiht brown, with some fine to coarse subrounded to sub-angular gravel and little sand				
		4.5	(47.0-50.0)				CL/ML	5.7		
		4.5								
	-50	< 0.25				CLAYEY SILT: very soft, wet, yellowish-brown, with little sub-angular to angular gravel	ML/CL			
		< 0.25								
		4.5		100		SILTY CLAY: stiff, dry, light brown, with some fine to coarse subrounded to sub-angular gravel and little sand				
		4.5					CL/ML			
		4.5	(54.0-55.0)					6.1		
	-55			0		Refusal at 55.6'				
420.0										
	-60									
	-65									

NRS002 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS002

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS003 | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/17/2015 | **DATE FINISHED:** 3/17/2015 | **FIELD ENGINEER:** Joseph Kiker

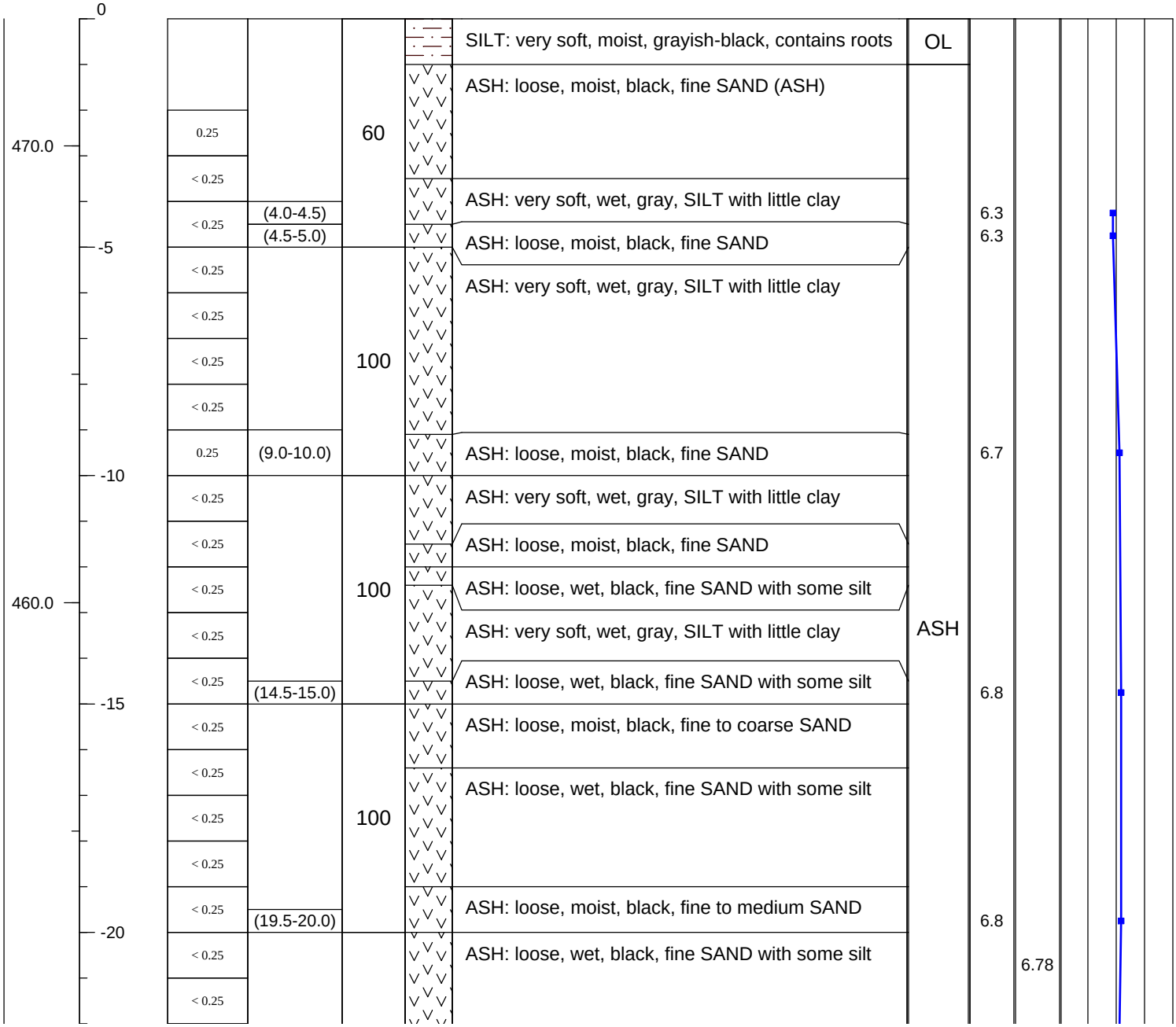
DRILLER: Tyler Williams | **NORTH:** 699820.3168 | **EAST:** 1879444.532

GROUND SURFACE ELEVATION: 472.7828 | **BORING DEPTH:** 54.6' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
470.0	0	0.25		60		SILT: very soft, moist, grayish-black, contains roots	OL		
						ASH: loose, moist, black, fine SAND (ASH)			
		< 0.25							
		< 0.25	(4.0-4.5)			ASH: very soft, wet, gray, SILT with little clay		6.3	
	-5	< 0.25	(4.5-5.0)			ASH: loose, moist, black, fine SAND		6.3	
		< 0.25		100		ASH: very soft, wet, gray, SILT with little clay			
		< 0.25							
		< 0.25							
		< 0.25							
		0.25	(9.0-10.0)			ASH: loose, moist, black, fine SAND		6.7	
	-10	< 0.25		100		ASH: very soft, wet, gray, SILT with little clay			
		< 0.25				ASH: loose, moist, black, fine SAND			
460.0		< 0.25				ASH: loose, wet, black, fine SAND with some silt	ASH		
		< 0.25				ASH: very soft, wet, gray, SILT with little clay			
		< 0.25	(14.5-15.0)			ASH: loose, wet, black, fine SAND with some silt		6.8	
	-15	< 0.25		100		ASH: loose, moist, black, fine to coarse SAND			
		< 0.25				ASH: loose, wet, black, fine SAND with some silt			
		< 0.25							
		< 0.25							
		< 0.25	(19.5-20.0)			ASH: loose, moist, black, fine to medium SAND		6.8	
	-20	< 0.25				ASH: loose, wet, black, fine SAND with some silt			6.78
		< 0.25							



NRS003 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS003

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS003 | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/17/2015 | **DATE FINISHED:** 3/17/2015 | **FIELD ENGINEER:** Joseph Kiker

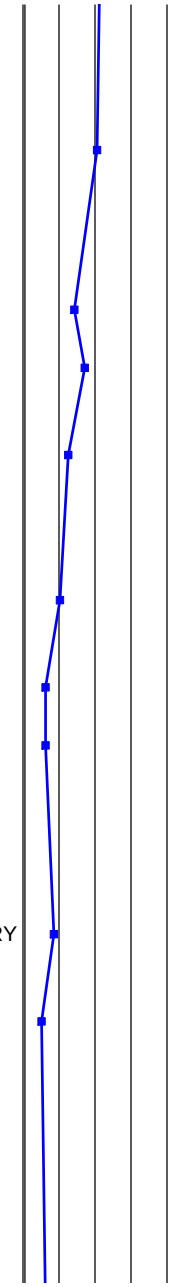
DRILLER: Tyler Williams | **NORTH:** 699820.3168 | **EAST:** 1879444.532

GROUND SURFACE ELEVATION: 472.7828 | **BORING DEPTH:** 54.6' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
450.0		< 0.25		100					
		< 0.25				ASH: loose, moist, black, fine to coarse SAND			
		< 0.25	(24.0-25.0)					6.6	
	-25	< 0.25							
		< 0.25				SILT: very soft, light brown, with little fine sand	ML		
		< 0.25	(27.0-27.5)	100				5.5	
		< 0.25	(28.0-28.5)			ASH: loose, moist, black, fine to coarse SAND	ASH	6.0	
		< 0.25	(29.5-30.0)			CLAY: soft, moist, light brown to dark brown, with little fine sand (ALLUVIUM)		5.2	
	-30	< 0.25							
		< 0.25							
		0.75	(32.0-32.5)	76				4.8	
440.0		0.75	(33.5-34.0)			CLAY: medium stiff, with little fine to coarse rounded to sub-angular gravel, becoming more silty at 34.5'		4.1	
		1.5	(34.5-35.0)					4.1	
	-35								
		< 0.25		60					
		< 0.25	(37.0-39.0)					4.5	DRY
		1.5	(39.0-40.0)					3.9	
	-40	< 0.25							
		< 0.25					CL		
		< 0.25		40					
430.0		< 0.25							



NRS003 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS003

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS003 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/17/2015 **DATE FINISHED:** 3/17/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams **NORTH:** 699820.3168 **EAST:** 1879444.532

GROUND SURFACE ELEVATION: 472.7828 **BORING DEPTH:** 54.6' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-45	0.5	(44.0-45.0)					4.1		
		< 0.25		77						
		< 0.25								
		< 0.25								
		< 0.25								
		< 0.25	(49.0-50.0)					6.3		
	-50	< 0.25		100						
		< 0.25								
		< 0.25								
420.0		< 0.25	(53.0-53.9)					6.8		
		< 0.25				PWR: weathered limestone	PWR			
	-55					refusal at 54.6'				
	-60									
410.0										
	-65									

NRS003 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS003

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS004 | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/18/2015 | **DATE FINISHED:** 3/18/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams | **NORTH:** 699791.1783 | **EAST:** 1879406.328

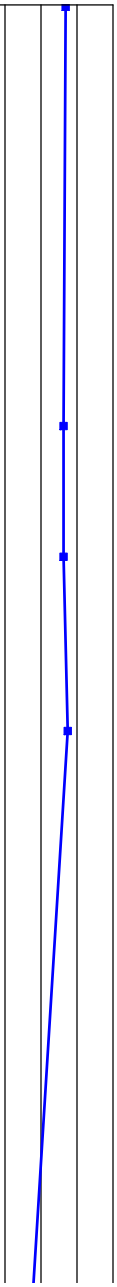
GROUND SURFACE ELEVATION: 471.9496 | **BORING DEPTH:** 59.6' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	DESCRIPTION	USCS	SOIL pH	WATER pH
470.0	0		(0.0-0.08)	2	SILT: very soft, moist, grayish-black, contains roots	OL	7.7	
					ASH: very soft, wet, gray, SILT with little clay (ASH)			
	-5	< 0.25						
		< 0.25						
		< 0.25	(7.0-7.5)	100			7.6	
		0.25						
		< 0.25	(9.0-10.0)		ASH: loose, moist, black, fine SAND		7.6	
	-10	0.25		90	ASH: fine to coarse SAND with little fine gravel	ASH		
460.0		0.25						
		1.5	(12.0-13.0)				7.8	
		1.25						
		0.75						
	-15	< 0.25		100	ASH: very soft, wet, gray, SILT with little clay			
		< 0.25						
		< 0.25			ASH: fine to coarse SAND with little fine gravel			
		< 0.25			ASH: very soft, wet, gray, SILT with little clay			
		< 0.25						
	-20							
		1.75			CLAY: medium stiff, moist, light brown to dark brown, with little fine sand (ALLUVIUM)			
450.0								

SOIL pH GRAPH *3 to 11 S.U.*



NRS004 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS004

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS004 | **PROJECT NAME:** TVA GAF NRS

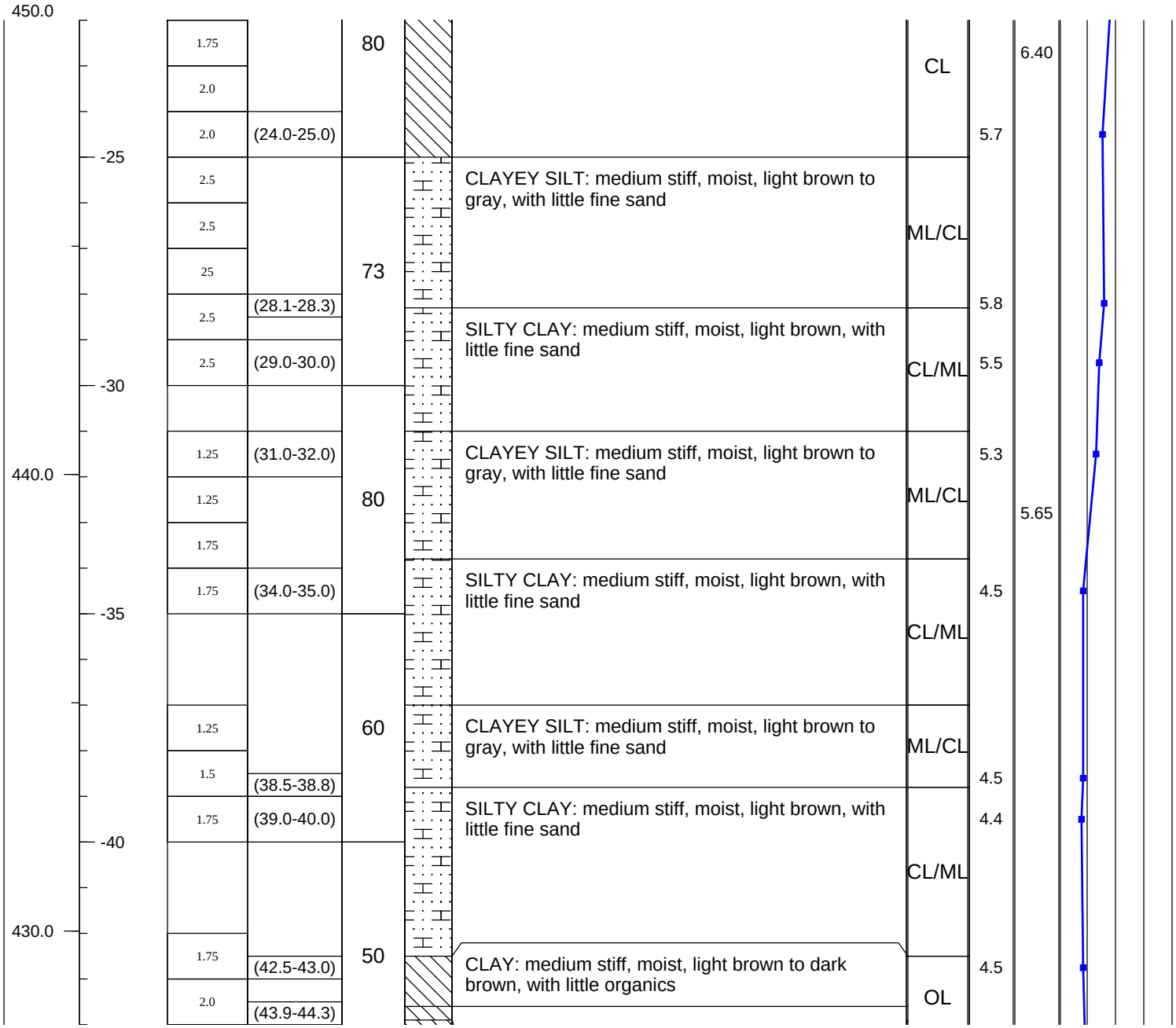
DATE BEGAN: 3/18/2015 | **DATE FINISHED:** 3/18/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams | **NORTH:** 699791.1783 | **EAST:** 1879406.328

GROUND SURFACE ELEVATION: 471.9496 | **BORING DEPTH:** 59.6' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling



NRS004 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS004

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS004 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/18/2015 **DATE FINISHED:** 3/18/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams **NORTH:** 699791.1783 **EAST:** 1879406.328

GROUND SURFACE ELEVATION: 471.9496 **BORING DEPTH:** 59.6' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-45	2.0	(44.3-45.0)	60		CLAY: with fine to coarse gravel CLAY: with redish-brown to black organic material CLAY: light brown, lacks organics	CL	4.6 5.0		
		4.0				CLAY: with fine to coarse gravel, majority limestone				
		4.0	(49.0-50.0)					5.5		
	-50			40						
420.0		1.75								
		1.75	(54.0-55.0)					5.0		
	-55		(55.0-56.0)					6.1		
				7		refusal at 59.6'				
	-60									
410.0										
	-65									

NRS004 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS004

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS005 | **PROJECT NAME:** TVA GAF NRS

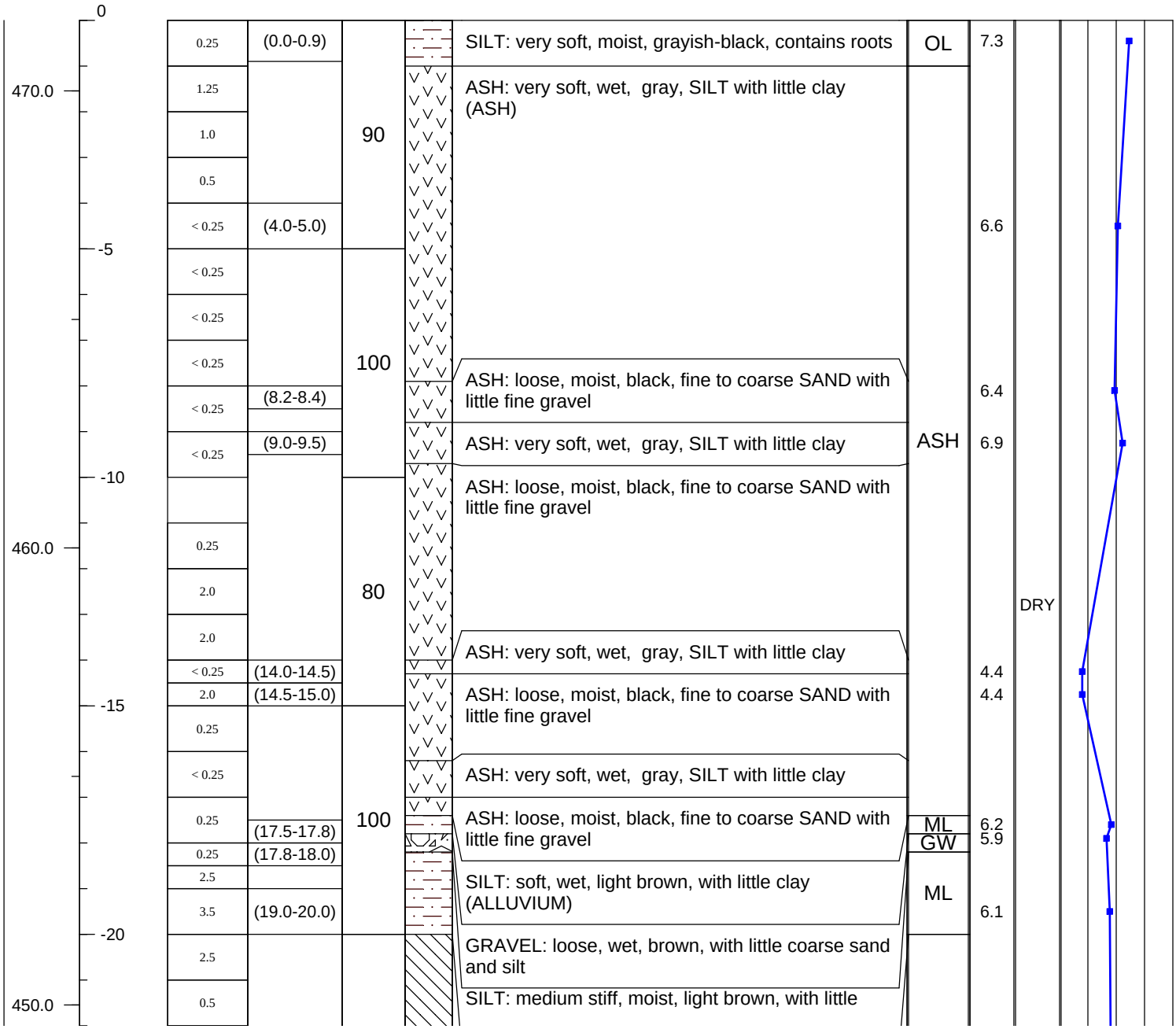
DATE BEGAN: 3/18/2015 | **DATE FINISHED:** 3/18/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams | **NORTH:** 699730.455 | **EAST:** 1879434.426

GROUND SURFACE ELEVATION: 471.5444 | **BORING DEPTH:** 61.7' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling



NRS005 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS005

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS005 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/18/2015 **DATE FINISHED:** 3/18/2015 **FIELD ENGINEER:** Joseph Kiker

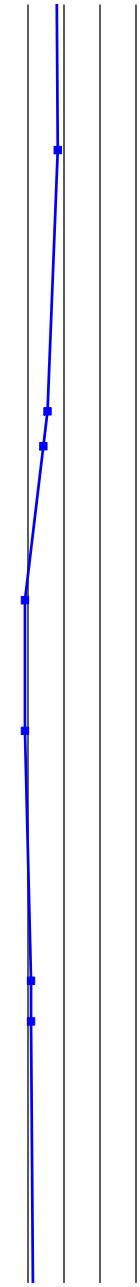
DRILLER: Tyler Williams **NORTH:** 699730.455 **EAST:** 1879434.426

GROUND SURFACE ELEVATION: 471.5444 **BORING DEPTH:** 61.7' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH 3 *to 11 S.U.*
		0.5		100		clay and fine sand				
		0.5				CLAY: medium stiff to very soft, moist, light brown with little fine sand				
		< 0.25	(24.0-25.0)					6.2		
	-25						CL			
		0.25		65						
		0.25								
		2.0	(28.7-29.2)			CLAY: light gray, dark brown, and light brown mottled		5.7		
			(29.2-30.0)					5.5		
	-30									
440.0										
		0.25	(32.0-32.5)	60		SAND: loose, wet, light tan-brown, fine grained, with little silt, well graded	SW	4.6	6.39	
		0.75				CLAY: soft, moist, light brown, with some fine sand and little fine to medium gravel of various roundness/angularity				
		2.0	(34.0-35.0)					4.6		
	-35						CL			
		1.0								
		1.0								
		1.0		97						
		1.0				GRAVEL: loose, dry, red to black, fine to coarse grained, with little coarse sand				
			(38.7-38.9)				GP	4.9		
		0.5	(39.0-40.0)			CLAY: medium stiff, moist, gray, with little fine to coarse sand and little fine sub-angular to angular gravel	CL	4.9		
		2.5								
	-40									
		1.5					GW		6.15	
430.0		0.25				GRAVEL: loose, wet, light tan brown, sub-angular to angular, with little silt	OL			
		3.5		100		CLAY: medium stiff, moist, brown, with fine to coarse gravel, contains organics				
		2.0								



URS

NRS005 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS005

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS005 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/18/2015 **DATE FINISHED:** 3/18/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams **NORTH:** 699730.455 **EAST:** 1879434.426

GROUND SURFACE ELEVATION: 471.5444 **BORING DEPTH:** 61.7' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-45	2.0	(44.0-45.0)	47		CLAY: lacks organics	CL	5.0		
		> 4.5								
		> 4.5								
		> 4.5	(49.0-50.0)					5.2		
	-50			40						
420.0										
		> 4.5								
		> 4.5	(54.0-55.0)					5.3		
	-55			10						
		> 4.5	(59.5-60.0)					5.7		
	-60		(60.0-61.7)	34		refusal at 61.7'		7.0		
410.0		0.25								
	-65									

URS

NRS005 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS005

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS006 | **PROJECT NAME:** TVA GAF NRS

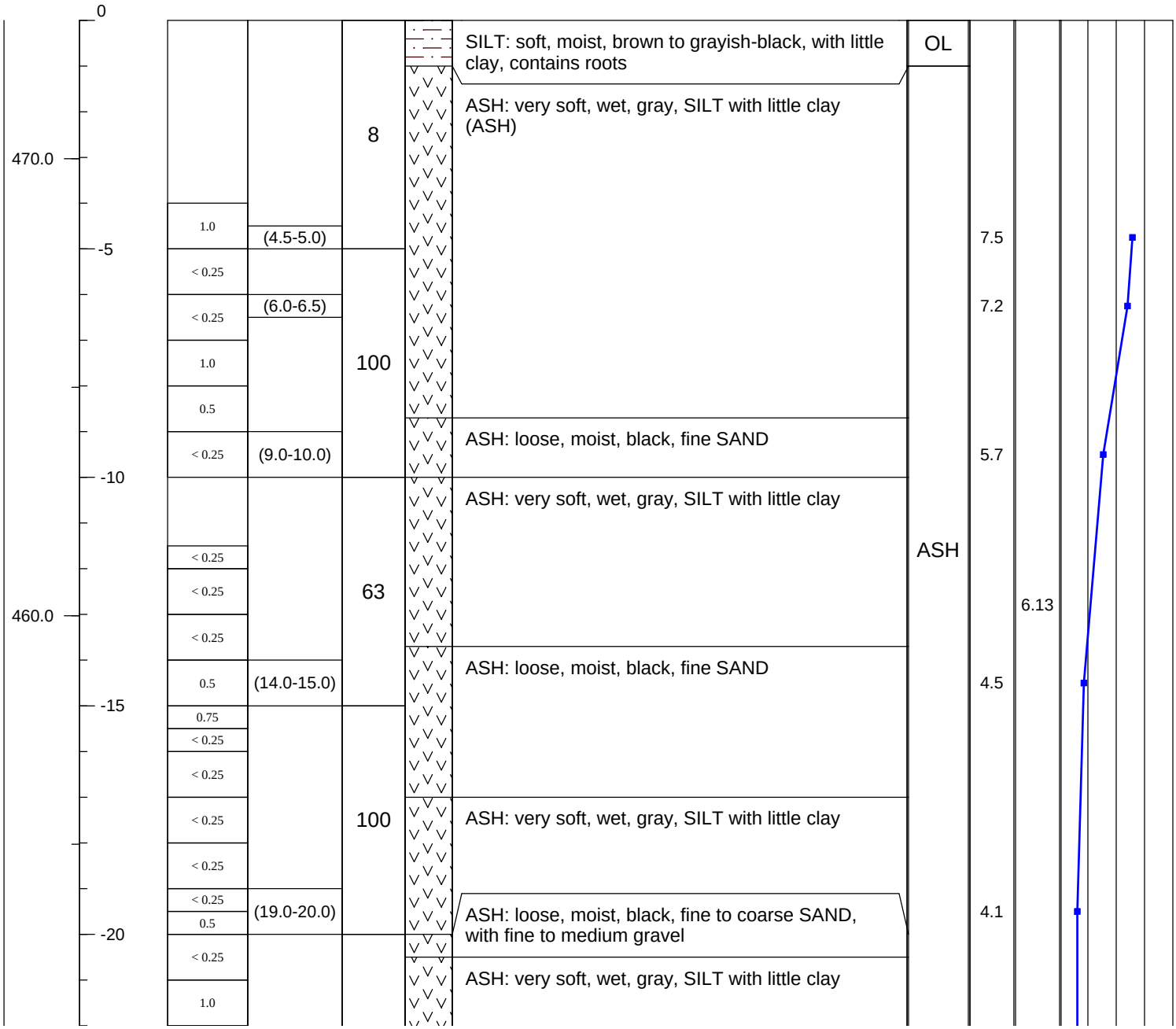
DATE BEGAN: 3/19/2015 | **DATE FINISHED:** 3/19/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams | **NORTH:** 699827.2166 | **EAST:** 1879371.657

GROUND SURFACE ELEVATION: 473.029 | **BORING DEPTH:** 55.7' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling



NRS006 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS006

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS006 | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/19/2015 | **DATE FINISHED:** 3/19/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams | **NORTH:** 699827.2166 | **EAST:** 1879371.657

GROUND SURFACE ELEVATION: 473.029 | **BORING DEPTH:** 55.7' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH 3 *to 11 S.U.*
450.0		0.25	(22.3-23.0)	100		CLAY: medium stiff, light brown to dark brown to light brown, with little fine sand (ALLUVIUM)	CL	4.1		
		4.0	(23.0-23.5)					4.3		
		1.0	(24.0-25.0)					4.2		
	-25					SILTY CLAY: medium stiff, moist, light brown and light gray mottled, with little fine sand				
		1.5		62						
		1.5								
		1.0	(29.0-30.0)					4.7		
	-30									
		0.75								
		0.75		70						
440.0		0.75								
		1.5	(34.0-35.0)					4.4	DRY	
	-35									
		0.75		65						
		1.0								
		1.0	(39.0-40.0)					4.5		
	-40						CL/ML			
		1.0		58						
430.0		1.5								

URS

NRS006 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS006

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS006 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/19/2015 **DATE FINISHED:** 3/19/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams **NORTH:** 699827.2166 **EAST:** 1879371.657

GROUND SURFACE ELEVATION: 473.029 **BORING DEPTH:** 55.7' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH 3 *to 11 S.U.*
420.0	-45	2.0	(44.6-50.0)	50		SILTY CLAY: with reddish-brown to black organic material	OL	4.6		
						SILTY CLAY: light brown to dark brown, with ocassional fine to medium gravel and pebbles throughout				
		4.0								
		1.5								
	-50	1.5		0			CL/ML			
	-55			0		refusal at 55.7'				
	-60									

URS	NRS006 Boring Log TVA Gallatin Non-Registered Site 1499 Steam Plant Rd., Gallatin, TN 37066 Sumner Co., Tennessee	DRAWN BY: JMK	CHECKED BY: AC	PROJECT NO: 31853391
PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT		SHEET: NRS006		

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS007 | **PROJECT NAME:** TVA GAF NRS

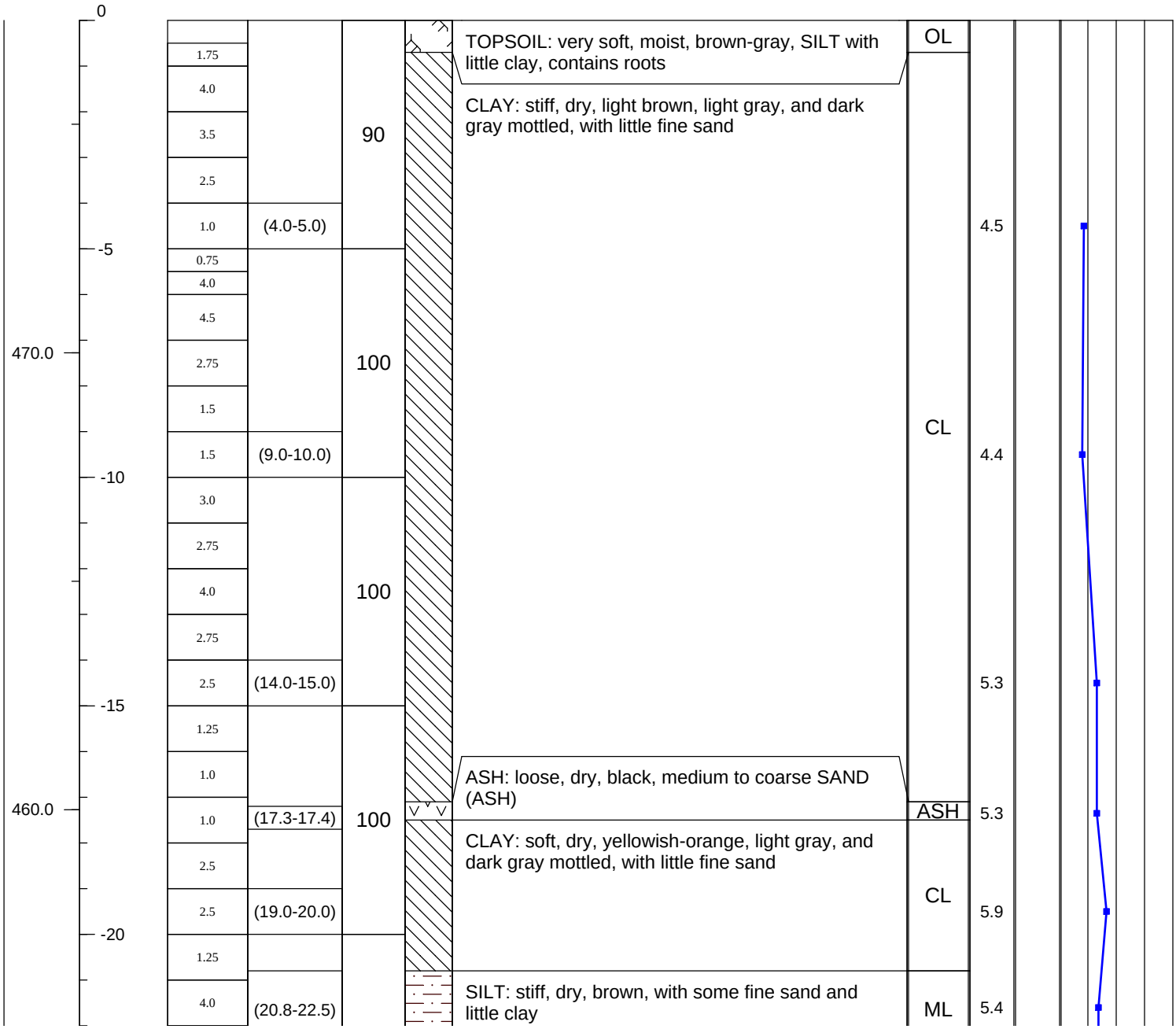
DATE BEGAN: 3/19/2015 | **DATE FINISHED:** 3/19/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams | **NORTH:** 699745.5996 | **EAST:** 1879365.017

GROUND SURFACE ELEVATION: 477.2747 | **BORING DEPTH:** 64.2' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling



NRS007 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS007

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS007 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/19/2015 **DATE FINISHED:** 3/19/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams **NORTH:** 699745.5996 **EAST:** 1879365.017

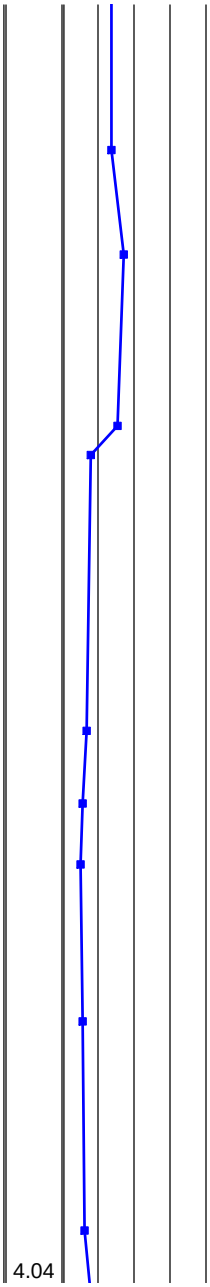
GROUND SURFACE ELEVATION: 477.2747 **BORING DEPTH:** 64.2' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
		3.0		97		CLAY: soft, dry, dark brown and gray mottled, with little fine sand	CL	5.4	
		1.0							
		0.75	(24.0-25.0)						
	-25	1.0						6.0	
		0.5	(26.1-26.5)						
450.0		4.0		93		SILT: stiff, dry, gray, with little clay, contains decayed organic material, leaves and roots	OL		
		4.5				SILT: light brown to gray, lacks organics above	ML		
		2.0	(29.0-29.5)					5.7	
	-30		(29.5-30.0)			CLAY: medium stiff, dry, light brown and light gray mottled, with little fine sand	CL	4.4	
		2.0							
		1.5							
		1.25		100		CLAYEY SILT: soft, moist, brown, with little fine sand	ML/CL		
		1.25							
		2.25	(34.0-35.0)			SAND: loose, moist, brown, fine grained, with little silt and clay	SP	4.2	
	-35	< 0.25							
			(35.5-36.0)			CLAYEY SILT: becomes more clay and silt rich	SM	4.0	
		< 0.25							
			(36.6-37.0)			SAND: loose, moist, brown, fine grained, with little silt and clay	SP	3.9	
440.0		0.5		100					
		0.25				SAND: becomes more clay and silt rich	SM		
		0.25							
		1.0	(39.0-40.0)			SAND: loose, moist, brown, fine grained, with little silt and clay, with frequent clay lenses (39'-40'), becomes wet at 40'	SP	4.0	
	-40	< 0.25							
		< 0.25							
		0.5		100					
		1.5	(42.6-43.6)			CLAY: medium stiff, moist, light brown and light gray mottled, with little sand, at 44.9' there is a 1/8" thick layer of peat		4.1	4.04

SOIL pH GRAPH *3 to 11 S.U.*



NRS007 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS007

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS007 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/19/2015 **DATE FINISHED:** 3/19/2015 **FIELD ENGINEER:** Joseph Kiker

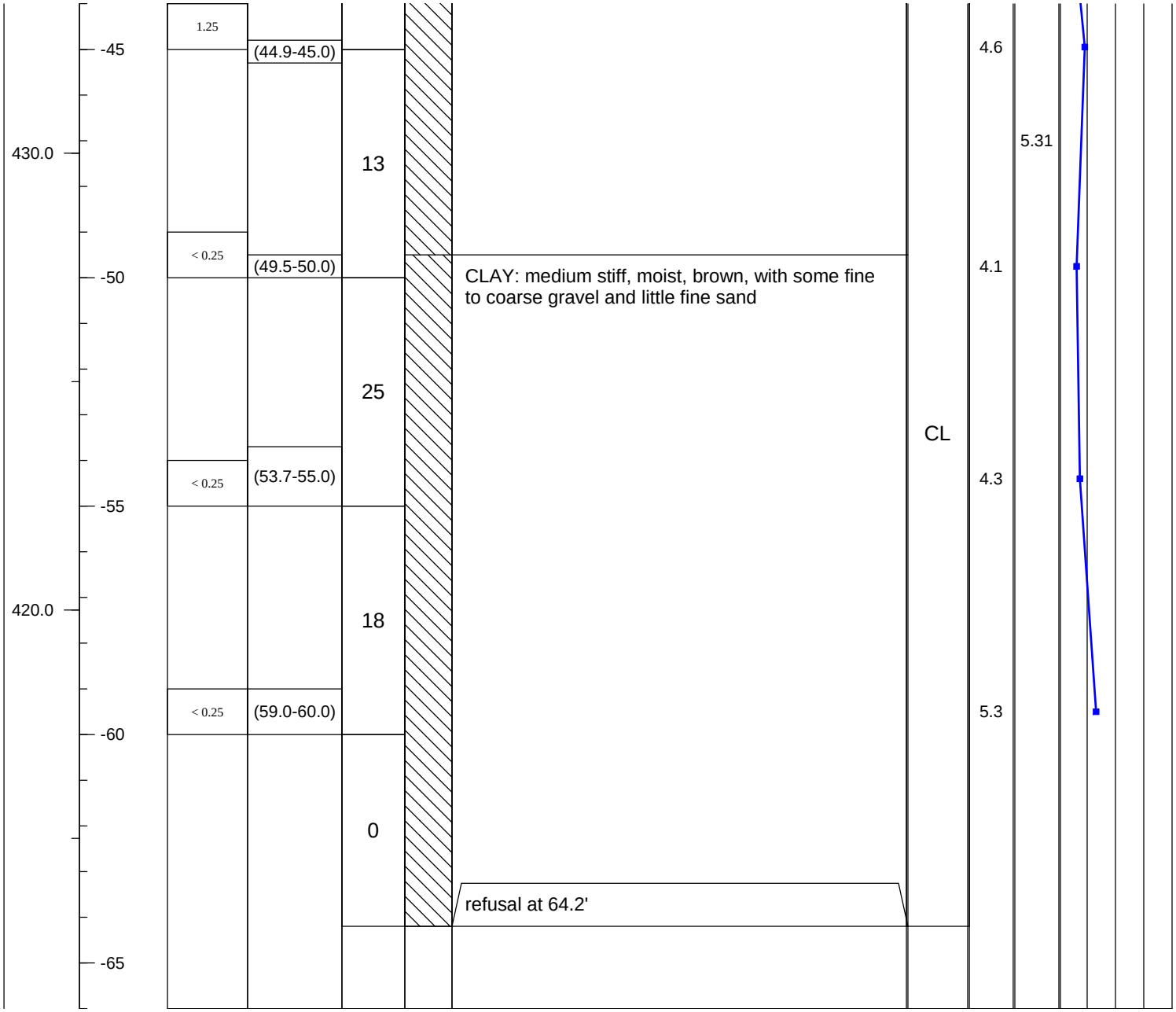
DRILLER: Tyler Williams **NORTH:** 699745.5996 **EAST:** 1879365.017

GROUND SURFACE ELEVATION: 477.2747 **BORING DEPTH:** 64.2' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
430.0	-45	1.25	(44.9-45.0)	13				4.6	5.31	
	-50	< 0.25	(49.5-50.0)	25		CLAY: medium stiff, moist, brown, with some fine to coarse gravel and little fine sand	CL	4.1		
420.0	-55	< 0.25	(53.7-55.0)	18				4.3		
	-60	< 0.25	(59.0-60.0)	0		refusal at 64.2'		5.3		
	-65									



NRS007 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS007

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS008 | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/24/2015 | **DATE FINISHED:** 3/24/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams | **NORTH:** 700370.0312 | **EAST:** 1880137.157

GROUND SURFACE ELEVATION: 503.9523 | **BORING DEPTH:** 91.2' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	DESCRIPTION	USCS	SOIL pH	WATER pH
503.9523	0	4.5	(0.0-0.4)	100	CLAYEY SILT: medium stiff, gray-brown, with little gravel, pieces of coal from 1' to 3' (FILL)	ML/CL	7.5	
		4.5	(1.0-2.0)		SILTY CLAY: stiff, brown		7.0	
		0.75						
		0.75			SILTY CLAY: black, with fine to coarse gravel		7.5	
		2.0	(2.4-3.0)				7.6	
		4.0	(3.0-3.7)					
500.0		1.75			SILTY CLAY: loose, dry, with some fine sand and fine to coarse gravel		7.9	
	-5	< 0.25	(4.0-5.0)			CL/ML		
		< 0.25		80				
		< 0.25						
		< 0.25						
		< 0.25			SILTY CLAY: yellow-brown to gray-black to yellow-brown			
		< 0.25	(8.5-9.2)				4.1	
		0.25	(9.4-9.6)				4.4	
	-10		(9.6-10.0)		ASH: loose, dry, black, fine to coarse GRAVEL with some fine sand (ASH)		4.5	
					ASH: soft, moist, gray, SILT			
		0.5		76	ASH: loose, dry, brown-gray, SILT with some fine sand			
		< 0.25						
		< 0.25			ASH: soft, moist, gray, SILT			
490.0		0.25	(13.5-14.2)				7.0	
		< 0.25	(14.2-15.0)		ASH: loose, dry, black, fine sand, with some SILT and little fine to medium gravel		7.5	
	-15				ASH: soft, wet, gray, SILT			
		1.5			ASH: loose, wet, black, fine SAND, with some silt and little fine to medium gravel			
		1.5		70				
		0.25			ASH: soft, wet, gray, SILT			
		0.25						
		1.5	(19.0-20.0)		ASH: loose, wet, black, fine SAND, with some silt and little fine to medium gravel		7.3	
		0.25						
	-20	1.5			ASH: soft, wet, gray, SILT			
		0.25			ASH: loose, wet, black, fine SAND, with some silt and little fine to medium gravel	ASH		

SOIL pH GRAPH (3 to 11 S.U.)

NRS008 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS008

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS008 | **PROJECT NAME:** TVA GAF NRS

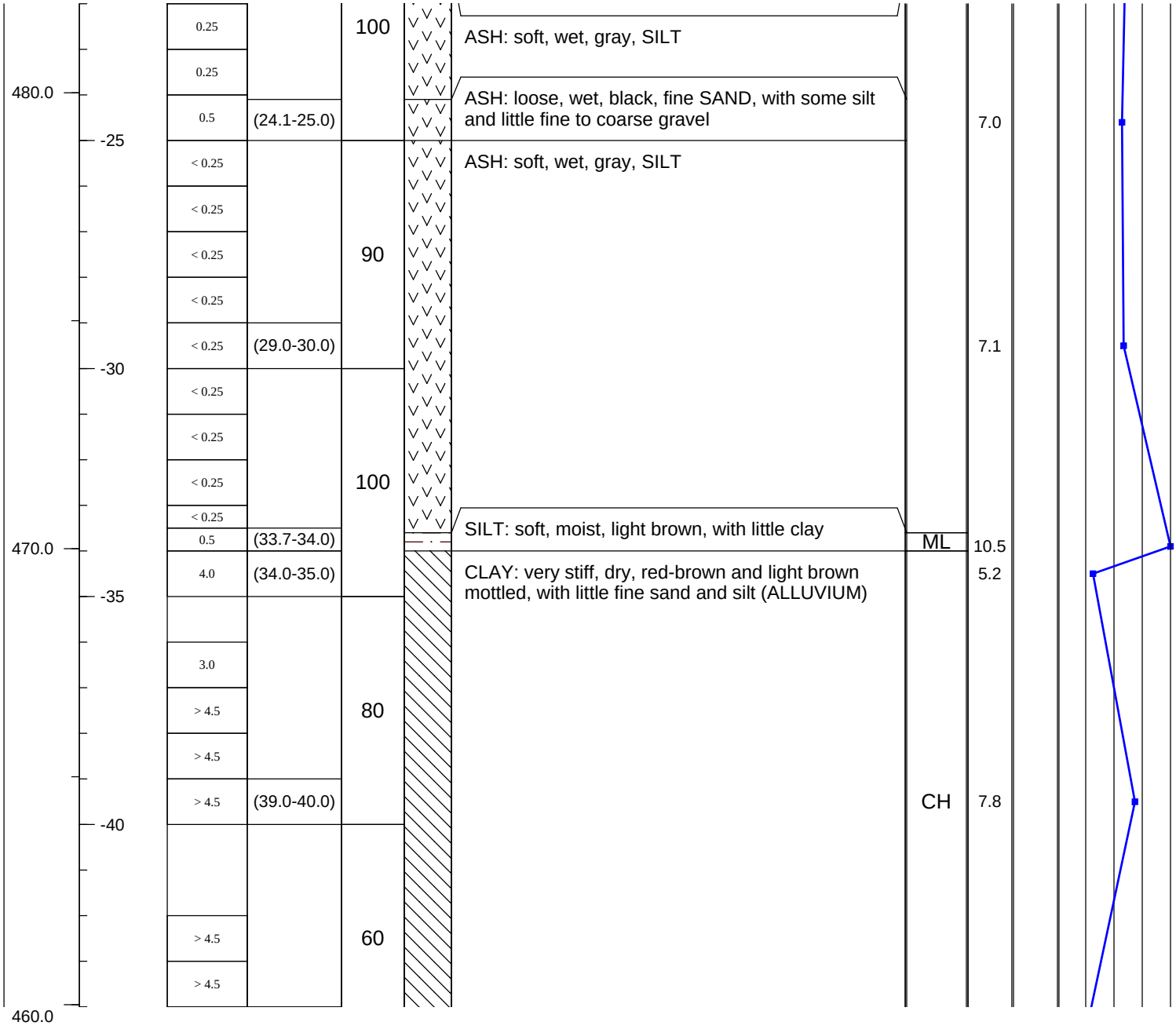
DATE BEGAN: 3/24/2015 | **DATE FINISHED:** 3/24/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams | **NORTH:** 700370.0312 | **EAST:** 1880137.157

GROUND SURFACE ELEVATION: 503.9523 | **BORING DEPTH:** 91.2' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling



URS	NRS008 Boring Log TVA Gallatin Non-Registered Site 1499 Steam Plant Rd., Gallatin, TN 37066 Sumner Co., Tennessee	DRAWN BY: JMK	CHECKED BY: AC	PROJECT NO: 31853391
PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT		SHEET: NRS008		

URS SOIL BORING LOG

PROJECT NO: 31853391
BORING NO: NRS008
PROJECT NAME: TVA GAF NRS
DATE BEGAN: 3/24/2015
DATE FINISHED: 3/24/2015
FIELD ENGINEER: Joseph Kiker
DRILLER: Tyler Williams
NORTH: 700370.0312
EAST: 1880137.157
GROUND SURFACE ELEVATION: 503.9523
BORING DEPTH: 91.2'
BORING DIAMETER: 2.25"
DRILLING METHOD: Direct Push Technology
DRILL EQUIP: Geoprobe 7822DT
CHECKED BY: AECOM
CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
460.0	-45	> 4.5	(44.0-45.0)	0				4.8		
	-50			0						
450.0	-55			0		Note: stopped collecting samples at 60' due to poor recovery. Pushed expendable point to refusal depth of 91.2'.				
	-60									
440.0	-65									

NRS008 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK
CHECKED BY: AC
PROJECT NO: 31853391
SHEET: NRS008

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS009 | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/26/2015 | **DATE FINISHED:** 3/26/2015 | **FIELD ENGINEER:** Corey Scheip

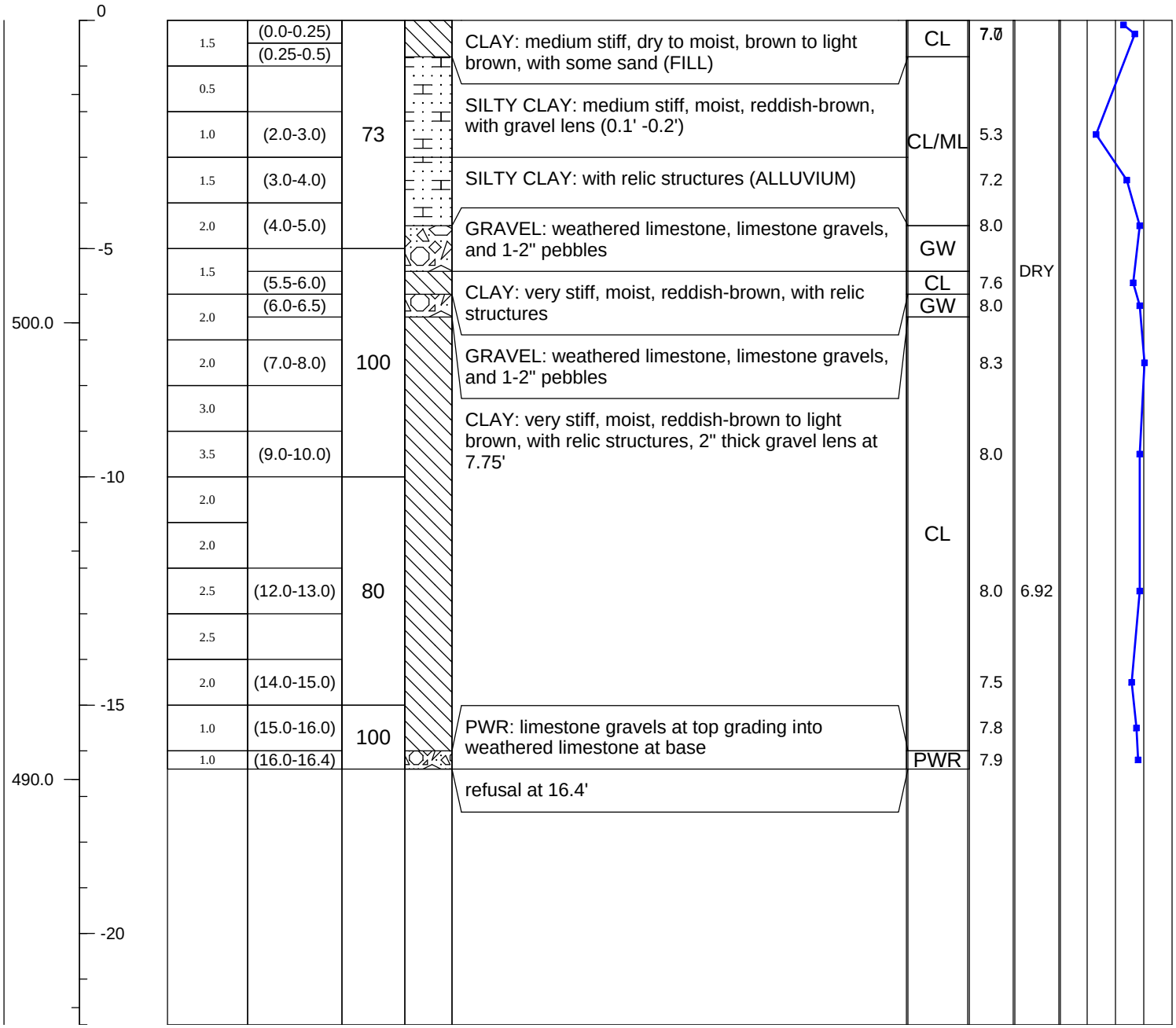
DRILLER: Tyler Williams | **NORTH:** 700760.4249 | **EAST:** 1880519.839

GROUND SURFACE ELEVATION: 506.6256 | **BORING DEPTH:** 16.4' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH 3 *to 11 S.U.*
	0	1.5	(0.0-0.25)			CLAY: medium stiff, dry to moist, brown to light brown, with some sand (FILL)	CL	7.0		
			(0.25-0.5)							
		0.5				SILTY CLAY: medium stiff, moist, reddish-brown, with gravel lens (0.1' -0.2')	CL/ML	5.3		
		1.0	(2.0-3.0)	73						
		1.5	(3.0-4.0)			SILTY CLAY: with relic structures (ALLUVIUM)		7.2		
		2.0	(4.0-5.0)			GRAVEL: weathered limestone, limestone gravels, and 1-2" pebbles	GW	8.0		
	-5	1.5								
			(5.5-6.0)			CLAY: very stiff, moist, reddish-brown, with relic structures	CL	7.6	DRY	
500.0		2.0	(6.0-6.5)				GW	8.0		
		2.0	(7.0-8.0)	100		GRAVEL: weathered limestone, limestone gravels, and 1-2" pebbles		8.3		
		3.0								
		3.5	(9.0-10.0)			CLAY: very stiff, moist, reddish-brown to light brown, with relic structures, 2" thick gravel lens at 7.75'		8.0		
	-10	2.0					CL			
		2.0								
		2.5	(12.0-13.0)	80				8.0	6.92	
		2.5								
		2.0	(14.0-15.0)					7.5		
	-15	1.0	(15.0-16.0)	100		PWR: limestone gravels at top grading into weathered limestone at base		7.8		
		1.0	(16.0-16.4)				PWR	7.9		
490.0						refusal at 16.4'				
	-20									



NRS009 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS009

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS010 | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/26/2015 | **DATE FINISHED:** 3/26/2015 | **FIELD ENGINEER:** Corey Scheip

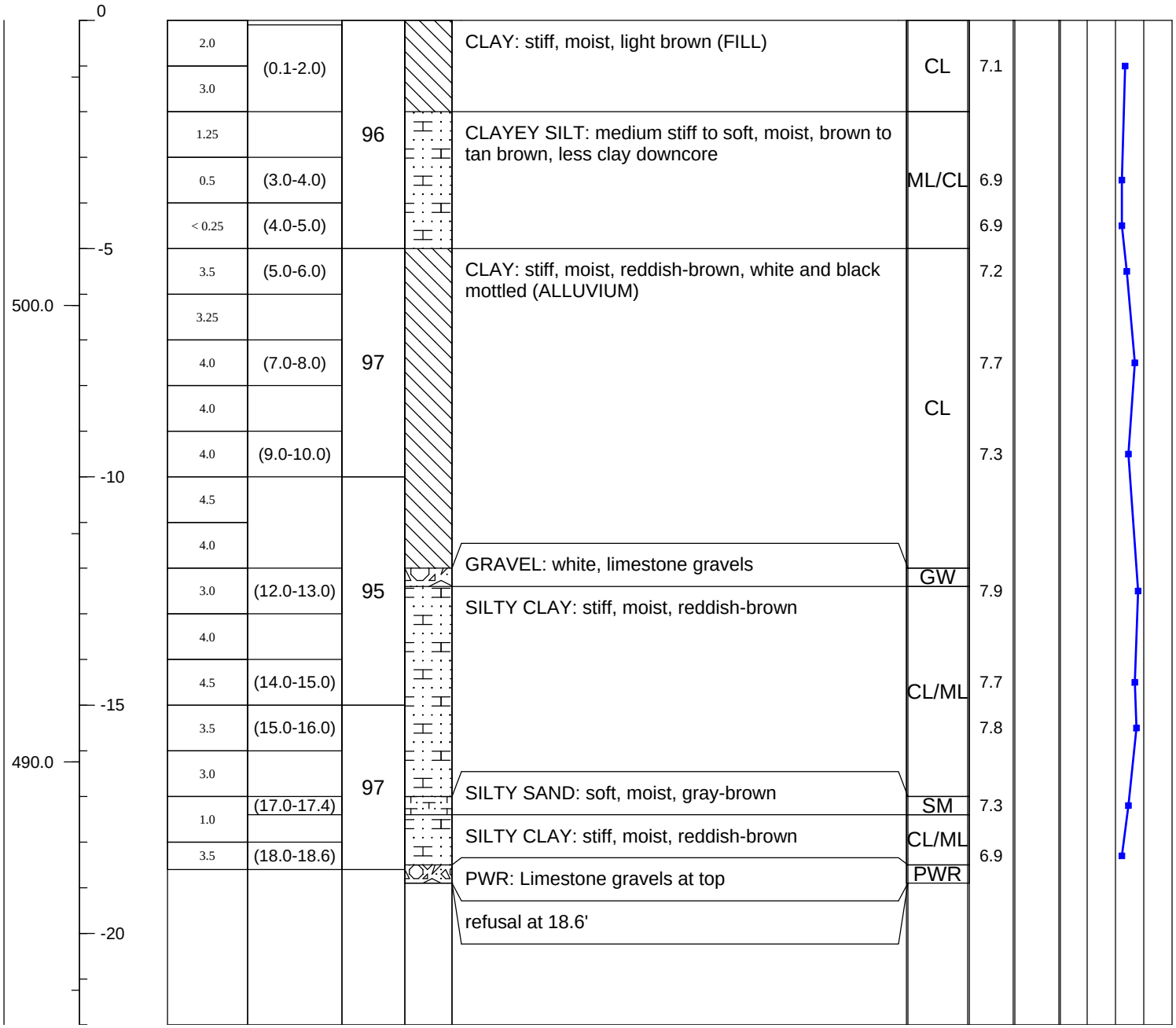
DRILLER: Tyler Williams | **NORTH:** 700751.7453 | **EAST:** 1880613.131

GROUND SURFACE ELEVATION: 506.2447 | **BORING DEPTH:** 18.6' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0	2.0	(0.1-2.0)	96		CLAY: stiff, moist, light brown (FILL)	CL	7.1		
		3.0								
		1.25				CLAYEY SILT: medium stiff to soft, moist, brown to tan brown, less clay downcore	ML/CL	6.9		
		0.5	(3.0-4.0)							
		< 0.25	(4.0-5.0)					6.9		
	-5	3.5	(5.0-6.0)	97		CLAY: stiff, moist, reddish-brown, white and black mottled (ALLUVIUM)	CL	7.2		
500.0		3.25								
		4.0	(7.0-8.0)					7.7		
		4.0								
		4.0	(9.0-10.0)					7.3		
	-10	4.5		95						
		4.0				GRAVEL: white, limestone gravels	GW			
		3.0	(12.0-13.0)			SILTY CLAY: stiff, moist, reddish-brown		7.9		
		4.0								
		4.5	(14.0-15.0)				CL/ML	7.7		
	-15	3.5	(15.0-16.0)					7.8		
490.0		3.0		97		SILTY SAND: soft, moist, gray-brown	SM	7.3		
		1.0	(17.0-17.4)			SILTY CLAY: stiff, moist, reddish-brown	CL/ML			
		3.5	(18.0-18.6)					6.9		
						PWR: Limestone gravels at top	PWR			
	-20					refusal at 18.6'				



NRS010 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS010

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS011 | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/26/2015 | **DATE FINISHED:** 3/26/2015 | **FIELD ENGINEER:** Joseph Kiker

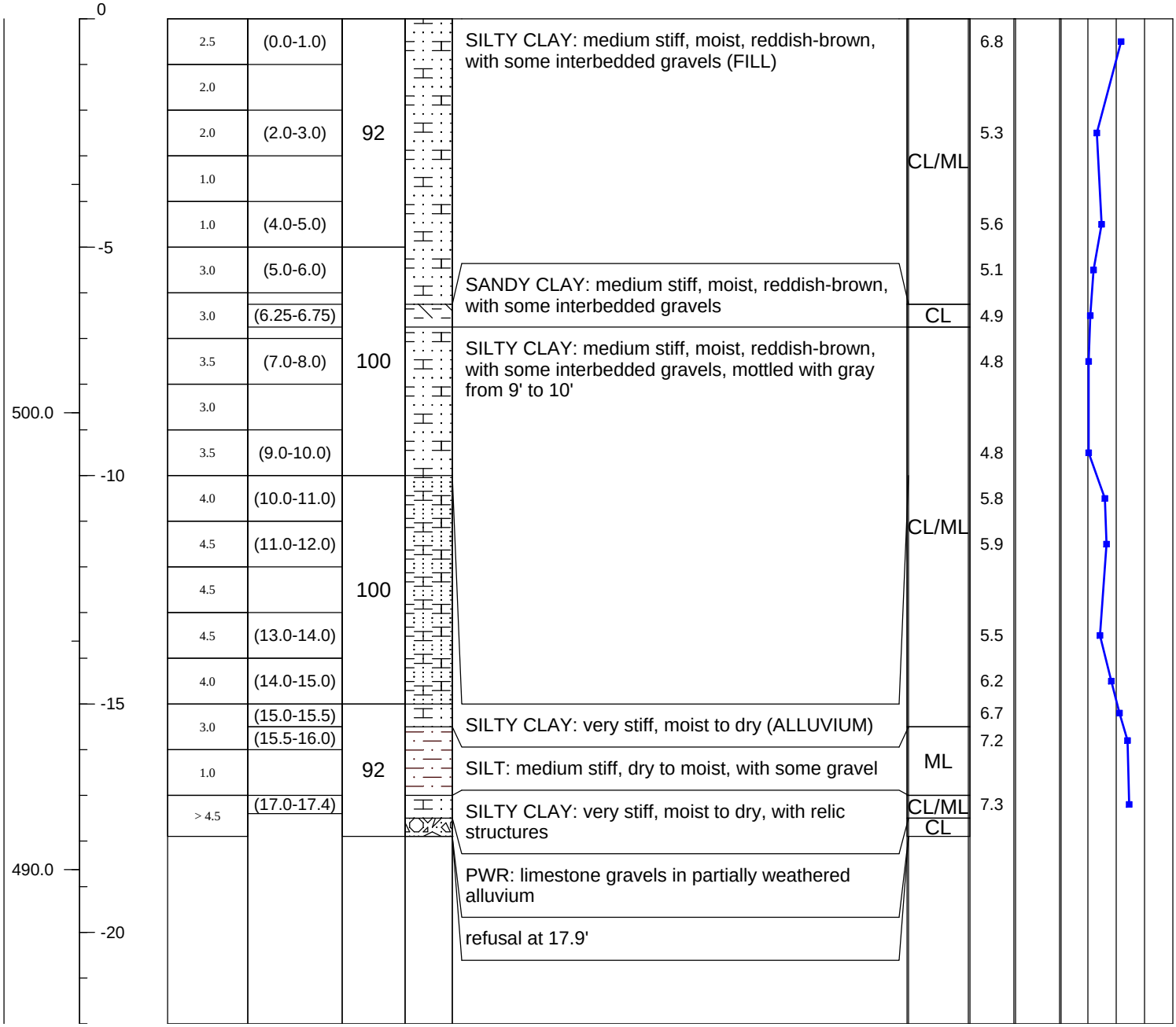
DRILLER: Tyler Williams | **NORTH:** 700758.6218 | **EAST:** 1880705.389

GROUND SURFACE ELEVATION: 508.6248 | **BORING DEPTH:** 17.9' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH 3 to 11 S.U.
508.6	0	2.5	(0.0-1.0)	92		SILTY CLAY: medium stiff, moist, reddish-brown, with some interbedded gravels (FILL)	CL/ML	6.8		
		2.0								
		2.0	(2.0-3.0)					5.3		
		1.0								
		1.0	(4.0-5.0)					5.6		
	-5	3.0	(5.0-6.0)	100		SANDY CLAY: medium stiff, moist, reddish-brown, with some interbedded gravels		5.1		
		3.0	(6.25-6.75)				CL	4.9		
		3.5	(7.0-8.0)			SILTY CLAY: medium stiff, moist, reddish-brown, with some interbedded gravels, mottled with gray from 9' to 10'	CL/ML	4.8		
500.0		3.0								
		3.5	(9.0-10.0)					4.8		
	-10	4.0	(10.0-11.0)	100				5.8		
		4.5	(11.0-12.0)					5.9		
		4.5								
		4.5	(13.0-14.0)					5.5		
		4.0	(14.0-15.0)					6.2		
	-15	3.0	(15.0-15.5)	92		SILTY CLAY: very stiff, moist to dry (ALLUVIUM)		6.7		
			(15.5-16.0)					7.2		
		1.0				SILT: medium stiff, dry to moist, with some gravel	ML			
		> 4.5	(17.0-17.4)			SILTY CLAY: very stiff, moist to dry, with relic structures	CL/ML	7.3		
490.0							CL			
	-20					PWR: limestone gravels in partially weathered alluvium				
						refusal at 17.9'				



URS

NRS011 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS011

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS012 | **PROJECT NAME:** TVA GAF NRS

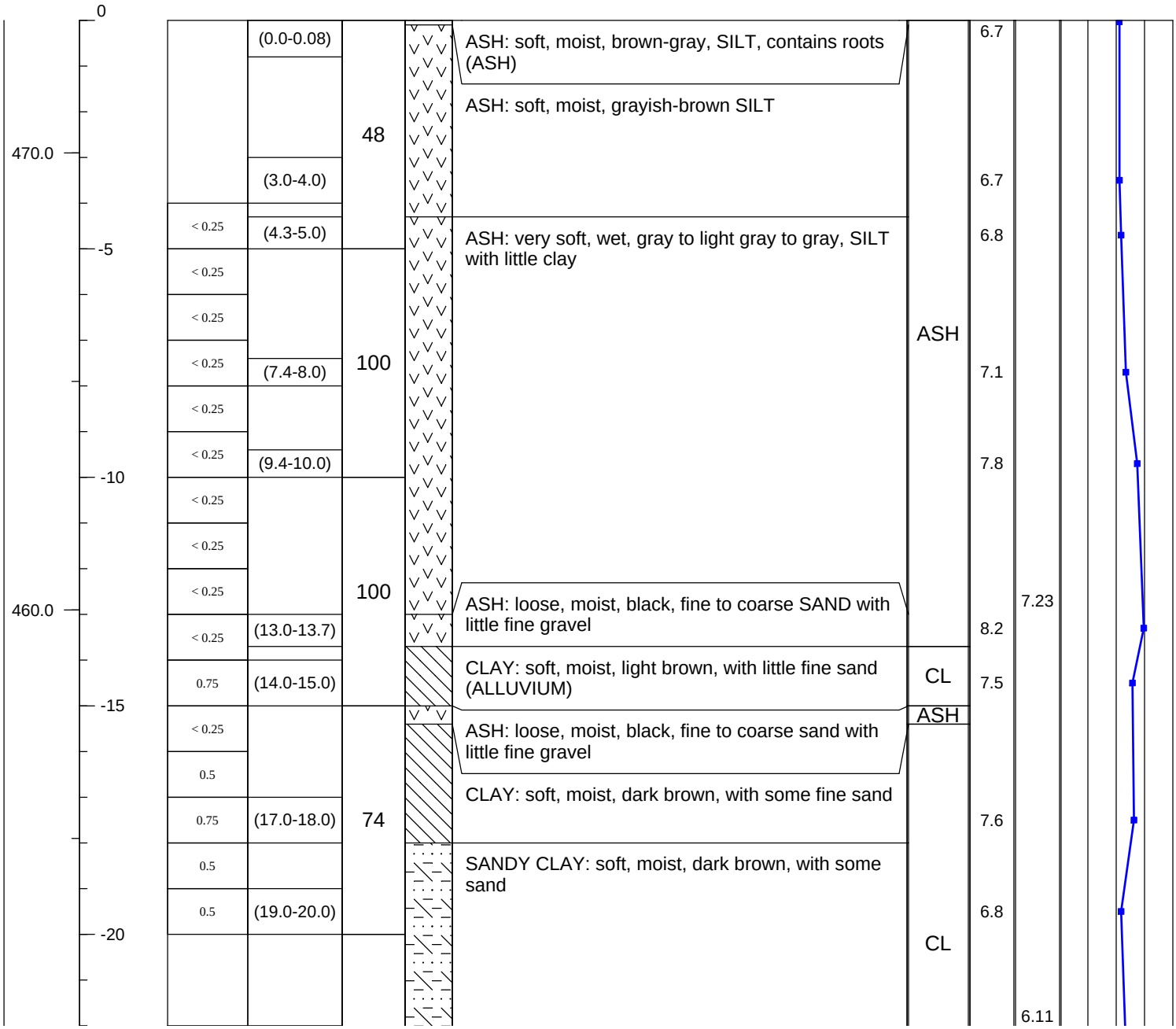
DATE BEGAN: 4/2/2015 | **DATE FINISHED:** 4/2/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams | **NORTH:** 699847.2216 | **EAST:** 1879531.36

GROUND SURFACE ELEVATION: 472.9016 | **BORING DEPTH:** 25.0' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling



NRS012 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS012

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS012 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 4/2/2015 **DATE FINISHED:** 4/2/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Tyler Williams **NORTH:** 699847.2216 **EAST:** 1879531.36

GROUND SURFACE ELEVATION: 472.9016 **BORING DEPTH:** 25.0' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	COMPRESSIVE SOIL STRENGTH (tons per sq. ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
450.0		< 0.25	(22.0-23.0)	70				7.1		
		1.0				SANDY CLAY: light gray, dark brown, and light brown mottled				
	-25	1.5	(24.0-25.0)			Note: Did not drill to refusal but to a target depth of 25'		4.9		
	-30									
440.0										
	-35									
	-40									
430.0										

NRS012 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS012

URS SOIL BORING LOG

PROJECT NO: 31853391 | **BORING NO:** NRS013 | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/31/2015 | **DATE FINISHED:** 4/1/2015 | **FIELD ENGINEER:** Craig Bernhoft

DRILLER: Fred Reynolds | **NORTH:** 700195.6203 | **EAST:** 1880278.05

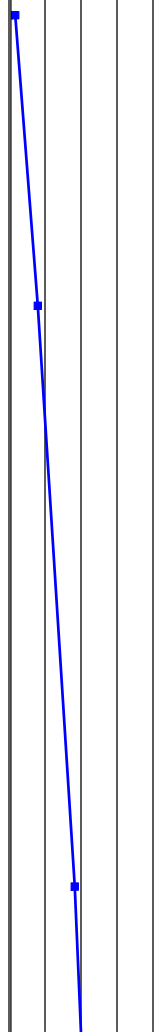
GROUND SURFACE ELEVATION: 504.7322 | **BORING DEPTH:** 76.2' | **BORING DIAMETER:** 7.5"

DRILLING METHOD: Hollow Stem Auger | **DRILL EQUIP:** CME-55 | **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	DESCRIPTION	USCS	SOIL pH	WATER pH
500.0	0	22/38/30/49	(4.0-5.0)	100	FILL: firm, dry, dark brown, SILT and medium to coarse GRAVEL (FILL)	FILL	3.3	
	-5							
	-10	10/13/11/11	(9.0-10.0)	100	ASH: dry, loose, black and little dark brown, coarse SAND with pebbles (ASH)		4.4	
490.0	-15	5/5/4/3	(19.0-20.0)	80	ASH: loose, wet, coarse SAND ASH: increase in fines	ASH	6.2	
	-20							

SOIL pH GRAPH *3 to 11 S.U.*



URS	NRS013 Boring Log TVA Gallatin Non-Registered Site 1499 Steam Plant Rd., Gallatin, TN 37066 Sumner Co., Tennessee	DRAWN BY: JMK	CHECKED BY: AC	PROJECT NO: 31853391
PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT		SHEET: NRS013		

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS013 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/31/2015 **DATE FINISHED:** 4/1/2015 **FIELD ENGINEER:** Craig Bernhoft

DRILLER: Fred Reynolds **NORTH:** 700195.6203 **EAST:** 1880278.05

GROUND SURFACE ELEVATION: 504.7322 **BORING DEPTH:** 76.2' **BORING DIAMETER:** 7.5"

DRILLING METHOD: Hollow Stem Auger **DRILL EQUIP:** CME-55 **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
480.0	-25									
		2/2/3/5	(29.0-30.0)	100		ASH: soft to firm, wet, black with slight gray, SAND with fines		7.4		
	-30									
		0/3/5/7	(33.5-33.8)	95		ASH: loose, dry, orange brown to dark gray, SAND		8.3		
			(33.8-34.8)			SILTY CLAY: firm, dry, brown and orange mottled (ALLUVIUM)		8.4		
470.0	-35									
	-40									
		4/7/9/10		100		CLAY: soft to stiff, dry, brown to dark tan, silty, low plasticity				

URS

NRS013 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS013

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS013 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/31/2015 **DATE FINISHED:** 4/1/2015 **FIELD ENGINEER:** Craig Bernhoft

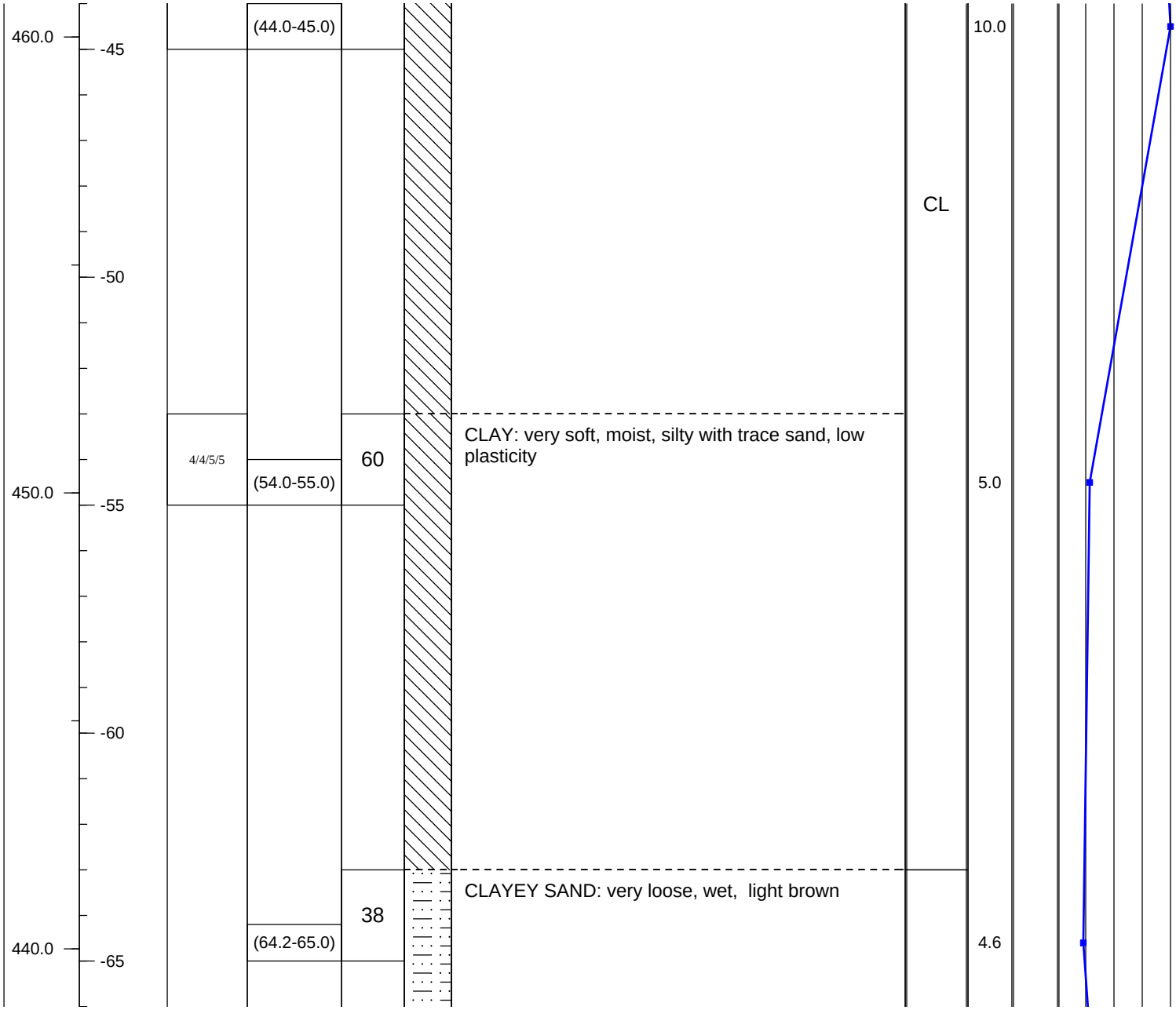
DRILLER: Fred Reynolds **NORTH:** 700195.6203 **EAST:** 1880278.05

GROUND SURFACE ELEVATION: 504.7322 **BORING DEPTH:** 76.2' **BORING DIAMETER:** 7.5"

DRILLING METHOD: Hollow Stem Auger **DRILL EQUIP:** CME-55 **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
460.0	-45		(44.0-45.0)					10.0		
	-50	4/4/5/5	(54.0-55.0)	60		CLAY: very soft, moist, silty with trace sand, low plasticity	CL			
450.0	-55							5.0		
	-60			38		CLAYEY SAND: very loose, wet, light brown				
440.0	-65		(64.2-65.0)					4.6		



NRS013 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS013

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS013 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 3/31/2015 **DATE FINISHED:** 4/1/2015 **FIELD ENGINEER:** Craig Bernhoft

DRILLER: Fred Reynolds **NORTH:** 700195.6203 **EAST:** 1880278.05

GROUND SURFACE ELEVATION: 504.7322 **BORING DEPTH:** 76.2' **BORING DIAMETER:** 7.5"

DRILLING METHOD: Hollow Stem Auger **DRILL EQUIP:** CME-55 **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-70						SC			
		0/12/6/4	(74.0-75.0)	100		CLAY: firm to stiff, dry, dark brown to tan, high plasticity	CH			
						PWR: wet, cherty rock layer	PWR			
430.0	-75	> 50		0		CLAY: little silt, high plasticity	CH	6.6		
						refusal at 76.2'				
	-80									
420.0	-85									

NRS013 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS013

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS014 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 4/1/2015 **DATE FINISHED:** 4/1/2015 **FIELD ENGINEER:** Craig Bernhoft

DRILLER: Fred Reynolds **NORTH:** 700104.3659 **EAST:** 1880321.36

GROUND SURFACE ELEVATION: 504.9161 **BORING DEPTH:** 43.0' **BORING DIAMETER:** 7.5"

DRILLING METHOD: Hollow Stem Auger **DRILL EQUIP:** CME-55 **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0									
		3/10/ 50/5	(3.0-4.0)	50		FILL: loose, dry, SILT, SAND, with rock fragments (FILL)	FILL	5.7		
500.0	-5	44/44/ 50/5	(6.0-7.0)	65				7.8		
		11/7/6/13	(8.0-9.0)	65		FILL: larger rock fragments		5.2		
	-10	11/14/15/13	(10.0-11.0)	90		ASH: firm, dry, black, coarse SAND, with some fines (ASH)	ASH	5.2		
			(12.0-13.0)					4.8		
490.0	-15	4/5/5/3		100		ASH: firm, dry, black, fine SAND, with some fines				
	-20									

NRS014 Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: JMK | CHECKED BY: AC | PROJECT NO: 31853391

PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT

SHEET: NRS014

URS SOIL BORING LOG

PROJECT NO: 31853391 **BORING NO:** NRS014 **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 4/1/2015 **DATE FINISHED:** 4/1/2015 **FIELD ENGINEER:** Craig Bernhoft

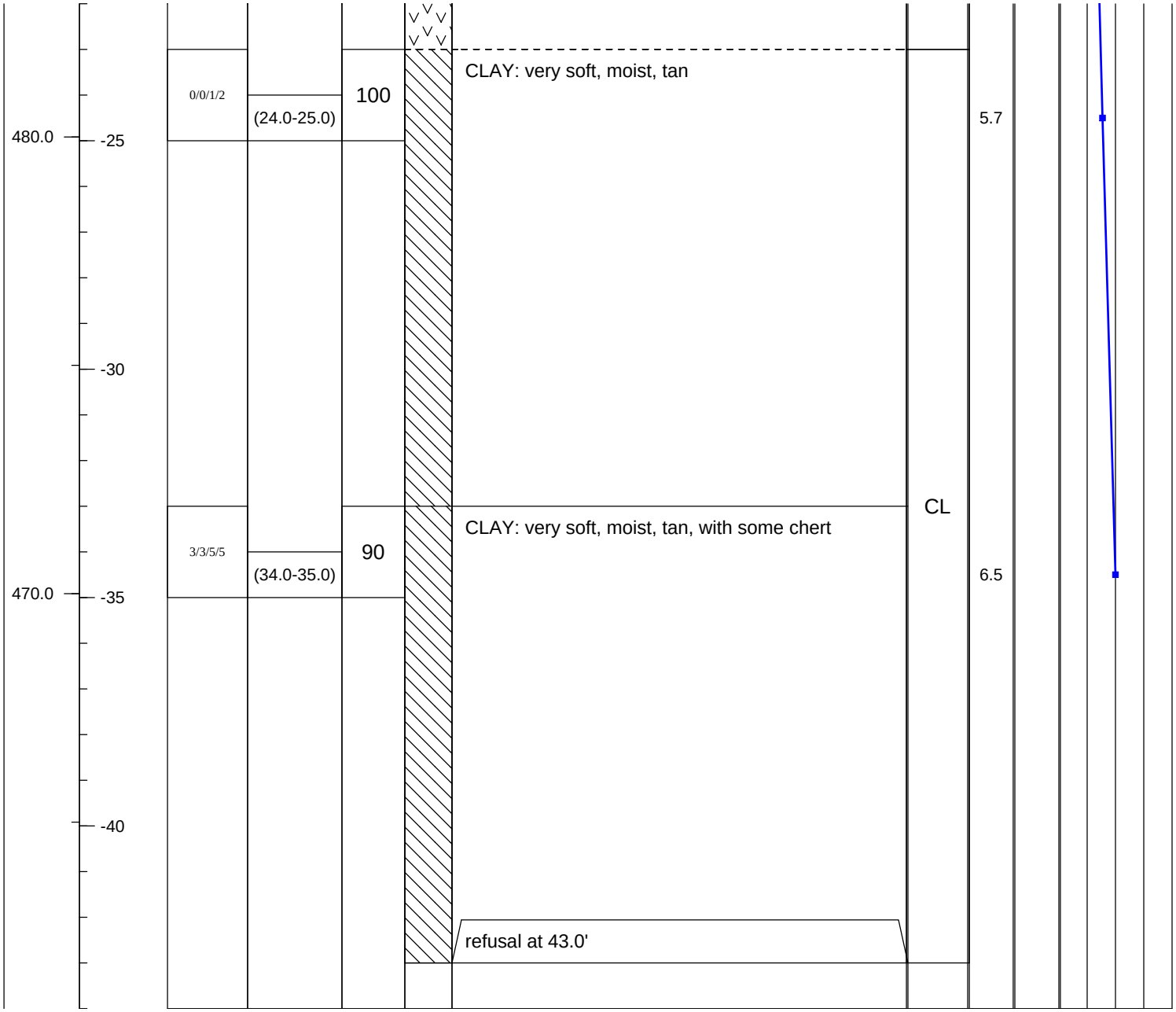
DRILLER: Fred Reynolds **NORTH:** 700104.3659 **EAST:** 1880321.36

GROUND SURFACE ELEVATION: 504.9161 **BORING DEPTH:** 43.0' **BORING DIAMETER:** 7.5"

DRILLING METHOD: Hollow Stem Auger **DRILL EQUIP:** CME-55 **CHECKED BY:** AECOM

CONTRACTOR: Tri-State Drilling

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
480.0	-25	0/0/1/2	(24.0-25.0)	100		CLAY: very soft, moist, tan	CL	5.7		
470.0	-35	3/3/5/5	(34.0-35.0)	90		CLAY: very soft, moist, tan, with some chert		6.5		
	-40					refusal at 43.0'				



URS	NRS014 Boring Log TVA Gallatin Non-Registered Site 1499 Steam Plant Rd., Gallatin, TN 37066 Sumner Co., Tennessee	DRAWN BY: JMK CHECKED BY: AC PROJECT NO: 31853391	
PREPARED AT REQUEST OF TVA GENERAL COUNSEL – ATTORNEY-CLIENT WORK PRODUCT		SHEET: NRS014	

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS001S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/7/2015 | **DATE FINISHED:** 7/7/2015 | **FIELD ENGINEER:** David Carlone

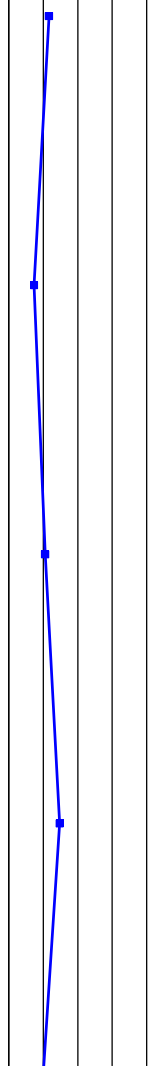
DRILLER: Mickey Ritter | **NORTH:** 699634.62 | **EAST:** 1879433.55

GROUND SURFACE ELEVATION: 476.80 | **BORING DEPTH:** 58' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
	0	(0-5)	40		CLAY: stiff, dark red-brown, with some fine gravel (~0.5" diameter), spots of discoloration at 5 ft bgs		5.04	
	-5							
470.0		(5-10)	80		CLAY: soft, red to yellow, with zone of angular limestone fragments (~1" diameter) at 9 ft bgs, becomes stiff at 10 ft bgs	CL	4.29	
	-10							
		(10-15)	100				4.85	
	-15				CLAY: stiff, red-brown, black carbon staining between 15 and 15.5 ft bgs, becomes soft and wet at 26 ft bgs			
460.0		(15-20)	100				5.58	
	-20							



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NRS001S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS001S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/7/2015 **DATE FINISHED:** 7/7/2015 **FIELD ENGINEER:** David Carlone

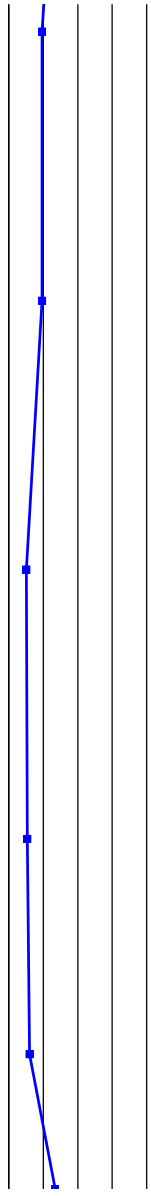
DRILLER: Mickey Ritter **NORTH:** 699634.62 **EAST:** 1879433.55

GROUND SURFACE ELEVATION: 476.80 **BORING DEPTH:** 58' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
		(20-25)	100			CL	4.68		
	-25	(25-30)	100				4.68		
450.0	-30	(30-35)	100		CLAYEY SILT: wet, red-brown, sub-rounded limestone gravel (~0.5" diameter)	ML	3.90		
	-35	(35-40)	80		SANDY CLAY: wet, red-yellow, with coarse sub-angular gravel, black staining at 40 ft bgs	CL	3.94		
440.0	-40	(40-43)	100				4.06		
		(43-45)			CLAY: red-brown, with coarse sub-angular gravel, with a zone of wet sub-angular gravel between 44 and 45 ft bgs		5.36		



SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS001S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/7/2015 | **DATE FINISHED:** 7/7/2015 | **FIELD ENGINEER:** David Carlone

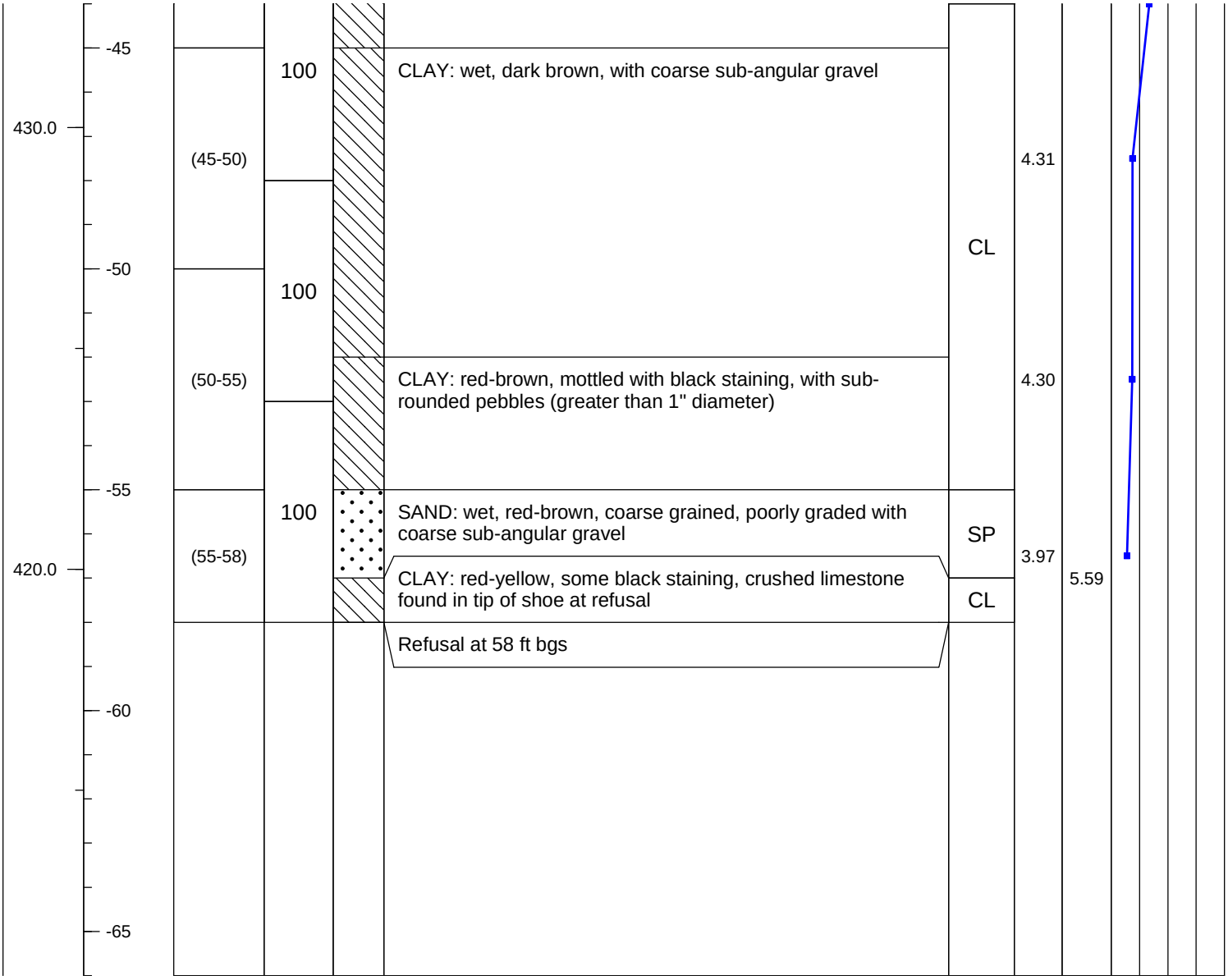
DRILLER: Mickey Ritter | **NORTH:** 699634.62 | **EAST:** 1879433.55

GROUND SURFACE ELEVATION: 476.80 | **BORING DEPTH:** 58' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
430.0	-45	(45-50)	100		CLAY: wet, dark brown, with coarse sub-angular gravel	CL	4.31		
	-50	(50-55)	100		CLAY: red-brown, mottled with black staining, with sub-rounded pebbles (greater than 1" diameter)		4.30		
420.0	-55	(55-58)	100		SAND: wet, red-brown, coarse grained, poorly graded with coarse sub-angular gravel	SP	3.97	5.59	
					CLAY: red-yellow, some black staining, crushed limestone found in tip of shoe at refusal	CL			
	-60				Refusal at 58 ft bgs				
	-65								



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NRS001S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS002S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 | **DATE FINISHED:** 7/8/2015 | **FIELD ENGINEER:** David Carlone

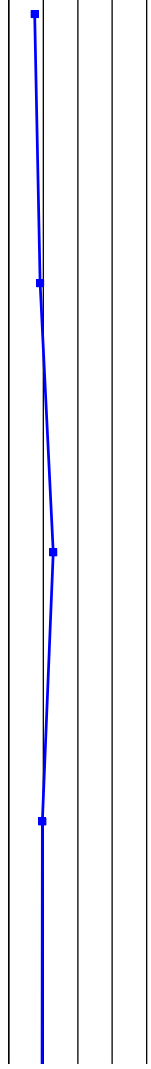
DRILLER: Mickey Ritter | **NORTH:** 699893.49 | **EAST:** 1879280.70

GROUND SURFACE ELEVATION: 476.32 | **BORING DEPTH:** 56.5' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0	(0-5)	33		LIGNITE	FILL	4.32		
					CLAY: stiff, red-brown, some black discoloration, with a 4" zone of angular gravel-sized coal fragments at 7 ft bgs				
	-5	(5-10)	80				4.59		
470.0									
	-10	(10-15)	80		CLAY: stiff, red-brown, with coarse sub-rounded gravel, becomes soft at 16 ft bgs	CL	5.26		
	-15	(15-20)	80				4.70		
460.0									
	-20		90						



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NRS002S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS002S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 | **DATE FINISHED:** 7/8/2015 | **FIELD ENGINEER:** David Carlone

DRILLER: Mickey Ritter | **NORTH:** 699893.49 | **EAST:** 1879280.70

GROUND SURFACE ELEVATION: 476.32 | **BORING DEPTH:** 56.5' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
		(20-25)			CLAY: very soft, wet, red-brown		4.69		
	-25		80		CLAY: soft, red-brown, with coarse sub-rounded limestone gravel				
450.0		(25-28)			CLAY: stiff, red-brown, with coarse sub-rounded limestone gravel		4.53		
	-30	(28-33)	100		CLAY: very soft, red brown, becomes stiff at 29 ft bgs, with a 6" zone of black staining at 31 ft bgs	CL	5.28		
	-35	(33-38)	100		CLAY: stiff, brown, becomes very soft at 35 ft bgs		5.18		
440.0					SILTY CLAY: very soft, red-brown				
	-40	(38-43)	90		SILTY CLAY: stiff, red-yellow, mottled, with some pebbles (0.5" to 1" in diameter)		5.00		
					SILTY CLAY: stiff, red-brown, some black staining, with sub-angular sand and coarse gravel (greater than 1" in diameter)				

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS002S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 **DATE FINISHED:** 7/8/2015 **FIELD ENGINEER:** David Carlone

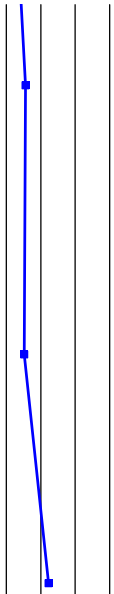
DRILLER: Mickey Ritter **NORTH:** 699893.49 **EAST:** 1879280.70

GROUND SURFACE ELEVATION: 476.32 **BORING DEPTH:** 56.5' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
430.0	-45	(43-48)	100		GRAVELLY CLAY: stiff, red-brown, with some large angular pieces of chert and limestone, with a 4-6" zone of black staining at 52 ft bgs	CL	5.72	7.09	
	-50	(48-53)	100				5.67		
	-55	(53-56.5)	100		GRAVELLY CLAY: stiff, wet, red-brown mottled with black staining, some limestone and chert pebbles (0.5-1" in diameter), moisture most likely from rain		6.89		
420.0					Refusal at 56.5 ft bgs				
	-60								
	-65								



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NRS002S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS002SA **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/24/2015 **DATE FINISHED:** 7/24/2015 **FIELD ENGINEER:** Edward Eastham

DRILLER: Levi Mainard **NORTH:** 699890.38 **EAST:** 1879280.58

GROUND SURFACE ELEVATION: 476.55 **BORING DEPTH:** 59' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0					CLAY: firm, orange, with some mottling, has organic odor, becomes moist at 14 ft bgs	CL			
	-5	3/4/4/5		100						
470.0										
	-10	4/5/7/10		100						
	-15	3/3/2/4		100						
460.0										
	-20	6/6/6/7		100		CLAY: becomes more sandy				

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NRS002SA Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS002SA **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/24/2015 **DATE FINISHED:** 7/24/2015 **FIELD ENGINEER:** Edward Eastham

DRILLER: Levi Mainard **NORTH:** 699890.38 **EAST:** 1879280.58

GROUND SURFACE ELEVATION: 476.55 **BORING DEPTH:** 59' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
						FAT CLAY: moist, gray, contains roots and organics	CL			
							CH			
	-25	3/4/8/9		100		SANDY CLAY: firm, orange, displays some plasticity				
450.0							CL			
						FAT CLAY: soft to firm, moist, brown, contains organics	CH			
	-30	4/5/7/7		100		CLAY: firm, dry, orange				
	-35	4/4/6/5		100		CLAY: moist, gray to tan, has organic odor				
440.0							CL			
	-40	5/5/7/7		100		CLAY: firm, dry, orange and tan				

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS002SA | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/24/2015 | **DATE FINISHED:** 7/24/2015 | **FIELD ENGINEER:** Edward Eastham

DRILLER: Levi Mainard | **NORTH:** 699890.38 | **EAST:** 1879280.58

GROUND SURFACE ELEVATION: 476.55 | **BORING DEPTH:** 59' | **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-45	13/15/16/20		60		CLAY: dry, orange, with interbedded angular chert fragments and round pebbles				
430.0										
	-50	5/6/11/12		100			CL			
	-55	5/9/9/13		100		CLAY: moist, brown, with rounded pebbles				
420.0						Refusal at 59 ft bgs				
	-60	(50/1)		0						
	-65									

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS008S **PROJECT NAME:** TVA GAF NRS

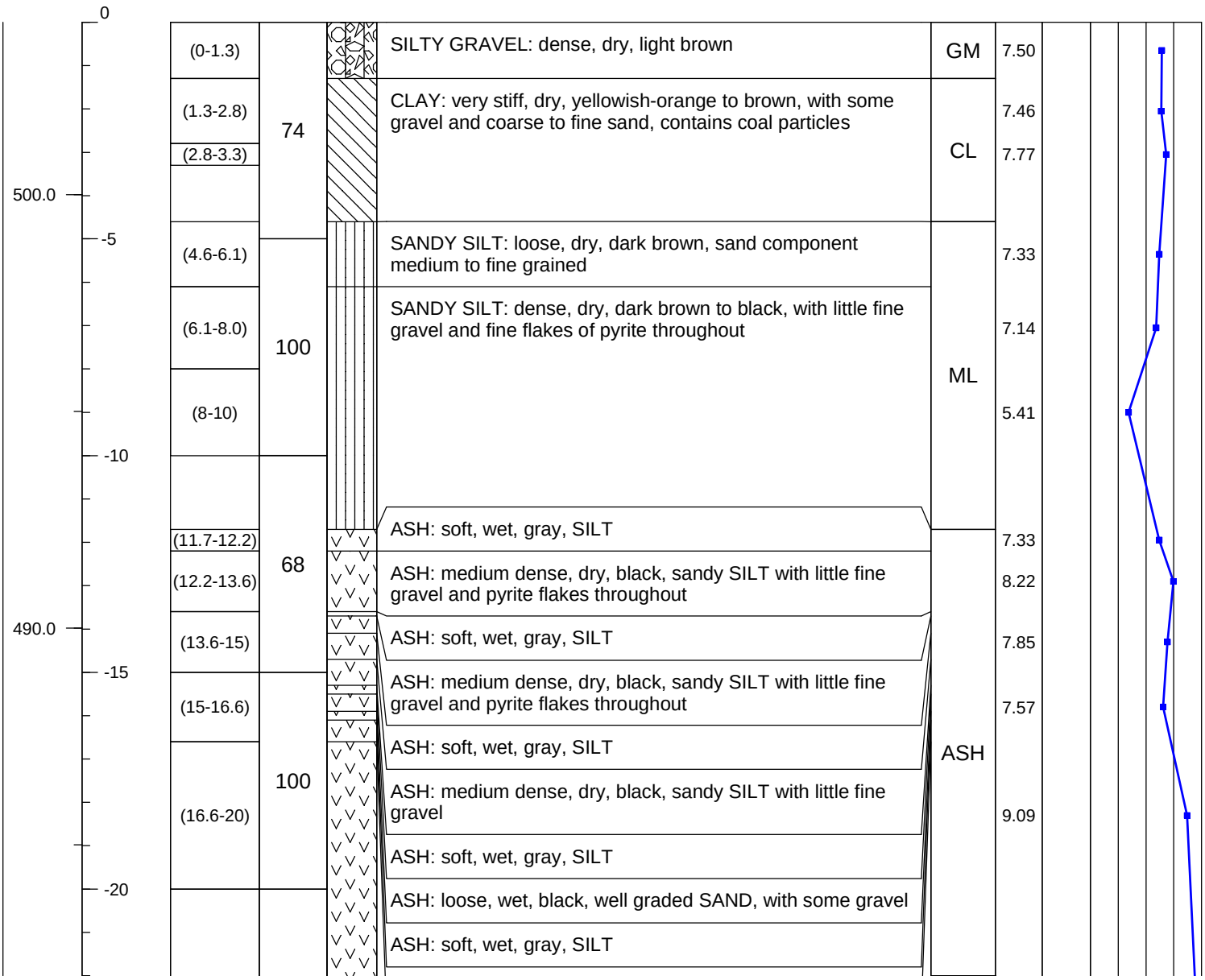
DATE BEGAN: 7/11/2015 **DATE FINISHED:** 7/11/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard **NORTH:** 700374.63 **EAST:** 1880138.62

GROUND SURFACE ELEVATION: 503.98 **BORING DEPTH:** 89' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade



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NRS008S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS008S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/11/2015 **DATE FINISHED:** 7/11/2015 **FIELD ENGINEER:** Joseph Kiker

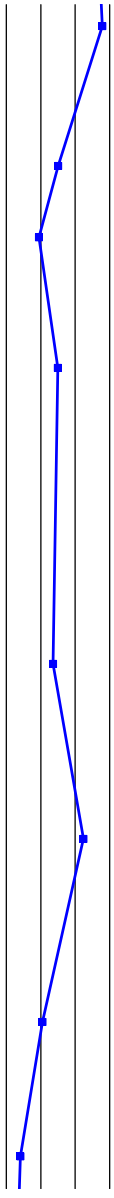
DRILLER: Levi Mainard **NORTH:** 700374.63 **EAST:** 1880138.62

GROUND SURFACE ELEVATION: 503.98 **BORING DEPTH:** 89' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
		(20-24.8)	100		ASH: loose, wet, black, well graded SAND with some gravel		9.62		
					ASH: soft, wet, gray, SILT				
480.0					ASH: medium dense, dry, black, sandy SILT with little fine gravel, contains pyrite flakes				
	-25	(24.8-25)					7.38		
		(25-27.5)			ASH: soft, wet, gray, SILT		6.41		
			100			ASH			
		(27.5-30)					7.36		
	-30								
			30						
470.0		(33.5-35)			CLAY: medium stiff, moist, yellowish-orange, with little silt and fine sand		7.12		
	-35								
		(35-40)	0			CL	8.67		
	-40								
		(40-41.8)			CLAY: stiff, moist, yellowish-orange, some fine sand		6.59		
			100		CLAY: stiff, moist, yellowish-orange and brown mottled, little fine sand and silt, yellowish-orange at 45 ft bgs				
		(41.8-45)					5.46		
460.0									



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NRS008S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS008S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/11/2015 | **DATE FINISHED:** 7/11/2015 | **FIELD ENGINEER:** Joseph Kiker

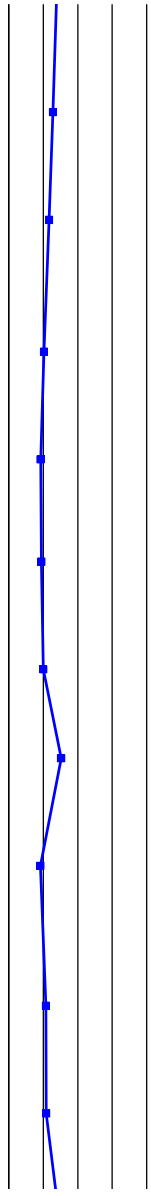
DRILLER: Levi Mainard | **NORTH:** 700374.63 | **EAST:** 1880138.62

GROUND SURFACE ELEVATION: 503.98 | **BORING DEPTH:** 89' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
460.0									
	-45	(45-47)	100				5.24		
		(47-49)					5.05		
	-50	(49-51.9)	100		SILTY CLAY: medium stiff to soft, moist, yellowish-orange, brown and tan mottled, with little fine sand, coarsens down profile	CL	4.79		
		(51.9-53)					4.62		
450.0		(53-55.7)	100		SILTY CLAY: three sequences of brown silty CLAY to red-brown SILT, stiff to medium dense, with a thin layer of medium to coarse grained rounded sand at the base		4.66		
	-55	(55.7-57)			SAND: medium dense, wet, brown, fine grained, poorly graded with little clay	SP	4.75		
		(57-59)	88		SANDY CLAY: stiff, moist, brown	CL	5.66		
					CLAYEY SAND: dense, moist, brown	SC			
	-60	(59-61)			SAND: medium dense, wet, brown, fine grained, poorly graded, with little clay	SP	4.60		
		(61-64.2)	75				4.88		
440.0		(64.2-65)			SANDY CLAY: soft, moist, brown, with little sub-angular to sub-rounded fine gravel, sand component is fine to coarse grained, becomes wet at 66 ft bgs	CL	4.90		
	-65								



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NRS008S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS008S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/11/2015 | **DATE FINISHED:** 7/11/2015 | **FIELD ENGINEER:** Joseph Kiker

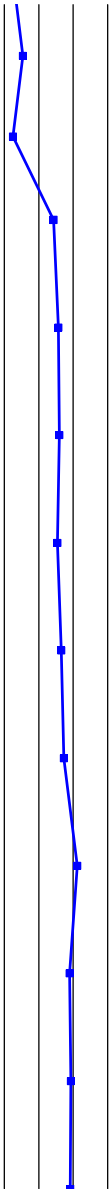
DRILLER: Levi Mainard | **NORTH:** 700374.63 | **EAST:** 1880138.62

GROUND SURFACE ELEVATION: 503.98 | **BORING DEPTH:** 89' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
		(66-67.9)	75		CLAYEY SAND: loose, wet, brown, medium to coarse grained sand component	SC	5.70	
		(67.9-69)			SILTY CLAY: stiff, moist, brown		5.19	
	-70	(69-71)	100		CLAY: very stiff, moist, brown, with little silt and occasional coarse sand to fine gravel, becomes medium stiff with occasional lenses of fine sand at 73 ft bgs		7.25	
		(71-73)					7.50	
430.0		(73-75)	100				7.55	
	-75	(75-77)					7.44	
		(77-79)	100		CLAY: moist, soft, brown, with little fine sand and silt	CL	7.65	
	-80	(79-81)					7.78	
		(81-83)	100		SILTY CLAY: moist, soft, gray to brown, with little fine sand, contains fine-gravel sized pieces of limestone between 88 and 89 ft bgs		8.46	
420.0		(83-85)					8.07	
	-85	(85-87)	100				8.13	
		(87-89)					8.10	



SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS008S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/11/2015 **DATE FINISHED:** 7/11/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard **NORTH:** 700374.63 **EAST:** 1880138.62

GROUND SURFACE ELEVATION: 503.98 **BORING DEPTH:** 89' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
					Refusal at 89 ft bgs	CL			
	-90								
410.0	-95								
	-100								
400.0	-105								
	-110								

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NRS008S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS012S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 | **DATE FINISHED:** 7/8/2015 | **FIELD ENGINEER:** David Carlone

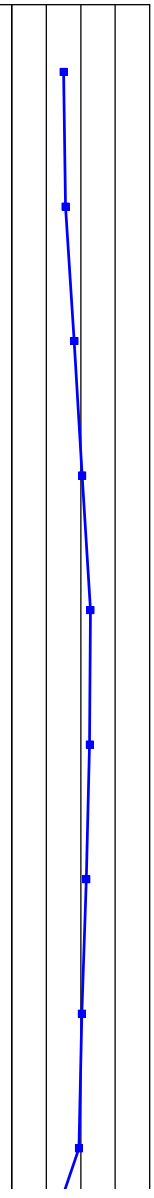
DRILLER: Mickey Ritter | **NORTH:** 699844.53 | **EAST:** 1879530.24

GROUND SURFACE ELEVATION: 472.97 | **BORING DEPTH:** 51' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0	(0-2.5)	100		ASH: black, fine SAND		5.63		
470.0		(2.5-5)			ASH: wet, 3" zone of black sub-angular gravel at 15 ft bgs		5.72		
	-5	(5-7.5)	100				6.18		
		(7.5-10)				ASH	6.57		
	-10	(10-12.5)	100				7.00		
460.0		(12.5-15)					6.96		
	-15	(15-17.5)	80		CLAY: soft, red-brown		6.79		
		(17.5-20)				CL	6.55		
	-20	(20-22.5)	100				6.41		



AECOM

NRS012S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS012S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 | **DATE FINISHED:** 7/8/2015 | **FIELD ENGINEER:** David Carlone

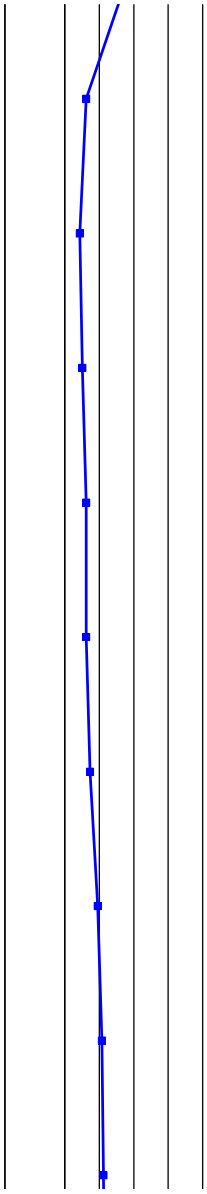
DRILLER: Mickey Ritter | **NORTH:** 699844.53 | **EAST:** 1879530.24

GROUND SURFACE ELEVATION: 472.97 | **BORING DEPTH:** 51' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
450.0		(22.5-25)	100			CL	4.08		
	-25	(25-27.5)					3.76		
		(27.5-30)	100				3.90		
	-30	(30-32.5)					4.08		
440.0		(32.5-35)	90				4.09		
	-35	(35-37.5)			SILTY CLAY: yellow-brown, zones of white silt, black staining at 40 ft bgs		4.29		
		(37.5-40)	100				4.67		
	-40	(40-42.5)					4.88		
430.0		(42.5-45)					4.97		



SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS012S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 **DATE FINISHED:** 7/8/2015 **FIELD ENGINEER:** David Carlone

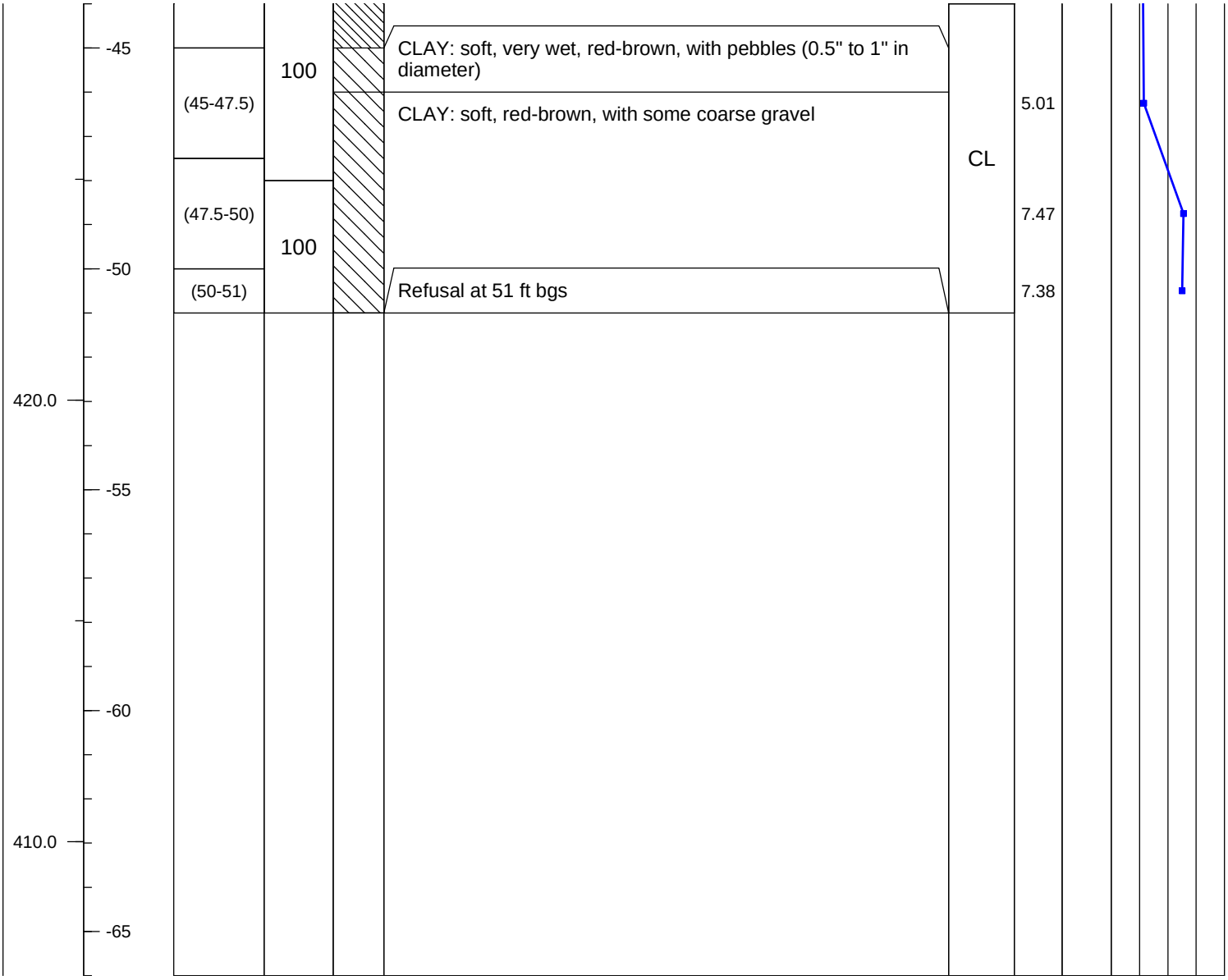
DRILLER: Mickey Ritter **NORTH:** 699844.53 **EAST:** 1879530.24

GROUND SURFACE ELEVATION: 472.97 **BORING DEPTH:** 51' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-45	(45-47.5)	100		CLAY: soft, very wet, red-brown, with pebbles (0.5" to 1" in diameter)	CL	5.01		
					CLAY: soft, red-brown, with some coarse gravel				
		(47.5-50)	100				7.47		
	-50	(50-51)			Refusal at 51 ft bgs		7.38		
420.0									
	-55								
	-60								
410.0									
	-65								



AECOM

NRS012S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS017S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 | **DATE FINISHED:** 7/9/2015 | **FIELD ENGINEER:** David Carlone

DRILLER: Mickey Ritter | **NORTH:** 699510.26 | **EAST:** 1879504.59

GROUND SURFACE ELEVATION: 477.56 | **BORING DEPTH:** 49.5' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0	0-2.5	67		CLAY: stiff, red-brown, some black spots of discoloration, with a soft zone from 5 to 5.5 ft bgs	CL	4.68		
		2.5-5					4.42		
	-5	5-7.5	70				4.21		
470.0		7.5-10					5.02		
	-10	10-12.5	83				5.43		
		12.5-15			CLAY: soft, brown		6.03		
	-15	15-16.5	70		CLAY: soft, very wet, becomes stiff at 15.5 ft bgs		5.01		
		16.5-17.5					6.73		
460.0		17.5-18.5			SILTY CLAY: soft, brown		6.58		
		18.5-20			CLAYEY SAND: soft, wet, red-brown, sub-angular, coarse	SC	5.13		
	-20	20-22.5	90		SILTY CLAY: stiff, wet, red-brown	CL	5.62		

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NRS017S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS017S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 | **DATE FINISHED:** 7/9/2015 | **FIELD ENGINEER:** David Carlone

DRILLER: Mickey Ritter | **NORTH:** 699510.26 | **EAST:** 1879504.59

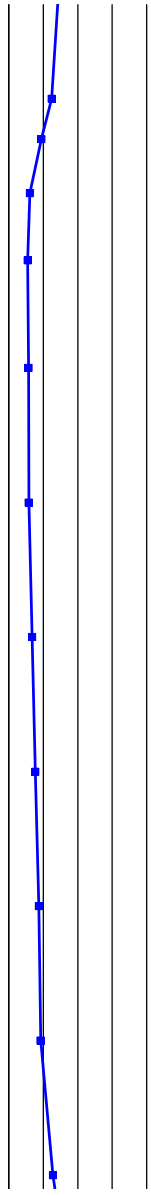
GROUND SURFACE ELEVATION: 477.56 | **BORING DEPTH:** 49.5' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
		22.5-24			SILTY SAND: soft, wet, red-brown	SM	5.18	
		24-25			SILTY CLAY: stiff, red-brown	CL	4.66	
	-25	25-26	100		SILTY SAND: soft, red-brown	SM	4.07	
		26-27.5			SILTY CLAY: stiff, red-brown		3.95	
450.0					CLAY: with rounded pebbles (0.5" - 1" in diameter)			
		27.5-30					4.00	
	-30				SILTY CLAY: soft, very wet			
		30-32.5	80		CLAY: wet, gravelly with angular chert and limestone fragments (greater than 1" in diameter)	CL	4.02	
		32.5-35					4.18	
	-35							
		35-37.5	70		CLAYEY GRAVEL: wet, red-brown, coarse grained, sub-angular to rounded with some pebbles (0.5"-1" in diameter)	GC	4.35	
440.0								
		37.5-40					4.52	
	-40							
		40-42.5	80		GRAVELLY CLAY: stiff, wet, brown-black, with chert pebbles (greater than 1") at 46 ft bgs, contains a three-inch zone of red-brown, subangular coarse SAND at 49.25 ft bgs.	CL	4.62	
		42.5-45					5.24	

SOIL pH GRAPH *3 to 11 S.U.*



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NRS017S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS017S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 **DATE FINISHED:** 7/9/2015 **FIELD ENGINEER:** David Carlone

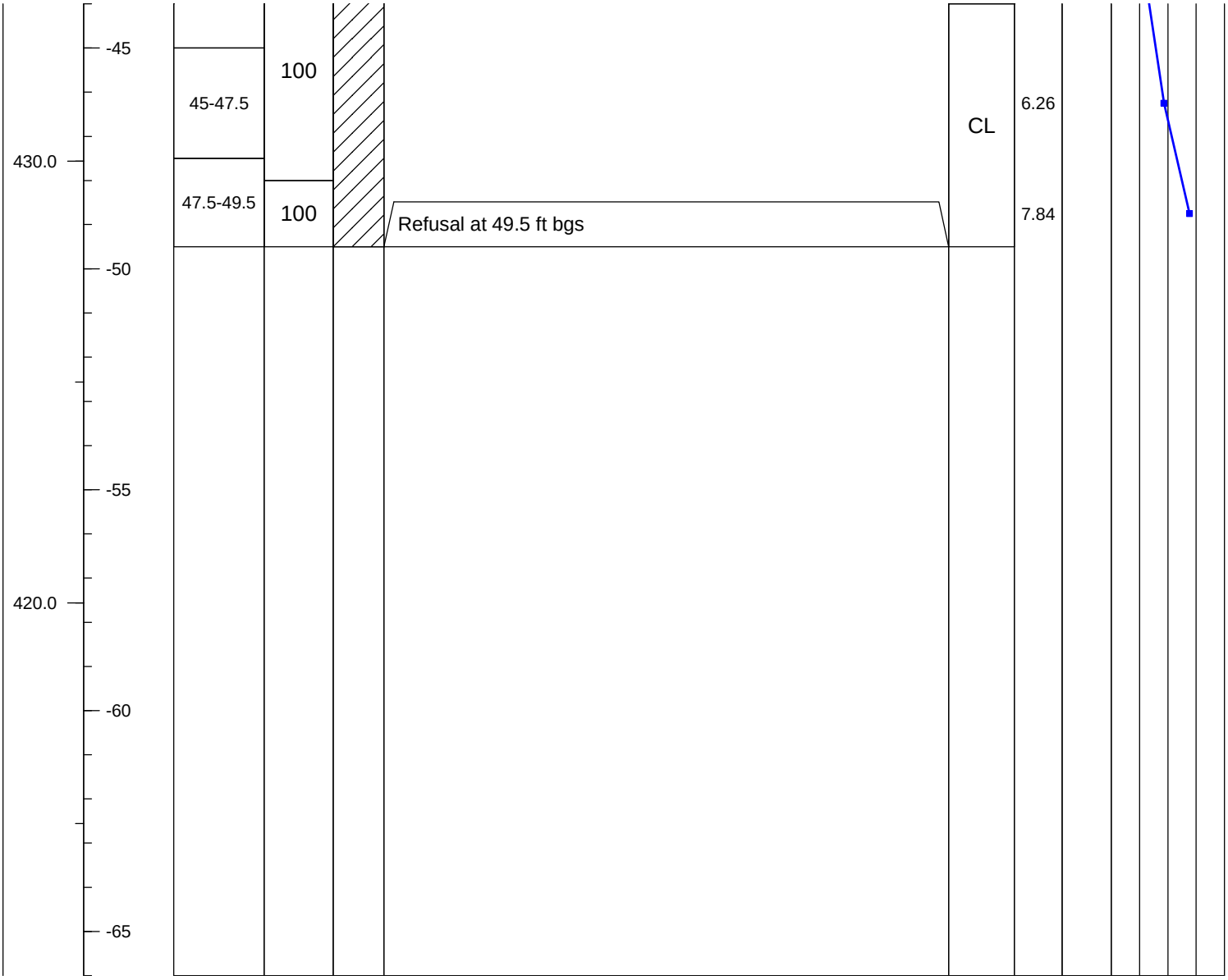
DRILLER: Mickey Ritter **NORTH:** 699510.26 **EAST:** 1879504.59

GROUND SURFACE ELEVATION: 477.56 **BORING DEPTH:** 49.5' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
430.0	-45	45-47.5	100			CL	6.26		
		47.5-49.5	100		Refusal at 49.5 ft bgs		7.84		
420.0	-50								
	-55								
	-60								
	-65								



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NRS017S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS018S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 | **DATE FINISHED:** 7/9/2015 | **FIELD ENGINEER:** David Carlone

DRILLER: Mickey Ritter | **NORTH:** 699335.16 | **EAST:** 1879844.55

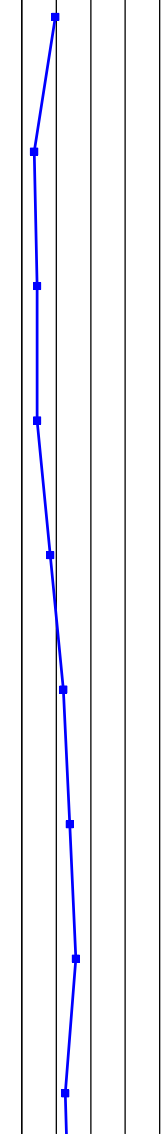
GROUND SURFACE ELEVATION: 482.34 | **BORING DEPTH:** 57.5 | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
480.0	0	(0-2.5)	83		CLAY: stiff, red-brown, black staining from 0 to 1 ft bgs	CL	4.71	
		(2.5-5)					3.63	
	-5	(5-7.5)	80		CLAY: stiff, red-brown, mixed with coarse, sub-angular coal gravel		3.78	
		(7.5-10)					3.78	
	-10	(10-12.5)	80				4.45	
470.0		(12.5-15)			SILTY CLAY: stiff, red-brown		5.11	
	-15	(15-17.5)	60		CLAY: soft, red-brown, with a 2" to 3" zone of coal gravel at 16 ft bgs		5.44	
		(17.5-20)					5.74	
	-20	(20-22.5)	100				5.20	

SOIL pH GRAPH *3 to 11 S.U.*



AECOM

NRS018S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS018S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 **DATE FINISHED:** 7/9/2015 **FIELD ENGINEER:** David Carlone

DRILLER: Mickey Ritter **NORTH:** 699335.16 **EAST:** 1879844.55

GROUND SURFACE ELEVATION: 482.34 **BORING DEPTH:** 57.5 **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
460.0									
		(22.5-25)					5.40		
	-25	(25-27.5)	80		CLAY: stiff, red-brown, interbedded with white silt		5.24		
		(27.5-30)				CL	4.59		
	-30	(30-32.5)	100		SANDY CLAY: soft, red-brown		4.44		
450.0		(32.5-35)					4.50		
	-35	(35-37.5)	100		CLAYEY SAND: soft, wet, red-brown, fine grained	SC	4.29		
		(37.5-40)					4.55		
	-40	(40-42.5)	100		CLAY: stiff, red-brown, with spots of black discoloration	CL	4.65		
440.0		(42.5-45)					4.91		

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NRS018S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS018S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 | **DATE FINISHED:** 7/9/2015 | **FIELD ENGINEER:** David Carlone

DRILLER: Mickey Ritter | **NORTH:** 699335.16 | **EAST:** 1879844.55

GROUND SURFACE ELEVATION: 482.34 | **BORING DEPTH:** 57.5 | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-45	(45-47.5)	90				5.06		
		(47.5-50)			CLAY: stiff, red-brown, mixed with rounded pebbles (~1" in diameter), with spots of black discoloration, contains a 2" to 3" zone of large chert and limestone pebbles greater than 1" in diameter at 50 ft bgs, a 2" zone of angular limestone fragments (greater than 1" in diameter) at 51 ft bgs, and a 1" to 2" zone of angular chert fragments (greater than 1" in diameter) at 57.3 ft bgs		5.95		
	-50	(50-52.5)	100			CL	6.10		
430.0		(52.5-55)					6.40		
	-55	(55-57.5)	100				6.98		
					Refusal at 57.5 ft bgs				
	-60								
420.0									
	-65								

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NRS018S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS020S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/24/2015 | **DATE FINISHED:** 7/24/2015 | **FIELD ENGINEER:** Edward Eastham

DRILLER: Levi Mainard | **NORTH:** 699796.94 | **EAST:** 1880459.10

GROUND SURFACE ELEVATION: 486.98 | **BORING DEPTH:** 21' | **BORING DIAMETER:** 3.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0					CLAY: orange, with rounded pebbles				
	-5	2/3/3/4		50						
480.0										
	-10	2/1/3/3		60		SANDY CLAY: moist, tan with some orange	CL			
	-15	2/3/3/4		100		CLAY: moist, orange, with trace sand				
470.0										
	-20	1/2/1/3		100		Stopped drilling at 21 ft bgs due to inclement weather				

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NRS020S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS022S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/21/2015 **DATE FINISHED:** 7/21/2015 **FIELD ENGINEER:** Edward Eastham

DRILLER: Levi Mainard **NORTH:** 702126.98 **EAST:** 1878816.32

GROUND SURFACE ELEVATION: 483.50 **BORING DEPTH:** 38' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
480.0	0			83		CLAY: stiff, orange to dark orange, somewhat mottled, contains detritus and organics, has organic odor				
	-5	5/5/5/6	(4-6)	80				6.10		
						CLAY: medium stiff, moist, brown, contains organics from 10 to 11 ft bgs, has organic odor				
	-10	1/3/4/4	(9-11)	80			CL	5.51		
470.0						SANDY CLAY: medium stiff, orange with some rounded pebbles, becomes gray from 20.5 to 21 ft bgs				
	-15	3/4/4/4	(14-16)	60				3.75		
	-20	2/4/5/5	(19-21)	100				4.88		
						CLAY: stiff, moist, orange and brown, with small rounded pebbles becoming larger between 34 and				

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NRS022S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS022S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/21/2015 **DATE FINISHED:** 7/21/2015 **FIELD ENGINEER:** Edward Eastham

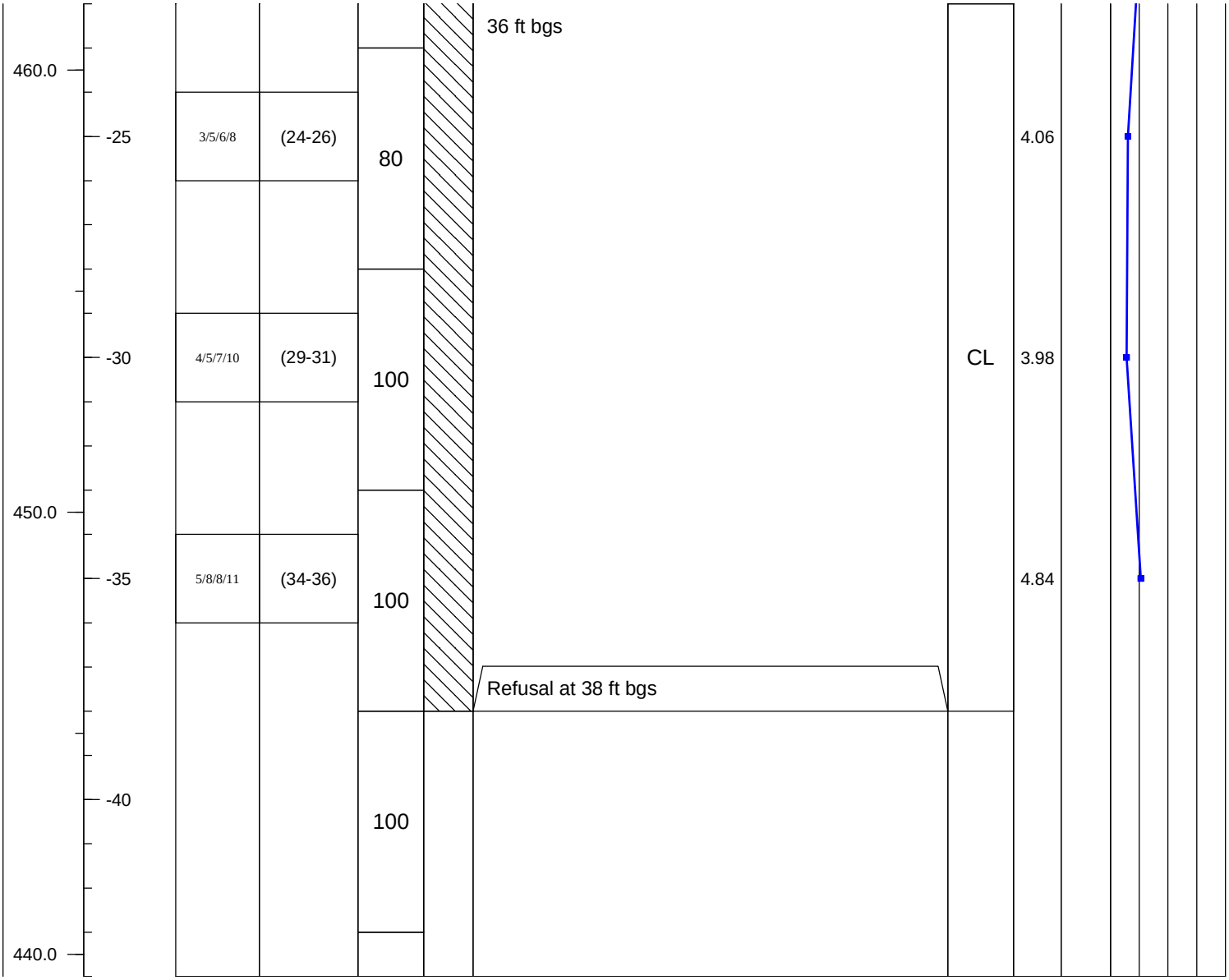
DRILLER: Levi Mainard **NORTH:** 702126.98 **EAST:** 1878816.32

GROUND SURFACE ELEVATION: 483.50 **BORING DEPTH:** 38' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
460.0	-25	3/5/6/8	(24-26)	80		36 ft bgs		4.06		
	-30	4/5/7/10	(29-31)	100			CL	3.98		
450.0	-35	5/8/8/11	(34-36)	100		Refusal at 38 ft bgs		4.84		
	-40			100						
440.0										



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NRS022S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS025S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/7/2015 | **DATE FINISHED:** 7/7/2015 | **FIELD ENGINEER:** Joseph Kiker

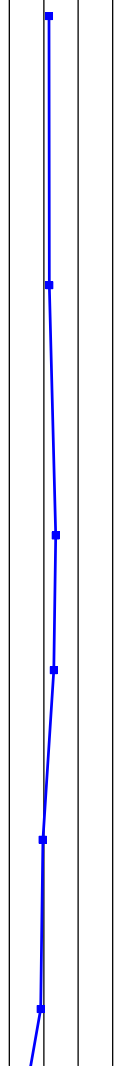
DRILLER: Levi Mainard | **NORTH:** 701601.28 | **EAST:** 1878820.14

GROUND SURFACE ELEVATION: 476.72 | **BORING DEPTH:** 55' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0	(0-5)	40		ASH: soft, wet, gray-black, SILT	ASH	6.76		
	-5	(5-10)	80				6.79		
470.0	-10	(10-14.3)	64		SAND: medium dense, wet, light brown, fine to medium grained and poorly graded, with little silt	SP	7.10		
		(14.3-15)			SILTY CLAY: firm, moist, light brown, some coarse sand and fine gravel, increase in sand content at 16.5 ft bgs, no sand and clay rich at 21.3 ft bgs	CL	7.01		
	-15								
460.0		(16.5-19.1)	70				6.45		
	-20								
		(20-21.9)					6.35		



AECOM

NRS025S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS025S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/7/2015 | **DATE FINISHED:** 7/7/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard | **NORTH:** 701601.28 | **EAST:** 1878820.14

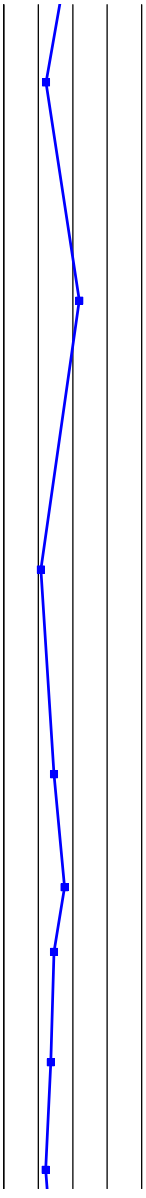
GROUND SURFACE ELEVATION: 476.72 | **BORING DEPTH:** 55' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
		(21.9-25)	84		CLAY: medium stiff to soft, dry, yellowish-orange to gray, mottled	CL	5.15	
	-25							
450.0		(25-30)	100		ASH: soft, wet, gray-black, SILT with little fine sand	ASH	6.83	
	-30	(30-35)	100		CLAY: medium stiff to stiff, moist, yellowish-orange to dark brown, occasional less than 1 cm-thick layers of woody debris		4.89	
	-35	(35-37.6)	70		CLAY: medium stiff, moist, yellowish-orange to dark brown to greenish-gray	CL	5.55	
440.0		(37.6-39.2)					6.08	
		(39.2-40)					5.55	
	-40	(40-43.3)	100		CLAY: stiff, moist, yellowish-orange to greenish-gray and dark brown, mottled, frequent 1/16" scale organic layers		5.39	
		(43.3-44)			CLAY: yellowish-orange with white mottling, some fine sand,		5.13	

SOIL pH GRAPH *3 to 11 S.U.*



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NRS025S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS025S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/7/2015 | **DATE FINISHED:** 7/7/2015 | **FIELD ENGINEER:** Joseph Kiker

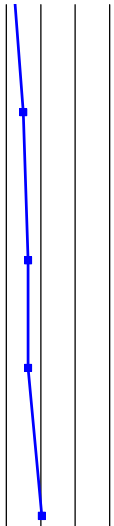
DRILLER: Levi Mainard | **NORTH:** 701601.28 | **EAST:** 1878820.14

GROUND SURFACE ELEVATION: 476.72 | **BORING DEPTH:** 55' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-45	(44-48)	100		frequent 1/16" scale layers of black organics at 44 ft bgs		5.61		
430.0					SANDY CLAY: stiff, moist, some coarse sand and fine gravel, angular to sub-angular				
		(48-49.5)			CLAY: medium stiff, moist, yellowish-orange		5.86		
	-50	(49.5-52)	100		SANDY CLAY: stiff, moist, some coarse sand and fine gravel, angular to sub-angular	CL	5.86		
					CLAY: medium stiff, moist, yellowish-orange, mottled with dark brown at 52 ft bgs				
		(52-55)	100		Boring terminated at 55 ft bgs due to inability to obtain sample		6.56		
	-55								
420.0									
	-60								
	-65								



SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS026S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/7/2015 | **DATE FINISHED:** 7/7/2015 | **FIELD ENGINEER:** Joseph Kiker

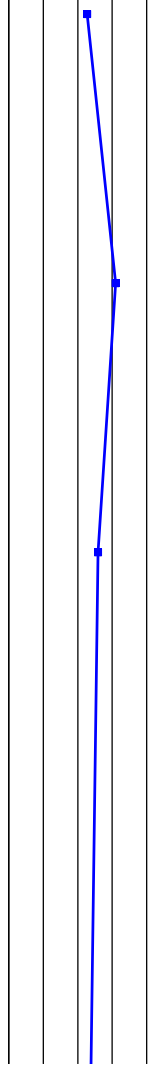
DRILLER: Levi Mainard | **NORTH:** 701726.89 | **EAST:** 1878699.85

GROUND SURFACE ELEVATION: 476.85 | **BORING DEPTH:** 29' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0	(0-5)	46		ASH: soft, moist, gray to black, SILT, wet at 3.1 ft bgs	ASH	6.97		
	-5	(5-10)	100				8.42		
470.0	-10	(10-15)	80				7.53		
	-15		100						
460.0	-20								



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NRS026S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS026S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/7/2015 | **DATE FINISHED:** 7/7/2015 | **FIELD ENGINEER:** Joseph Kiker

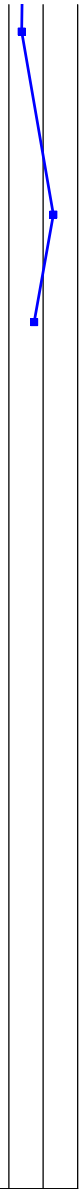
DRILLER: Levi Mainard | **NORTH:** 701726.89 | **EAST:** 1878699.85

GROUND SURFACE ELEVATION: 476.85 | **BORING DEPTH:** 29' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
		(20-25)	100			ASH	7.16		
	-25	(25-26.8)					8.77		
450.0		(26.8-29)	100		CLAY: stiff, moist, dark brown	CL	7.79		
					Refusal at 29 ft bgs				
	-30								
	-35								
440.0									
	-40								



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NRS026S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS029S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 | **DATE FINISHED:** 7/8/2015 | **FIELD ENGINEER:** Joseph Kiker

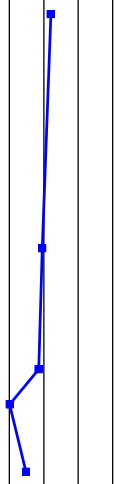
DRILLER: Levi Mainard | **NORTH:** 699844.53 | **EAST:** 1879530.24

GROUND SURFACE ELEVATION: 472.97 | **BORING DEPTH:** 12' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0	(0-5)	46		ASH: soft, wet, gray to black, SILT	ASH	6.86		
	-5	(5-8.7)	80				6.42		
470.0		(8.7-9.5)			CLAY: soft, wet, brown to gray	CL	6.24		
		(9.5-10)					4.77		
	-10	(10-12)	100		CLAY: very stiff, moist, yellowish-orange, some coarse sand and fine gravel		5.59		
					SANDY CLAY: stiff, moist, yellowish-orange and light gray and white mottled, bedding structure				
					Refusal at 12 ft bgs				
	-15								
460.0									
	-20								



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NRS029S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS030S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 | **DATE FINISHED:** 7/8/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard | **NORTH:** 701970.02 | **EAST:** 1878995.56

GROUND SURFACE ELEVATION: 477.01 | **BORING DEPTH:** 31' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0	(0-5)	54		ASH: soft, wet, gray to black, SILT	ASH	6.44		
	-5								
470.0		(7-7.5)	60		CLAY: soft, wet, brown to gray		6.63		
		(7.5-8.2)					6.50		
		(8.2-10)			CLAY: medium stiff to stiff, moist, dark brown, some coarse sand and fine gravel from 8.2 to 8.6 ft bgs, occasional layers of fine gravel from 10 to 15 ft bgs		6.31		
	-10	(10-12.5)	100				6.42		
		(12.5-15)				CL	4.31		
	-15	(15-17.5)			CLAY: medium stiff to stiff, moist, yellowish-orange		4.77		
460.0			100						
		(17.5-20)					5.37		
	-20	(20-21.9)					5.81		

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NRS030S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS030S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 **DATE FINISHED:** 7/8/2015 **FIELD ENGINEER:** Joseph Kiker

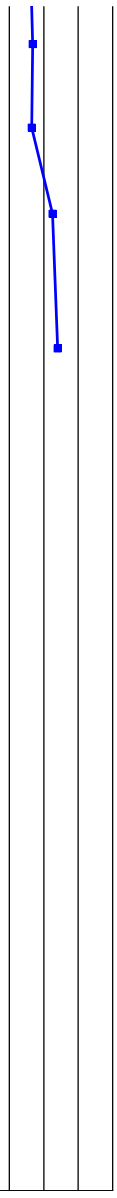
DRILLER: Levi Mainard **NORTH:** 701970.02 **EAST:** 1878995.56

GROUND SURFACE ELEVATION: 477.01 **BORING DEPTH:** 31' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
		(21.9-23.5)	100		CLAY: medium stiff to stiff, moist, greenish-gray and black, with less than 1 cm thick fine sand lenses		5.93		
		(23.5-25)			CLAY: medium stiff to stiff, moist, light brown, black motling, with less than 2 cm thick layers of woody debris	CL	5.89		
	-25	(25-26.7)			CLAY: stiff, moist, light brown		6.94		
					LIMESTONE: weathered, fractured	PWR			
450.0		(26.7-30)	100		CLAY: stiff, moist, light brown, occasional fine gravel consisting of angular limestone	CL	7.21		
	-30		100		Refusal at 31 ft bgs				
	-35								
440.0									
	-40								



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NRS030S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS033S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/20/2015 **DATE FINISHED:** 7/20/2015 **FIELD ENGINEER:** Edward Eastham

DRILLER: Levi Mainard **NORTH:** 701251.50 **EAST:** 1879622.83

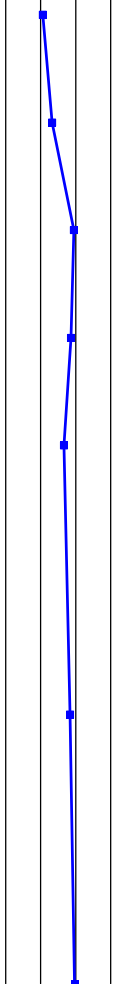
GROUND SURFACE ELEVATION: 506.08 **BORING DEPTH:** 23' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
	0					ASH: dry, dense, black	ASH		
		7/8/23/10	(3-5)	45				6.60	
	-5	6/4/4/8	(5-7)	30				7.07	
500.0		4/5/17/5	(7-9)	50		CLAY: moist, grayish-green to brown		8.15	
	-10	3/4/4/4	(9-11)	5		CLAY: moist, brown, with whitish-gray angular limestone, 2 inches of crused limestone found in shoe at refusal		8.01	
		2/5/7/11	(11-13)	100				7.66	
	-15						CL		
490.0		3/2/4/6	(16-18)	100				7.96	
	-20								
		2/12/5/6	(21-23)	100				8.19	

SOIL pH GRAPH *3 to 11 S.U.*



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NRS033S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS033S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/20/2015 **DATE FINISHED:** 7/20/2015 **FIELD ENGINEER:** Edward Eastham

DRILLER: Levi Mainard **NORTH:** 701251.50 **EAST:** 1879622.83

GROUND SURFACE ELEVATION: 506.08 **BORING DEPTH:** 23' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH ***3 to 11 S.U.***
						Refusal at 23 ft bgs	CL			
	-25									
480.0										
	-30									
	-35									
470.0										
	-40									

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NRS033S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS035S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 **DATE FINISHED:** 7/9/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard **NORTH:** 700522.20 **EAST:** 1880146.58

GROUND SURFACE ELEVATION: 500.87 **BORING DEPTH:** 59' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
500.0	0	(1.8-2.3)	64		SILTY CLAY: stiff, moist, light brown, with little fine to coarse sand	CL	7.92		
		(2.3-4.4)			SILT: loose, dry, brown, with little fine to coarse sand and occasional fine gravel	ML	7.12		
	-5				CLAY: medium stiff, moist, dark brown, with little medium to fine sand and fine gravel	CL			
		(7-7.8)	60		ASH: loose, dry, light brown, medium to fine grained sandy SILT, with potential pyrite grains/staining from 7.8 to 8 ft bgs, and occasional 2 cm thick layers of finer silt-sized ash at 10 ft bgs, wet at 13.3 ft bgs	ASH	4.02	7.12	
		(8-10)					3.95		
	-10								
490.0		(12-13.5)	60				3.82		
		(13.5-15)					5.44		
	-15								
		(15-17.5)	100		ASH: soft, wet, gray to black, SILT, no recovery between 20 and 25 ft bgs		5.98		
		(17.5-20)					9.30		
	-20								
480.0									

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NRS035S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS035S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 | **DATE FINISHED:** 7/9/2015 | **FIELD ENGINEER:** Joseph Kiker

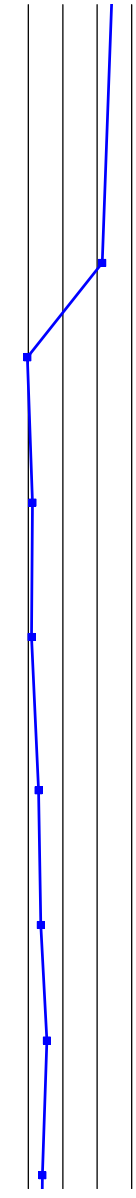
DRILLER: Levi Mainard | **NORTH:** 700522.20 | **EAST:** 1880146.58

GROUND SURFACE ELEVATION: 500.87 | **BORING DEPTH:** 59' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
			0		ASH: loose, wet, black, fine to coarse SAND, well graded, with some fine gravel, contains a piece of pyrite	ASH			
	-25	(26.5-27.1)					8.50	9.29	
		(27.1-30)	70		CLAY: medium stiff, moist, yellowish-orange, with some sand		4.71		
470.0	-30	(30-32.5)					4.96		
		(32.5-35)	100				4.92		
	-35	(35-38.2)				CL	5.28		
		(38.2-40)	100		SANDY CLAY: medium stiff, moist, yellowish-orange		5.38		
460.0	-40	(40-42.5)					5.70		
		(42.5-45)	100				5.46		



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NRS035S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS035S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 **DATE FINISHED:** 7/9/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard **NORTH:** 700522.20 **EAST:** 1880146.58

GROUND SURFACE ELEVATION: 500.87 **BORING DEPTH:** 59' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-45	(45-49)	100			CL	5.39		
		(49-50)			SAND: medium dense, wet, yellowish-orange, fine SAND, poorly graded, with little clay and silt, moist at 52 ft bgs, tan with some organics at 54.3 ft bgs		4.82		
	-50	(50-54.3)	100			SP	5.25		
450.0		(54.3-55)					5.22		
	-55	(55-58)	100				5.12		
		(58-59)			CLAY: stiff, moist, brown, 1" diameter piece of limestone at base	CL	5.54		
					Refusal at 59 ft bgs				
	-60								
440.0									
	-65								

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS036S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 | **DATE FINISHED:** 7/10/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard | **NORTH:** 700240.83 | **EAST:** 1880457.56

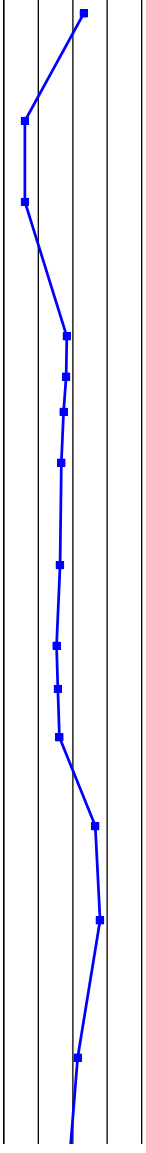
GROUND SURFACE ELEVATION: 502.51 | **BORING DEPTH:** 74' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	DESCRIPTION	USCS	SOIL pH	WATER pH
	0	(0-2)		SILT: medium dense, dry, brown, little fine gravel, roots, blackish-brown from 0.6 to 1.3 ft bgs, more clay at 1.3 ft bgs	ML	7.06	
500.0		(2-4)	100	SILT: loose, dry, blackish-brown, little fine to coarse sand and fine gravel		4.07	
	-5	(4-5)		ASH: medium dense, dry, black to gray-black, SILT with some fine to coarse sand and little fine gravel		4.07	
		(6.6-7.4)		ASH: medium dense, moist, gray-black, SILT, coarse sand-sized pyritic grains		6.19	
		(7.4-8.1)	68	ASH: medium dense, wet, gray-black, sandy SILT		6.17	
		(8.1-8.7)				6.04	
		(8.7-10)		ASH: soft, moist, light brown and gray-black, mottled, silty CLAY		5.92	
	-10	(10.2-12.3)		ASH: soft, wet, gray-black, SILT with little sand, pyritic material between 9.4 and 10 ft bgs		5.85	
490.0		(12.3-13.2)	54	ASH: dense, dry, gray-black, SILT with some fine to coarse sand and little fine gravel, blackish-brown from 12.3 to 13.2 ft bgs, no sand at 13.2 ft bgs	ASH	5.68	
		(13.2-13.9)				5.74	
		(13.9-15)		ASH: loose, dry, gray-black, SAND, well graded, with some fine gravel, becomes wet at 15 ft bgs		5.82	
	-15	(15.1-17.1)				7.65	
		(17.1-18.6)	90	ASH: soft, wet, gray, SILT		7.88	9.26
				ASH: loose, wet, gray-black, SAND, well graded, with some fine gravel			
	-20	(20-20.8)				6.75	
				ASH: soft, wet, gray, SILT			

SOIL pH GRAPH *3 to 11 S.U.*



AECOM

NRS036S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS036S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 | **DATE FINISHED:** 7/10/2015 | **FIELD ENGINEER:** Joseph Kiker

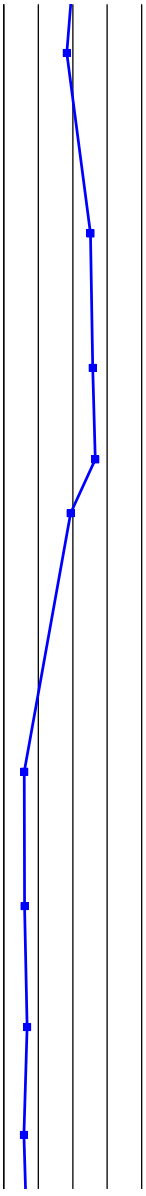
DRILLER: Levi Mainard | **NORTH:** 700240.83 | **EAST:** 1880457.56

GROUND SURFACE ELEVATION: 502.51 | **BORING DEPTH:** 74' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
480.0		(20.8-25)	100				6.20		
	-25	(25-27.5)					7.40		
		(27.5-30)	100			ASH	7.52		
	-30	(30-30.9)					7.65		
		(30.9-32)					6.40		
470.0			100						
	-35	(35-37.5)			CLAY: soft to stiff, moist, yellowish-orange, with little brown fine sand and silt, becomes stiff at 40 ft bgs		4.04		
		(37.5-40)	100			CL	4.06		
	-40	(40-42)					4.18		
460.0		(42-44)	100				4.03		



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NRS036S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS036S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 **DATE FINISHED:** 7/10/2015 **FIELD ENGINEER:** Joseph Kiker

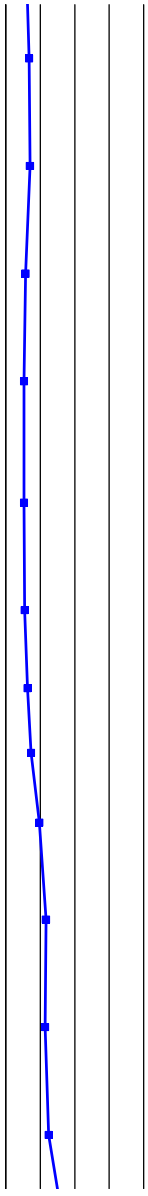
DRILLER: Levi Mainard **NORTH:** 700240.83 **EAST:** 1880457.56

GROUND SURFACE ELEVATION: 502.51 **BORING DEPTH:** 74' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-45	(44-46)	100		SANDY CLAY: soft, moist, brown and tan, mottled		4.18		
		(46-48)					4.23		
		(48-50)	100			CL	4.00		
	-50	(50-52)					3.93		
450.0		(52-54.5)	100				3.92		
	-55	(54.5-56)			CLAYEY SAND: medium dense, moist, brown	SC	3.95		
		(56-57.4)	100				4.10		
		(57.4-58.4)			SAND: medium dense, wet, fine grained, poorly graded, with little fines	SP	4.28		
		(58.4-60)			SANDY CLAY: stiff, moist, brown, with layers of organics, becomes more sandy between 62.3 and 64 ft bgs		4.71		
	-60	(60-62)					5.04		
440.0		(62-64)	100			CL	4.99		
	-65	(64-66)	100				5.18		



SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS036S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 **DATE FINISHED:** 7/10/2015 **FIELD ENGINEER:** Joseph Kiker

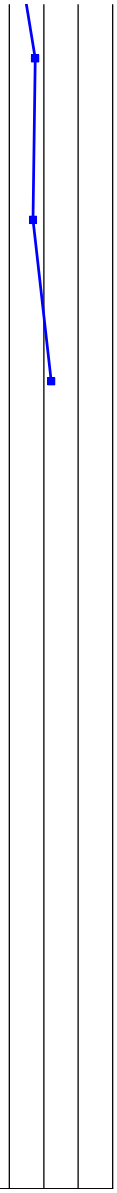
DRILLER: Levi Mainard **NORTH:** 700240.83 **EAST:** 1880457.56

GROUND SURFACE ELEVATION: 502.51 **BORING DEPTH:** 74' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
		(66-68)					6.06		
	-70	(68-72)	100		CLAY: medium stiff, moist, brown, little coarse sand and fine gravel, contains black organics	CL	5.96		
430.0		(72-74)	65		Refusal at 74 ft bgs		6.88		
	-75								
	-80								
420.0									
	-85								



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NRS036S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS040S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 | **DATE FINISHED:** 7/8/2015 | **FIELD ENGINEER:** David Carlone

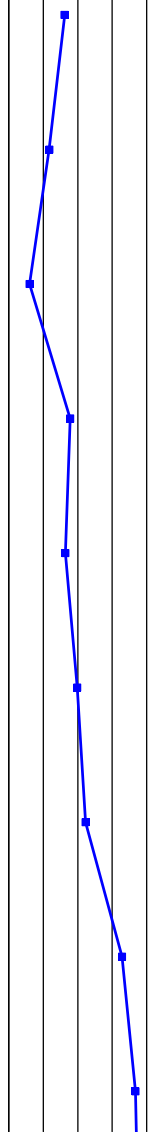
DRILLER: Mickey Ritter | **NORTH:** 700100.04 | **EAST:** 1879774.92

GROUND SURFACE ELEVATION: 480.43 | **BORING DEPTH:** 48' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
480.0	0		0		Pushed with point, no recovery				
		(0-2.5)	100		ASH: fine grained	ASH	5.84		
		(2.5-5)			ASH: coarse grained, coal gravel		5.06		
	-5	(5-7.5)	60				4.05		
		(7.5-10)					6.12		
470.0	-10	(10-12.5)	30		ASH: fine grained, contains limestone fragments		5.88		
		(12.5-15)			ASH: very wet, fine grained		6.48		
	-15	(15-17.5)	100				6.89	6.69	
		(17.5-20)					8.75		
460.0	-20	(20-22.5)	40				9.42		



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NRS040S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS040S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 **DATE FINISHED:** 7/8/2015 **FIELD ENGINEER:** David Carlone

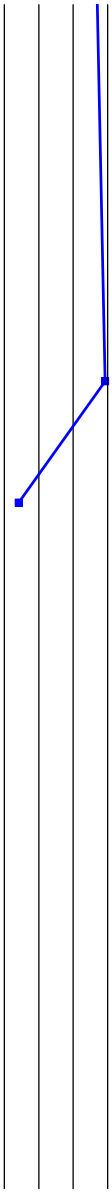
DRILLER: Mickey Ritter **NORTH:** 700100.04 **EAST:** 1879774.92

GROUND SURFACE ELEVATION: 480.43 **BORING DEPTH:** 48' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-25		0			ASH	9.87		
		(28-30)							
450.0	-30	(30-32.5)	100				5.48		
					CLAY: red-brown with spots of black discoloration, with coarse rounded gravel, no recovery after 33 ft bgs except for slough at 43 ft bgs				
	-35		0			CL			
440.0	-40		0						



SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS040S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 **DATE FINISHED:** 7/8/2015 **FIELD ENGINEER:** David Carlone

DRILLER: Mickey Ritter **NORTH:** 700100.04 **EAST:** 1879774.92

GROUND SURFACE ELEVATION: 480.43 **BORING DEPTH:** 48' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-45		43		Refusal at 48 ft bgs	CL			
430.0	-50								
	-55								
420.0	-60								
	-65								

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NRS040S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS043S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 **DATE FINISHED:** 7/9/2015 **FIELD ENGINEER:** Joseph Kiker

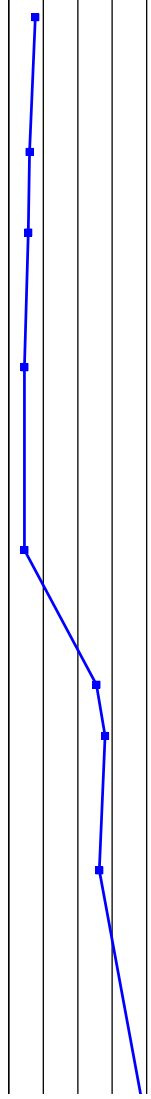
DRILLER: Levi Mainard **NORTH:** 700722.15 **EAST:** 1879658.81

GROUND SURFACE ELEVATION: 498.35 **BORING DEPTH:** 43' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0	(0-4)	64		ASH: medium dense, dry, brown to light brown with black mottling, sandy SILT		4.35		
		(4-5)			ASH: black, wet at 4.6 ft bgs, with little fine gravel at 5 ft bgs		4.05		
	-5	(5-7)	100				3.99		
490.0		(7-10)			ASH: soft, wet, gray to black, SILT	ASH	3.80		
	-10	(10-13.8)	100				3.80		
		(13.8-15)			ASH: loose, wet, black, sandy SILT		7.45		
	-15	(15-15.7)	100				7.89		
480.0		(15.7-20)			ASH: soft, wet, gray to black, SILT		7.59		
	-20								



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NRS043S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS043S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/9/2015 | **DATE FINISHED:** 7/9/2015 | **FIELD ENGINEER:** Joseph Kiker

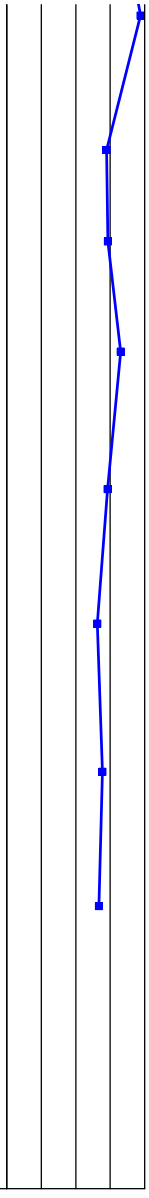
DRILLER: Levi Mainard | **NORTH:** 700722.15 | **EAST:** 1879658.81

GROUND SURFACE ELEVATION: 498.35 | **BORING DEPTH:** 43' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
		(20-24.4)	100			ASH	9.78	
	-25	(24.4-25)			CLAY: soft, moist, brown		8.06	
		(25.9-26.9)			CLAY: stiff, brown to gray		8.13	
470.0		(26.9-30)	82		SILTY CLAY: stiff, moist, brown		8.78	
	-30	(30-32)			CLAY: stiff, moist, gray to brown, with some silt and little fine sand, contains a 4 cm thick layer of poorly graded angular gravel at 32.1 ft bgs, with occasional coarse gravel from 32.15 to 43 ft bgs, increase in fine sand from 40 to 43 ft bgs	CL	8.12	
		(32-35)	100				7.59	
	-35	(35-37.5)					7.86	
460.0		(37.5-40)	100				7.68	
	-40		100		CLAYEY SAND: dense, moist, yellowish-orange, poorly graded	SC		
					Refusal at 43 ft bgs			



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NRS043S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS044S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 | **DATE FINISHED:** 7/8/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard | **NORTH:** 701158.53 | **EAST:** 1879380.61

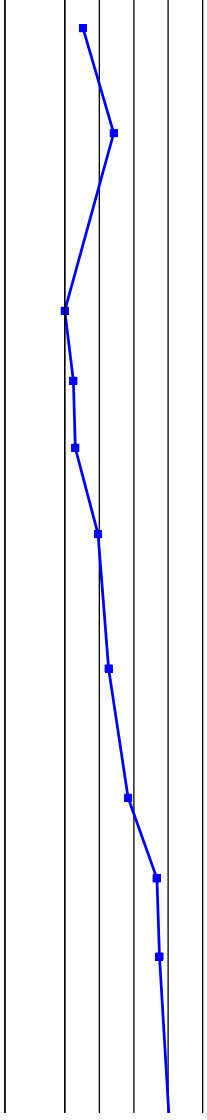
GROUND SURFACE ELEVATION: 496.95 | **BORING DEPTH:** 51.5' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	DESCRIPTION	USCS	SOIL pH	WATER pH
	0			GRAVEL: road surface	GP		
		(1.4-2.3)	80	SANDY CLAY: very stiff, dry, yellowish-orange, light brown and tan mottled, with some fine gravel	CL	3.92	
		(2.3-4.6)		ASH: loose, dry, gray to black, SILT	ASH	5.48	
	-5						
490.0		(6.7-7.5)	66	CLAY: stiff, dry, yellowish-orange, with some coarse sand and fine gravel	CL	2.30	
		(7.5-9.3)		ASH: medium dense, dry, gray to black, SILT	ASH	3.44	
		(9.3-10)		CLAY: stiff, dry, yellowish-orange, with some coarse sand and fine gravel		3.53	
	-10	(10-12.5)	90	CLAY: stiff, dry, light brown, with some coarse sand and fine gravel		4.68	
		(12.5-15)			CL	5.23	
	-15	(15-17.3)	100			6.22	
480.0		(17.3-18)		CLAYEY GRAVEL: dense, dry, light brown, well graded		7.67	
	-20	(18-21.2)	60		GC	7.81	
				Well Graded Gravel: loose, dry, gray	GW		

SOIL pH GRAPH *3 to 11 S.U.*



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NRS044S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS044S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 | **DATE FINISHED:** 7/8/2015 | **FIELD ENGINEER:** Joseph Kiker

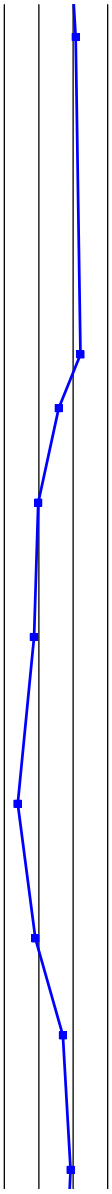
DRILLER: Levi Mainard | **NORTH:** 701158.53 | **EAST:** 1879380.61

GROUND SURFACE ELEVATION: 496.95 | **BORING DEPTH:** 51.5' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
		(22.2-23)			CLAY: stiff, dry, light brown		8.38		
			0						
	-25					CL			
								10.07	
470.0			40						
		(28-29)			CLAYEY GRAVEL: dense, dry, light brown, well graded	GC	8.61		
		(29-30)			CLAY: soft to stiff, moist, light brown, dark brown and black mottling		7.51		
	-30								
		(30-32.5)			CLAY: stiff, moist, yellowish-orange		6.48		
			100						
		(32.5-35)					6.26		
	-35					CL			
460.0		(35-38.7)	100				5.43		
		(38.7-40)			SILTY CLAY: stiff, moist, yellowish-orange and greenish-gray mottling, with little fine sand and some black organics, occasional fine gravel sized angular limestone from 40 to 42.3 ft bgs		6.33		
	-40								
		(40-42.3)			CLAYEY GRAVEL: stiff, moist, yellowish-orange, poorly graded, gravel is composed of limestone		7.73		
			100			GC			
		(42.3-45)			SILTY CLAY: stiff, moist, yellowish-orange and greenish-gray mottling, with little fine sand, and some black organics	CL	8.11		



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NRS044S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS044S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/8/2015 **DATE FINISHED:** 7/8/2015 **FIELD ENGINEER:** Joseph Kiker

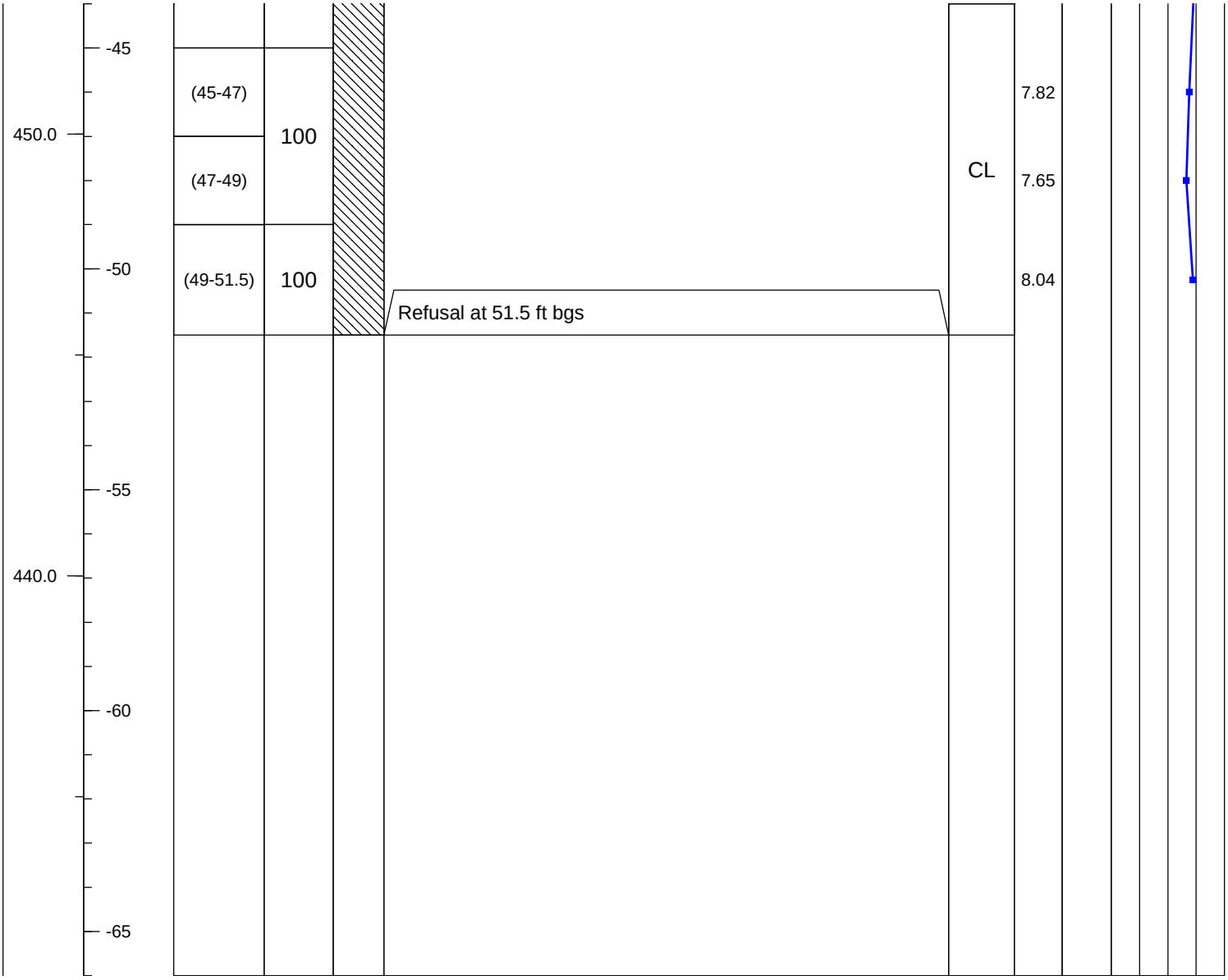
DRILLER: Levi Mainard **NORTH:** 701158.53 **EAST:** 1879380.61

GROUND SURFACE ELEVATION: 496.95 **BORING DEPTH:** 51.5' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
450.0	-45	(45-47)	100			CL	7.82		
		(47-49)					7.65		
	-50	(49-51.5)	100		Refusal at 51.5 ft bgs		8.04		
440.0	-55								
	-60								
	-65								



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NRS044S Boring Log
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1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS046S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/13/2015 **DATE FINISHED:** 7/13/2015 **FIELD ENGINEER:** Joseph Kiker

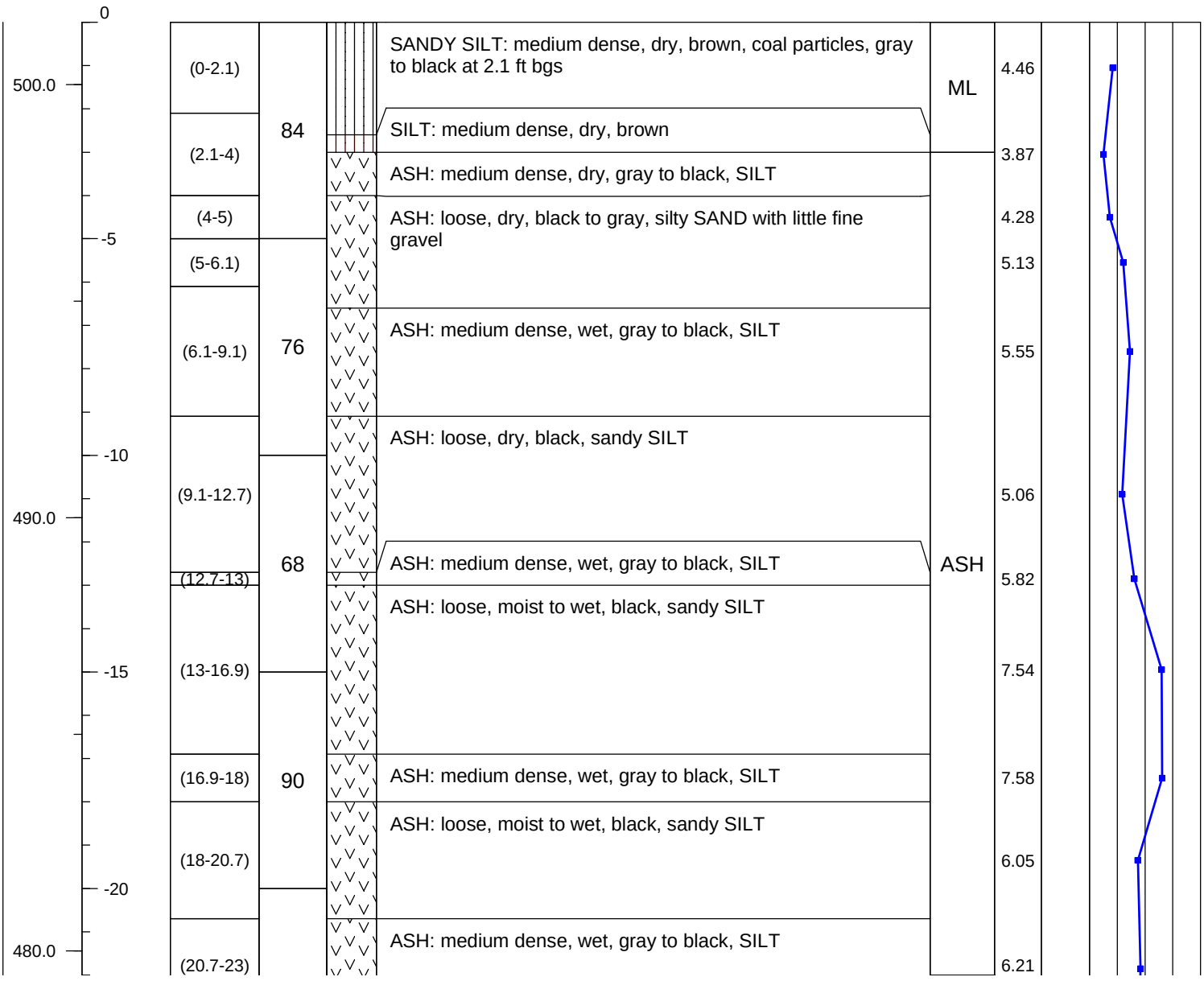
DRILLER: Levi Mainard **NORTH:** 700326.79 **EAST:** 1880298.05

GROUND SURFACE ELEVATION: 501.44 **BORING DEPTH:** 76' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
500.0	0	(0-2.1)	84		SANDY SILT: medium dense, dry, brown, coal particles, gray to black at 2.1 ft bgs	ML	4.46		
		(2.1-4)			SILT: medium dense, dry, brown		3.87		
	-5	(4-5)			ASH: medium dense, dry, gray to black, SILT		4.28		
		(5-6.1)			ASH: loose, dry, black to gray, silty SAND with little fine gravel		5.13		
		(6.1-9.1)	76		ASH: medium dense, wet, gray to black, SILT		5.55		
	-10	(9.1-12.7)			ASH: loose, dry, black, sandy SILT		5.06		
490.0		(12.7-13)	68		ASH: medium dense, wet, gray to black, SILT	ASH	5.82		
	-15	(13-16.9)			ASH: loose, moist to wet, black, sandy SILT		7.54		
		(16.9-18)	90		ASH: medium dense, wet, gray to black, SILT		7.58		
		(18-20.7)			ASH: loose, moist to wet, black, sandy SILT		6.05		
	-20								
480.0		(20.7-23)			ASH: medium dense, wet, gray to black, SILT		6.21		



AECOM

NRS046S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS046S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/13/2015 | **DATE FINISHED:** 7/13/2015 | **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard | **NORTH:** 700326.79 | **EAST:** 1880298.05

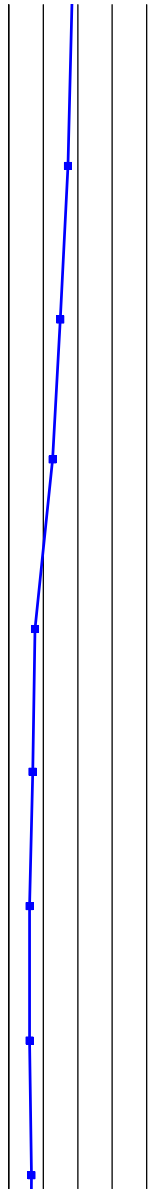
GROUND SURFACE ELEVATION: 501.44 | **BORING DEPTH:** 76' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
			100			ASH	6.01	
	-25	(23-27)						
		(27-28.7)	100		SILTY CLAY: soft, wet, light brown, silty CLAY to clayey SILT	CL	5.62	
		(28.7-32.2)			CLAYEY SILT: soft, moist, light brown, black and dark brown, mottled	ML	5.23	
	-30							
470.0		(32.2-35)	10		CLAY: medium stiff to stiff, dry, brown, with little silt		4.33	
	-35	(35-37.5)					4.21	
		(37.5-40)	10			CL	4.06	
	-40							
460.0		(40-42.5)					4.06	
			100		CLAY: stiff, dry, brown, with some silt and fine sand			
		(42.5-45)			CLAYEY SILT: medium stiff, moist, brown, with little sand	ML	4.15	

SOIL pH GRAPH *3 to 11 S.U.*



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NRS046S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS046S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/13/2015 | **DATE FINISHED:** 7/13/2015 | **FIELD ENGINEER:** Joseph Kiker

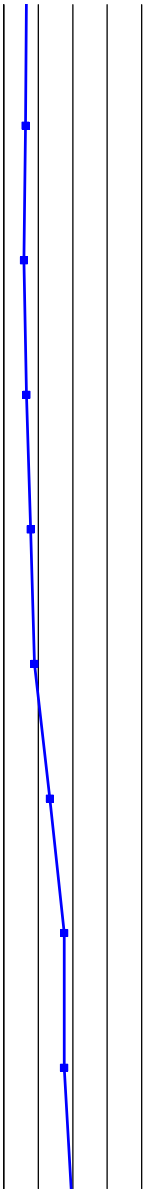
DRILLER: Levi Mainard | **NORTH:** 700326.79 | **EAST:** 1880298.05

GROUND SURFACE ELEVATION: 501.44 | **BORING DEPTH:** 76' | **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology | **DRILL EQUIP:** Geoprobe 7822DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
					SILTY CLAY: stiff, moist, brown, with little fine sand	CL			
	-45	(45-47.5)	100		CLAYEY SAND: medium dense, moist, brown, with fine grained sand component	SC	4.11		
		(47.5-50)			CLAYEY SILT: medium dense, moist, brown, with some fine sand	ML	4.03		
	-50	(50-52.5)	100		SILTY SAND: medium dense, moist, with little clay and fine grained sand component		4.16		
450.0		(52.5-55)					4.37		
	-55	(55-57.5)	66			SM	4.56		
		(57.5-60)					5.33		
	-60	(60-62.5)	68		GRAVELLY CLAY: very stiff, dry, brown to dark brown, with little fine sand and silt		6.07		
440.0		(62.5-65)				CL	6.06		
	-65								



SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS046S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/13/2015 **DATE FINISHED:** 7/13/2015 **FIELD ENGINEER:** Joseph Kiker

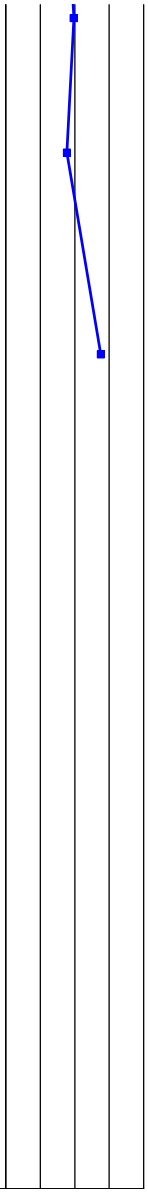
DRILLER: Levi Mainard **NORTH:** 700326.79 **EAST:** 1880298.05

GROUND SURFACE ELEVATION: 501.44 **BORING DEPTH:** 76' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
		(65-67.5)	36				6.45		
		(67.5-70)					6.10		
	-70								
430.0		(70-75)	26		SILTY CLAY: medium stiff, moist, dark brown, with little fine sand	CL	7.82		
	-75		100		Unknown provenance of recovery				
					Refusal at 76 ft bgs				
	-80								
420.0									
	-85								



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NRS046S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS047SA **PROJECT NAME:** TVA GAF NRS

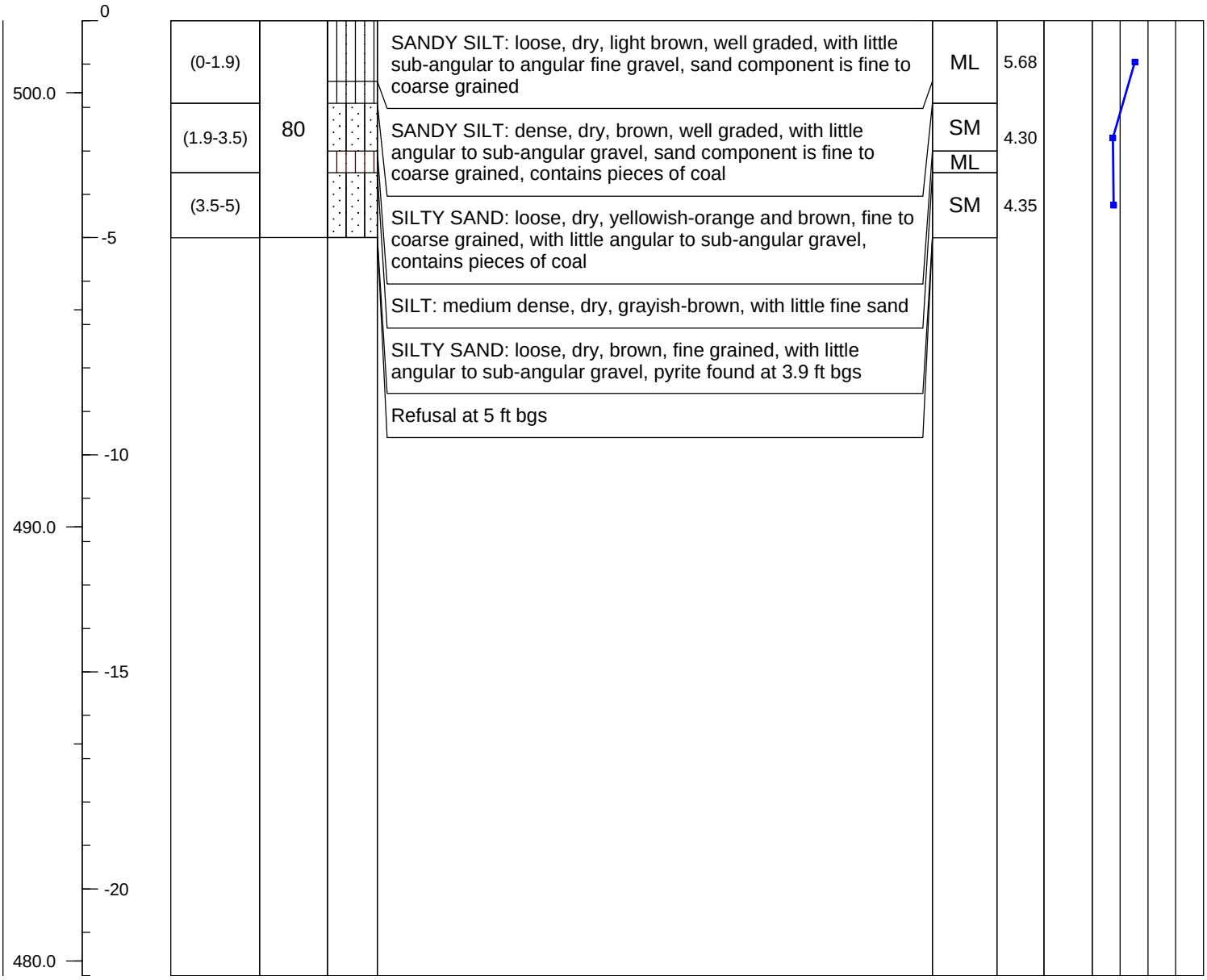
DATE BEGAN: 7/13/2015 **DATE FINISHED:** 7/13/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard **NORTH:** 700175.50 **EAST:** 1880403.85

GROUND SURFACE ELEVATION: 501.66 **BORING DEPTH:** 5' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade



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NRS047SA Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS047SC **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/13/2015 **DATE FINISHED:** 7/13/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard **NORTH:** 700188.44 **EAST:** 1880331.84

GROUND SURFACE ELEVATION: 503.81 **BORING DEPTH:** 5' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
500.0	0	(2.5-5)	78		SANDY SILT: stiff, dry, brown, with little gravel, sand component is fine to coarse grained	ML	6.51		
					SILTY SAND: dense, dry, yellowish-orange and brown, fine to coarse grained, with very little gravel, contains coal	SM			
	-5				SAND: loose, moist, brown, fine to medium grained, with some clay and some fine gravel at 4.7 ft bgs	SC			
					Refusal at 5 ft bgs				
490.0	-10								
	-15								
	-20								

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NRS047SC Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS047SD **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/13/2015 **DATE FINISHED:** 7/13/2015 **FIELD ENGINEER:** Joseph Kiker

DRILLER: Levi Mainard **NORTH:** 700240.93 **EAST:** 1880375.58

GROUND SURFACE ELEVATION: 501.77 **BORING DEPTH:** 5' **BORING DIAMETER:** 2.25"

DRILLING METHOD: Direct Push Technology **DRILL EQUIP:** Geoprobe 7822DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
500.0	0	(0-2.3)	100		SAND: loose, moist, fine to coarse grained, with some clay and little gravel	SW	6.70		
		(2.3-5)			SANDY SILT: loose, dry, yellowish-orange and brown, sand component is fine to coarse	ML	4.86		
	-5				SANDY SILT: loose, dry, brown, sand component is fine to coarse grained				
					Refusal 5 ft bgs				
	-10								
490.0									
	-15								
	-20								
480.0									

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NRS047SD Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS048S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/16/2015 **DATE FINISHED:** 7/16/2015 **FIELD ENGINEER:** David Carlone

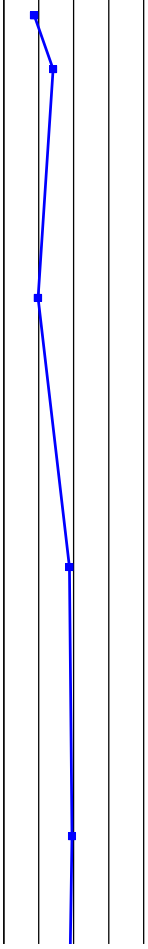
DRILLER: Levi Mainard **NORTH:** 699401.92 **EAST:** 1880078.41

GROUND SURFACE ELEVATION: 483.59 **BORING DEPTH:** 71' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
480.0	0					CLAY: medium stiff, red-brown with black spots of discoloration, contains some pebbles	CL			
	-5	1/3/4/4	(4-5.5)	75				4.52		
			(5.5-6)			ASH: black, coarse grained	ASH	5.47		
						CLAY: very stiff, red-brown with some black discoloration, stiff with no discoloration between 14 and 19 ft bgs, no discoloration after 24 ft bgs				
	-10	5/7/8/9	(9-11)	75				4.71		
470.0							CL			
	-15	4/7/6/8	(14-16)	100				6.29		
	-20	7/9/9/13	(19-21)	100				6.41		



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NRS048S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS048S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/16/2015 **DATE FINISHED:** 7/16/2015 **FIELD ENGINEER:** David Carlone

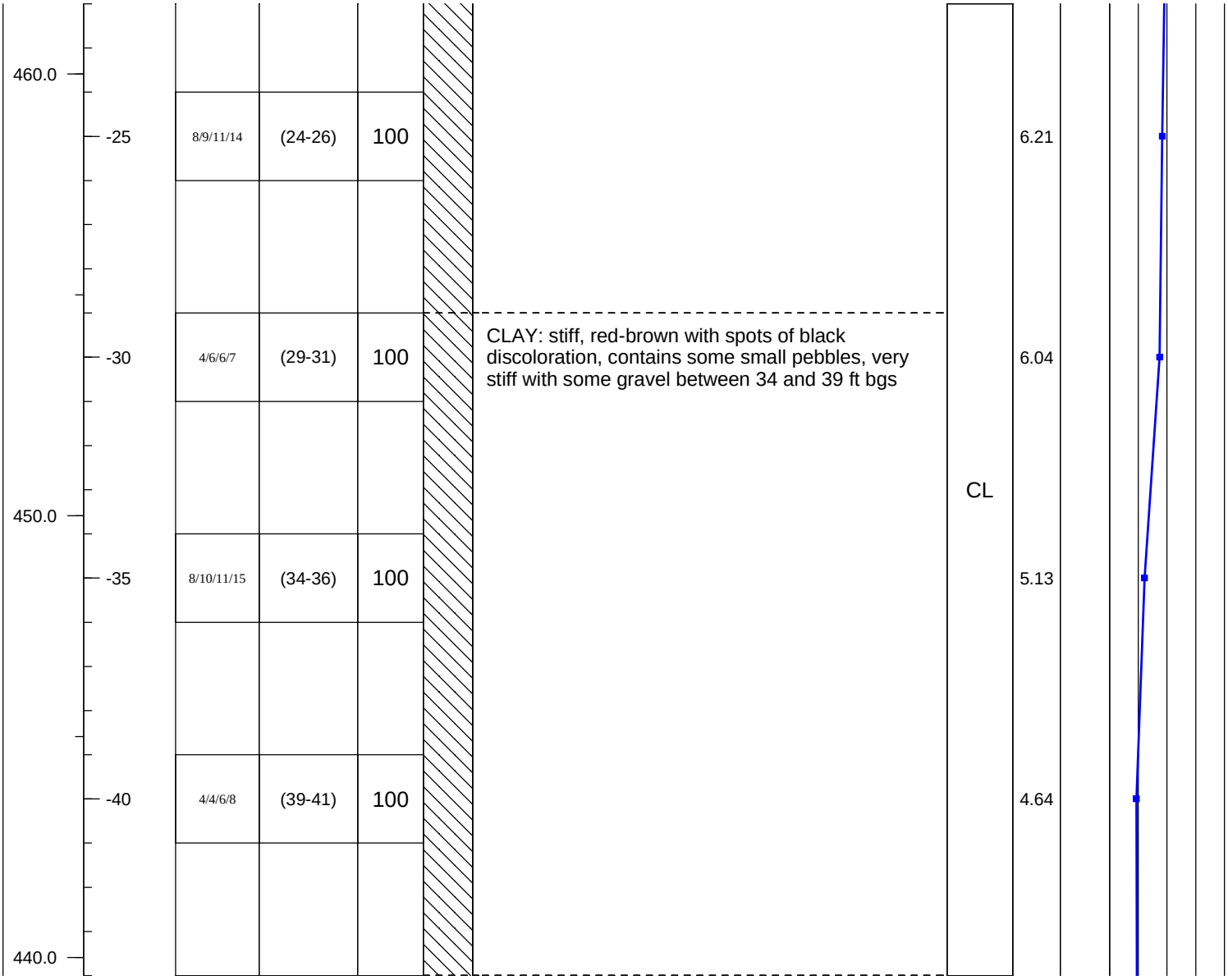
DRILLER: Levi Mainard **NORTH:** 699401.92 **EAST:** 1880078.41

GROUND SURFACE ELEVATION: 483.59 **BORING DEPTH:** 71' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
460.0										
	-25	8/9/11/14	(24-26)	100				6.21		
	-30	4/6/6/7	(29-31)	100		CLAY: stiff, red-brown with spots of black discoloration, contains some small pebbles, very stiff with some gravel between 34 and 39 ft bgs	CL	6.04		
450.0										
	-35	8/10/11/15	(34-36)	100				5.13		
	-40	4/4/6/8	(39-41)	100				4.64		
440.0										



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NRS048S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS048S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/16/2015 | **DATE FINISHED:** 7/16/2015 | **FIELD ENGINEER:** David Carlone

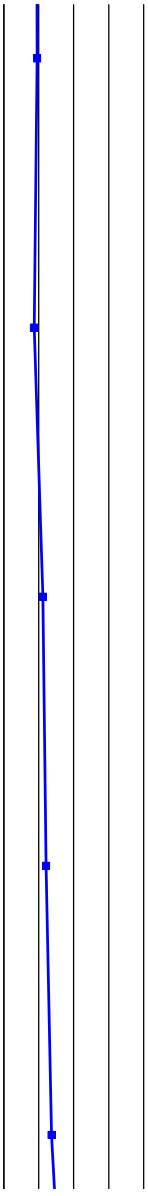
DRILLER: Levi Mainard | **NORTH:** 699401.92 | **EAST:** 1880078.41

GROUND SURFACE ELEVATION: 483.59 | **BORING DEPTH:** 71' | **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
	-45	9/9/11/13	(44-46)	66		CLAYEY GRAVEL: very stiff, red-brown	GC	4.67	
	-50	6/8/9/14	(49-51)	66				4.52	
430.0	-55	5/6/9/11	(54-56)	100		CLAY: stiff, red-brown, black staining between 54 and 55 ft bgs		4.96	
	-60	5/6/6/4	(59-61)	66		GRAVELLY CLAY: stiff, red-brown, very soft and wet at 64 ft bgs	CL	5.12	
420.0	-65	0/0/0/0	(64-66)	96				5.39	



SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS048S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/16/2015 **DATE FINISHED:** 7/16/2015 **FIELD ENGINEER:** David Carlone

DRILLER: Levi Mainard **NORTH:** 699401.92 **EAST:** 1880078.41

GROUND SURFACE ELEVATION: 483.59 **BORING DEPTH:** 71' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-70	0/0/0/0	(69-71)	100		Refusal at 71 ft bgs	CL	6.12		
410.0	-75									
	-80									
400.0	-85									

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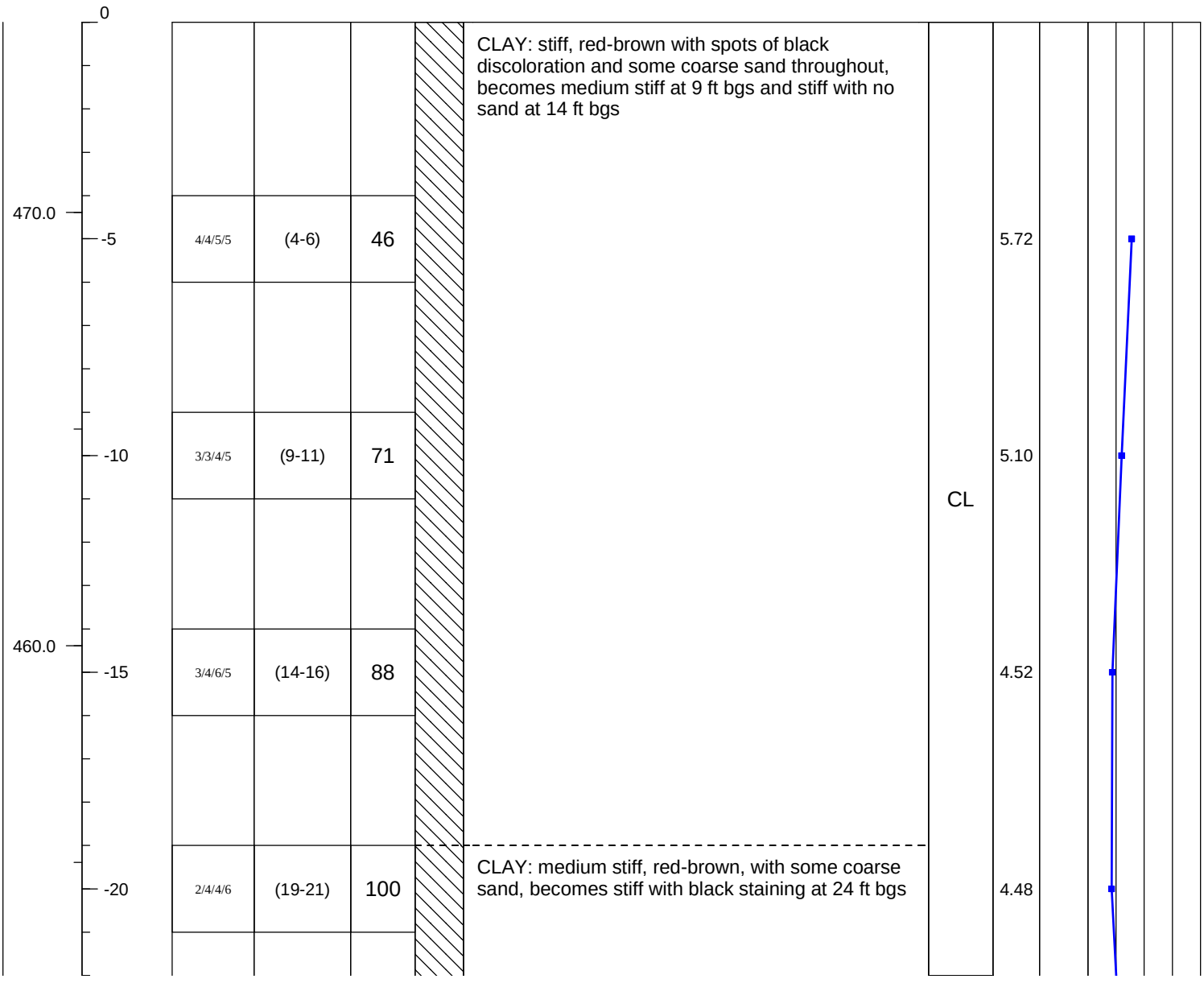
NRS048S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833
BORING NO: NRS049S
PROJECT NAME: TVA GAF NRS
DATE BEGAN: 7/17/2015
DATE FINISHED: 7/17/2015
FIELD ENGINEER: Edward Eastham
DRILLER: Levi Mainard
NORTH: 700798.02
EAST: 1878746.82
GROUND SURFACE ELEVATION: 474.39
BORING DEPTH: 57'
BORING DIAMETER: 3.25"
DRILLING METHOD: Standard Penetration Test
DRILL EQUIP: Geoprobe 8040DT
CHECKED BY: JMK
CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	0					CLAY: stiff, red-brown with spots of black discoloration and some coarse sand throughout, becomes medium stiff at 9 ft bgs and stiff with no sand at 14 ft bgs				
470.0	-5	4/4/5/5	(4-6)	46				5.72		
	-10	3/3/4/5	(9-11)	71			CL	5.10		
460.0	-15	3/4/6/5	(14-16)	88				4.52		
	-20	2/4/4/6	(19-21)	100		CLAY: medium stiff, red-brown, with some coarse sand, becomes stiff with black staining at 24 ft bgs		4.48		



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NRS049S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW
CHECKED BY: JMK
PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS049S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/17/2015 **DATE FINISHED:** 7/17/2015 **FIELD ENGINEER:** Edward Eastham

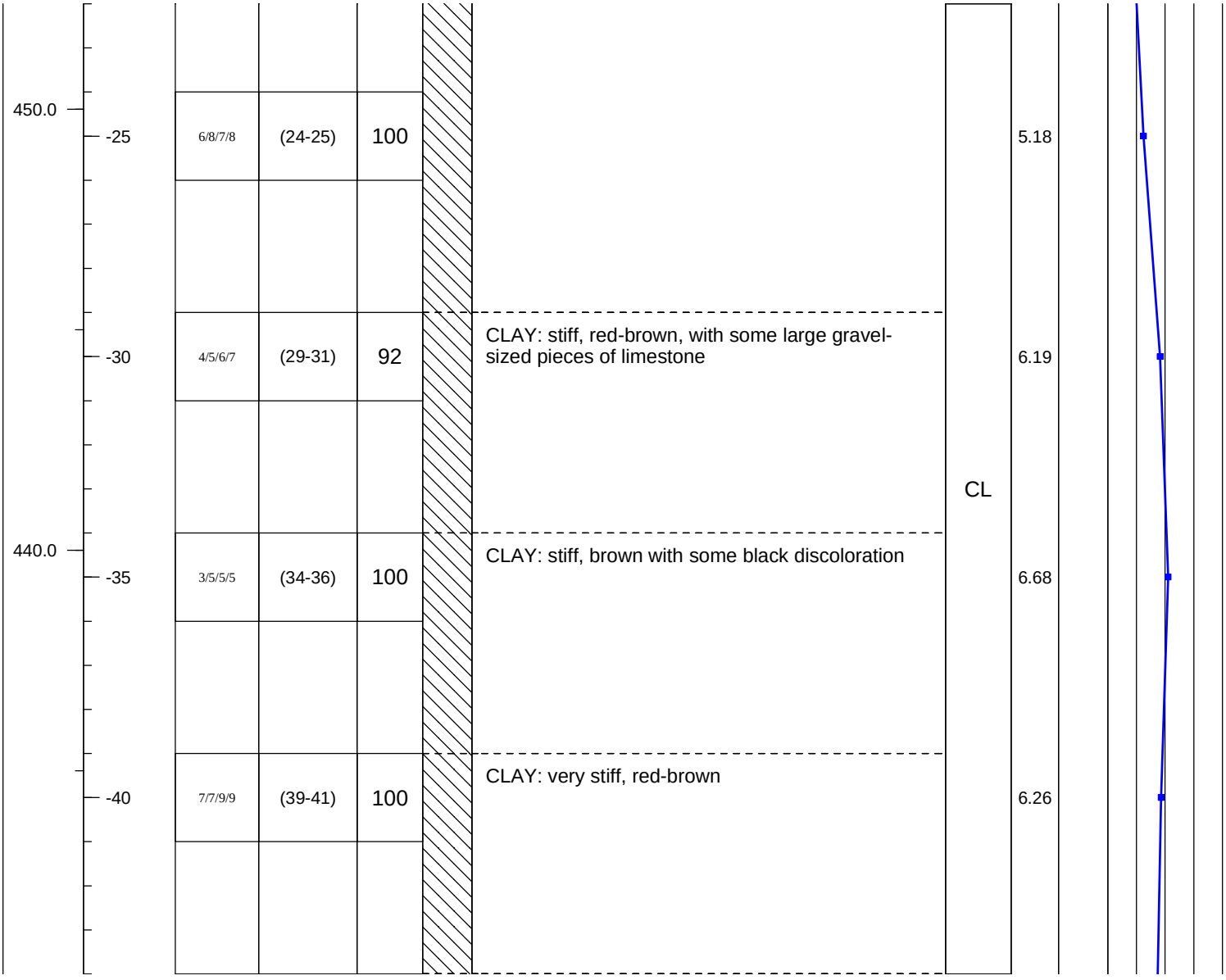
DRILLER: Levi Mainard **NORTH:** 700798.02 **EAST:** 1878746.82

GROUND SURFACE ELEVATION: 474.39 **BORING DEPTH:** 57' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
450.0	-25	6/8/7/8	(24-25)	100				5.18		
	-30	4/5/6/7	(29-31)	92		CLAY: stiff, red-brown, with some large gravel-sized pieces of limestone	CL	6.19		
440.0	-35	3/5/5/5	(34-36)	100		CLAY: stiff, brown with some black discoloration		6.68		
	-40	7/7/9/9	(39-41)	100		CLAY: very stiff, red-brown		6.26		



SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS049S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/17/2015 **DATE FINISHED:** 7/17/2015 **FIELD ENGINEER:** Edward Eastham

DRILLER: Levi Mainard **NORTH:** 700798.02 **EAST:** 1878746.82

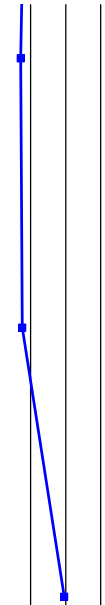
GROUND SURFACE ELEVATION: 474.39 **BORING DEPTH:** 57' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH
430.0	-45	4/4/5/7	(44-46)	100		CLAY: stiff, very wet, red-brown with spots of discoloration and bands of white silty clay		5.99	
	-50	6/8/9/11	(49-51)	79		SANDY CLAY: stiff, very wet, red-brown with spots of discoloration and bands of white silty clay, sand fraction is coarse grained	CL	6.08	
420.0	-55	19/7/18/16	(54-56)	58		GRAVELLY CLAY: very stiff, red-brown, with coarse angular limestone gravel at top and bottom of 2' SPT sample		8.18	
						Refusal at 57 ft bgs			
410.0	-60								
	-65								

SOIL pH GRAPH *3 to 11 S.U.*



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Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 | **BORING NO:** NRS050S | **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/18/2015 | **DATE FINISHED:** 7/20/12015 | **FIELD ENGINEER:** Edward Eastham

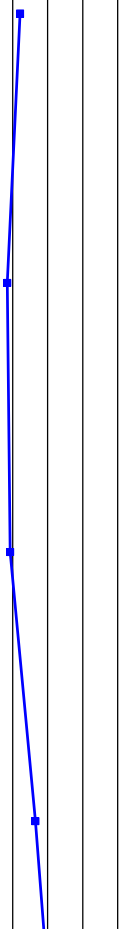
DRILLER: Levi Mainard | **NORTH:** 700445.31 | **EAST:** 1879949.32

GROUND SURFACE ELEVATION: 502.57 | **BORING DEPTH:** 64.25' | **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test | **DRILL EQUIP:** Geoprobe 8040DT | **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
500.0	0					ASH/CLAY: dark brown to black coal ash interbedded with yellow-brown clay, contains fine gravel sized pieces of coal	ASH			
	-5	7/5/11/10	(4-6)	75				5.12		
	-10	31/23/21/17	(9-11)	92		ASH: black		4.47		
490.0	-15	15/9/1/1	(14-16)	100		ASH: wet, fine (FLY ASH)		4.62		
	-20	0/1/2/5	(19-21)	100				5.88		



AECOM

NRS050S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS050S **PROJECT NAME:** TVA GAF NRS

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DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
480.0										
	-25	1/3/4/5	(24-26)	100			ASH	6.92		
	-30	4/5/8/9	(29-30)	100				7.04		
			(30-31)			CLAY: very stiff, red-brown		6.42		
470.0										
	-35	7/8/8/8	(34-36)	100		CLAY: with zones of white silty clay	CL	6.22		
	-40	3/4/5/6	(39-41)	100				5.42		
460.0										

AECOM

NRS050S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

SOIL BORING LOG

PROJECT NO: 60407833 **BORING NO:** NRS050S **PROJECT NAME:** TVA GAF NRS

DATE BEGAN: 7/18/2015 **DATE FINISHED:** 7/20/12015 **FIELD ENGINEER:** Edward Eastham

DRILLER: Levi Mainard **NORTH:** 700445.31 **EAST:** 1879949.32

GROUND SURFACE ELEVATION: 502.57 **BORING DEPTH:** 64.25' **BORING DIAMETER:** 3.25"

DRILLING METHOD: Standard Penetration Test **DRILL EQUIP:** Geoprobe 8040DT **CHECKED BY:** JMK

CONTRACTOR: Cascade

ELEVATION (ft. amsl)	DEPTH (ft.)	BLOWS/ 6 in.	SOIL pH SAMPLE DEPTH (ft. - ft.)	REC (%)	PROFILE	DESCRIPTION	USCS	SOIL pH	WATER pH	SOIL pH GRAPH *3 to 11 S.U.*
	-45	2/4/6/5	(44-46)	100				5.80		
	-50	4/5/7/8	(49-51)	33		SANDY CLAY: red-brown, with sub-rounded coarse gravel sized particles		5.94		
450.0										
	-55	3/4/5/6	(54-56)	83		CLAY: stiff, red-brown, with zones of white silty clay and some fine gravel sized particles	CL	6.43		
	-60	2/2/3/5	(59-61)	100		CLAY: soft, light brown with some layers of angular chert		6.42		
440.0										
		13/(50/1)	(64-64.25)	100		Refusal at 64.25 ft bgs		7.48		
	-65									

AECOM

NRS050S Boring Log
TVA Gallatin Non-Registered Site
1499 Steam Plant Rd., Gallatin, TN 37066
Sumner Co., Tennessee

DRAWN BY: AJW | CHECKED BY: JMK | PROJECT NO: 60407833

NRS Historical Well Boring Logs

GAF Well Details

Well ID	Location	Latitude	Longitude	1-inch diameter PVC well installed?	Northing (ft)	Easting (ft)	Depth of Boring (ft)	Depth of Ash Bottom (ft)	Depth to saturation during boring (ft)	Depth below grade to water in PZ (ft)	1-inch diameter PVC well installed?	Top of screen below grade (ft)	Bottom of screen below grade (ft)	Stick-up (ft)	Estimated Grade Elevation (ft)	Material Screened
GP-1	**G1**	36.31861	-86.41130	Yes	701560.06	1878836.40	20	11.6	5	10.27	Yes	6.05	11.05	3.94	476.98	Bottom ash
GP-2	**G2**	36.31727	-86.40897	Yes	701039.59	1879507.98	32	31.7	8.8	13.78	Yes	22	27	3.67	495.81	Fly ash
GP-3	**G3**	36.31734	-86.41142	Yes	701073.33	1878795.86	22	18	9	7.08	Yes	12.93	17.93	3.48	467.94	Fly ash
GP-4	**G4**	36.31514	-86.40968	Yes	700269.33	1879302.77	28	26.5	5.5	10.27	Yes	23.4	28.4	4.33	470.71	Fly ash
GP-5	**G5**	36.31566	-86.40722	Yes	700459.37	1880018.80	32	31.5	8.8	13.71	Yes	22	27	3.35	502.06	Bottom ash
GP-6	**G6**	36.31338	-86.40797	Yes	699631.63	1879801.40	28	24	9.5	15.65	Yes	18.5	23.5	4.04	482.39	Fly ash

MONITORING WELL INSTALLATION RECORD

PROJECT: Gallatin Fossil Fuel Plant

WELL NUMBER: Well 6 | INSTALLATION DATE: 9-19-89

PLANT COORDINATES EAST: 1880896.18 | NORTH: 700290.45

GROUND SURFACE ELEVATION: 491.50' | TOP OF INNER CASING: 493.92'

GRANULAR BACKFILL MATERIAL: Sand, Bentonite & Grout | SLOT SIZE: 0.10"

CASING MATERIAL: 4" PVC | CASING DIAMETER: 4" PVC

DRILLING TECHNIQUE: Auger | DRILLING CONTRACTOR: Charlie Young

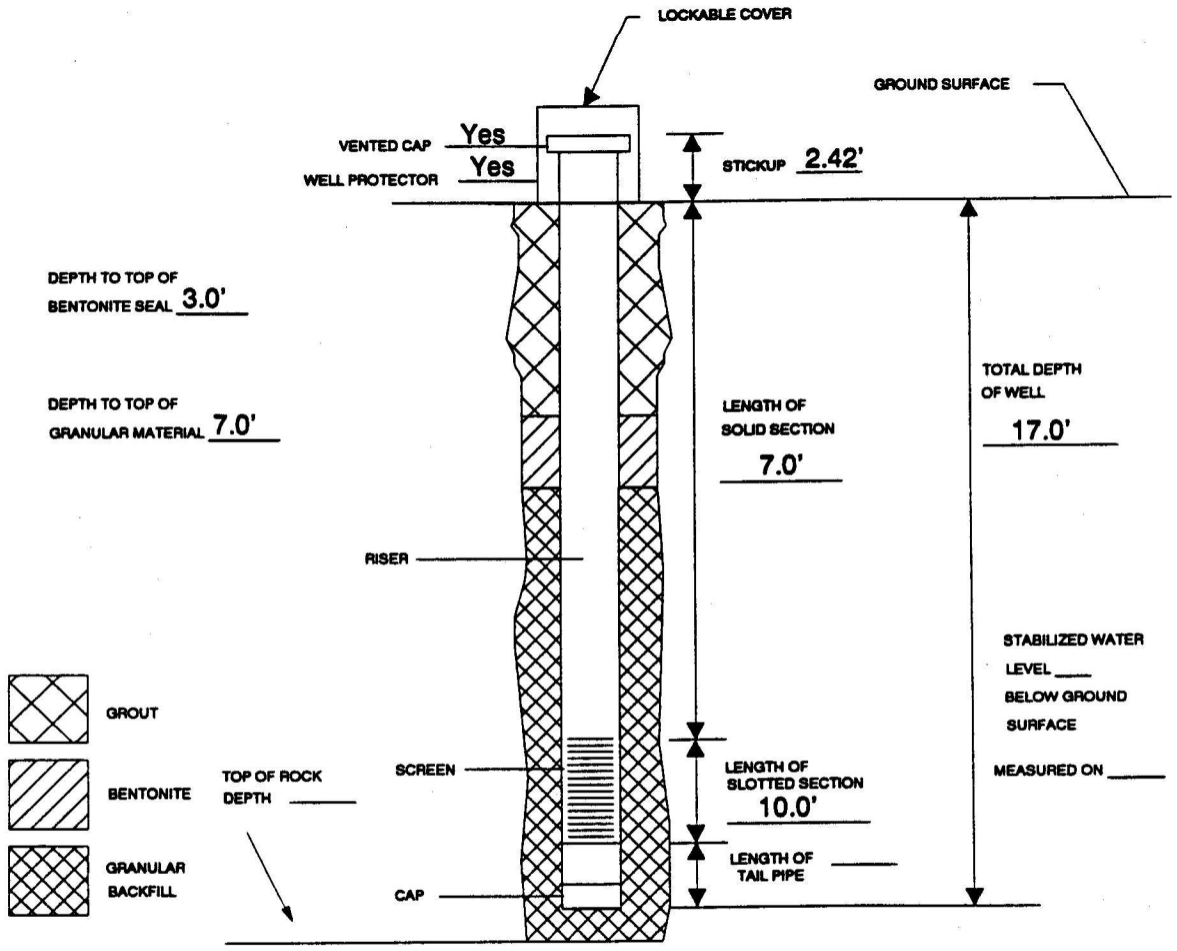
BOREHOLE DIAMETER: 8 1/4" | FIELD REPRESENTATIVE: T. Tomes

LOCKABLE COVER ?: Yes | FILTER CLOTH AROUND SCREEN ?: No

DRILLING FLUID: None

COMMENTS: Grout from surface to 3', 8 bags of 390 sand around screen, bentonite 3' to 5'

(NOT TO SCALE)



ENG LAB 5/4/89

Closed - 8/19/03 Monte Starks

MONITORING WELL INSTALLATION RECORD

PROJECT: Gallatin Fossil Fuel Plant

WELL NUMBER: Well 7 | INSTALLATION DATE: 9-18-89

PLANT COORDINATES: EAST 1879363.39 | NORTH 699746.08

GROUND SURFACE ELEVATION: 476.46' | TOP OF INNER CASING: 479.28'

GRANULAR BACKFILL MATERIAL: Sand, Bentonite & Grout | SLOT SIZE: 0.01"

CASING MATERIAL: 4" PVC | CASING DIAMETER: 4" PVC

DRILLING TECHNIQUE: Auger | DRILLING CONTRACTOR: Charlie Young

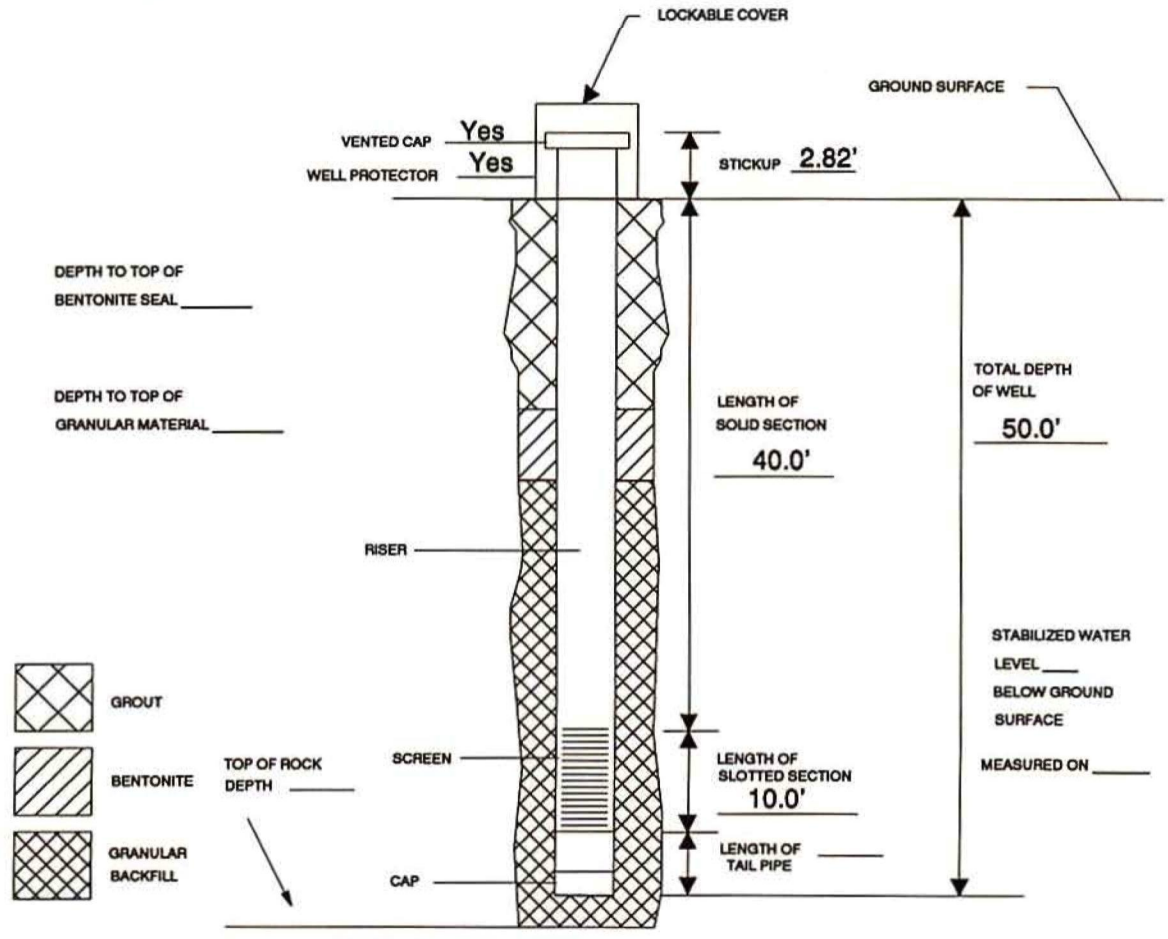
BOREHOLE DIAMETER: 8 1/4" | FIELD REPRESENTATIVE: T. Tomes

LOCKABLE COVER ?: Yes | FILTER CLOTH AROUND SCREEN ?: No

DRILLING FLUID: None

COMMENTS: Grout from surface to 35', 4.5 bags of 390 sand around screen, bentonite 35' to 37'

(NOT TO SCALE)



ENG LAB 5/4/89

Closed - 8/19/03
Monte Stratis

MONITORING WELL INSTALLATION RECORD

PROJECT: Gallatin Fossil Fuel Plant

WELL NUMBER: Well 8 | INSTALLATION DATE: 9-19-89

PLANT COORDINATES: EAST 1878553.32 | NORTH 701135.36

GROUND SURFACE ELEVATION: 472.08' | TOP OF CASING: 475.90' (Top of steel) *

GRANULAR BACKFILL MATERIAL: Sand, Bentonite & Grout | SLOT SIZE: 0.01"

CASING MATERIAL: 4" PVC | CASING DIAMETER: 2" PVC

DRILLING TECHNIQUE: Auger | DRILLING CONTRACTOR: Charlie Young

BOREHOLE DIAMETER: 8 1/4" | FIELD REPRESENTATIVE: T. Tomes

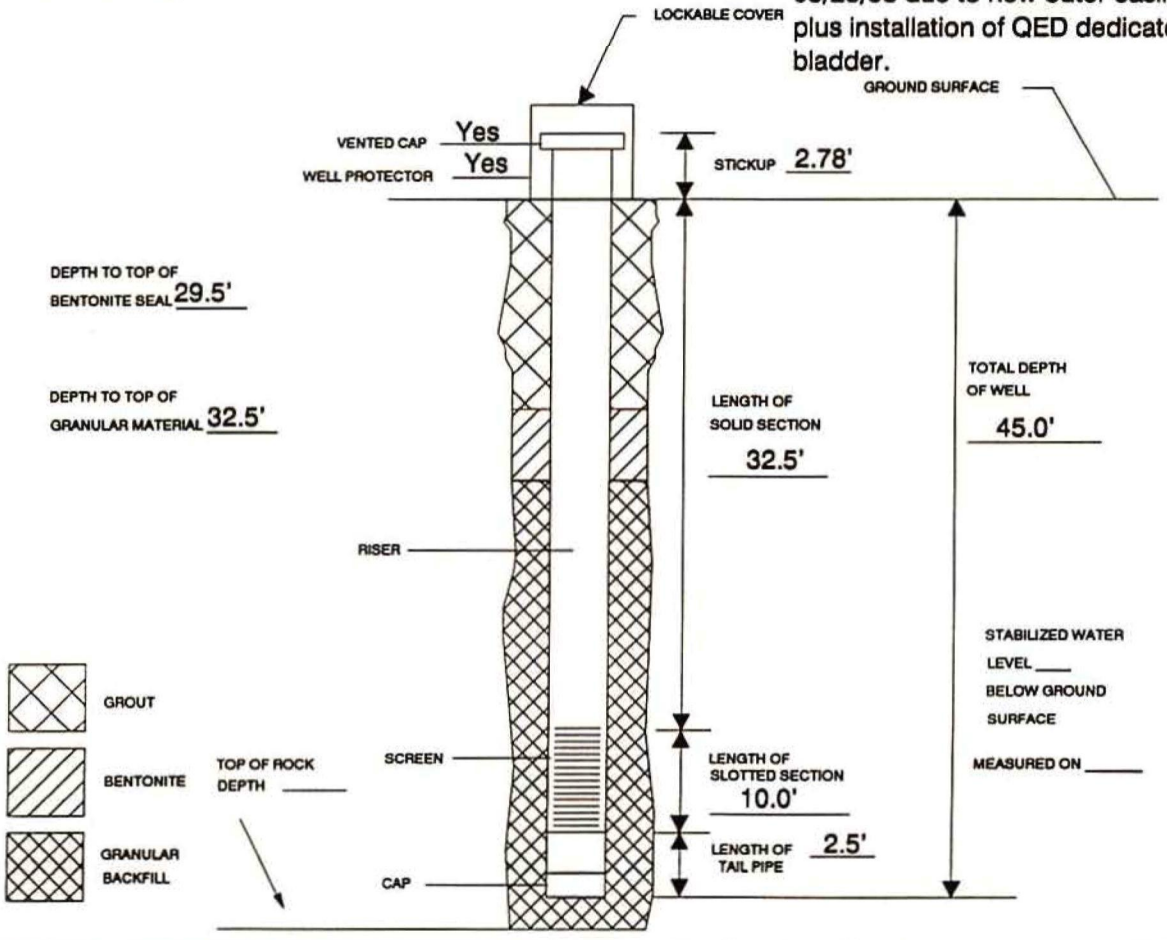
LOCKABLE COVER ?: Yes, 3/93 JCA | FILTER CLOTH AROUND SCREEN ?: No

DRILLING FLUID: None

COMMENTS: Grout from surface to 29.5', 8 bags of 390 sand around screen, bentonite 29.5'to 32.0'

(NOT TO SCALE)

* R.P. raised to Top of steel casing 03/25/93 due to new outer casing plus installation of QED dedicated bladder.



ENG LAB 5/4/89

Closed - 8/19/03 Monte Starks

MONITORING WELL INSTALLATION RECORD

PROJECT: Gallatin Fossil Fuel Plant

WELL NUMBER: Well 9

INSTALLATION DATE: 5-3-90

PLANT COORDINATES: EAST 1878583.48 NORTH 701073.93

Close to monitor well #8, next to river, thru gate 17

GROUND SURFACE ELEVATION: 472.39'

TOP OF INNER CASING: 474.85' (Top of PVC)

GRANULAR BACKFILL MATERIAL: Sand, Bentonite & Grout

SLOT SIZE: 0.01"

CASING MATERIAL: 2" PVC

CASING DIAMETER: 2" PVC

DRILLING TECHNIQUE: 4 1/4 HSA

DRILLING CONTRACTOR: Rob Tillery, Law Engineering

BOREHOLE DIAMETER: 8"

FIELD REPRESENTATIVE: Mel Wagner

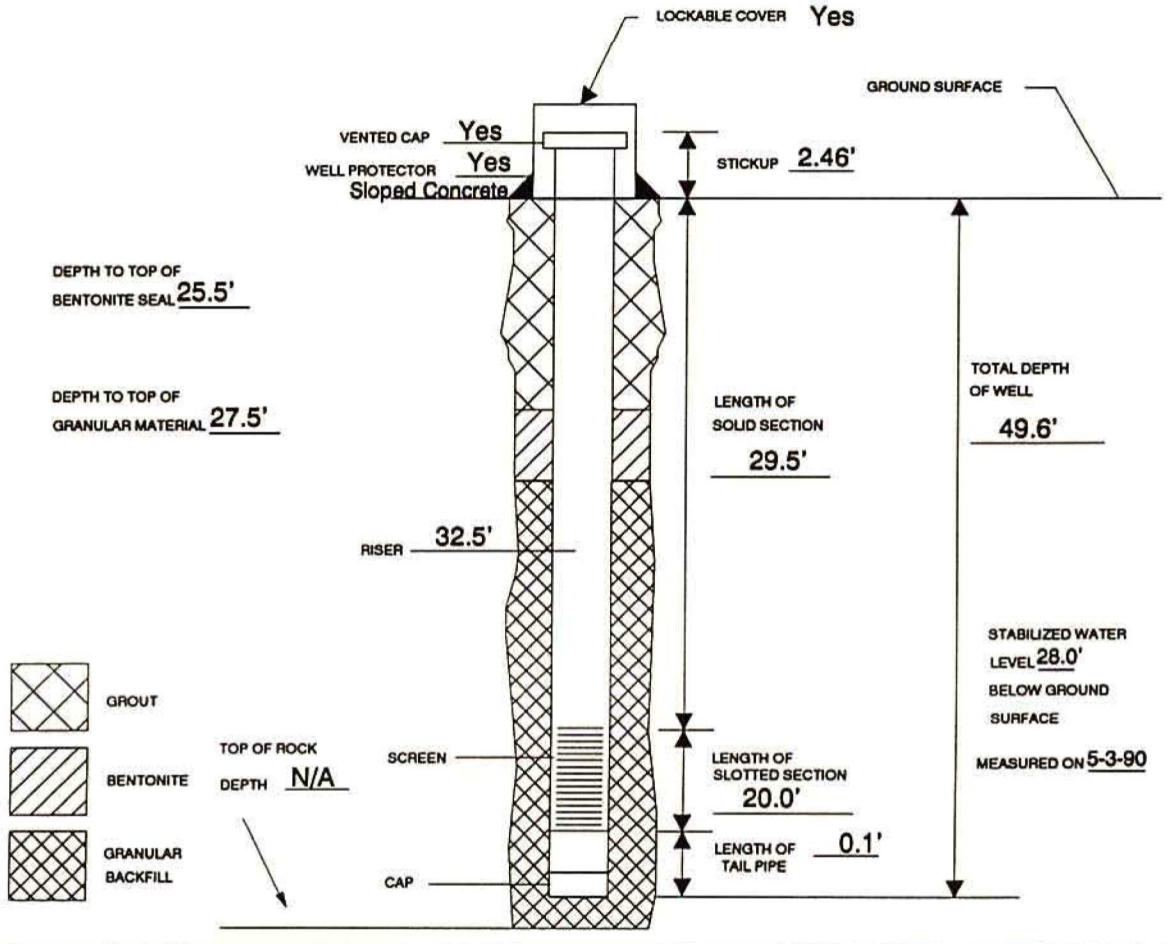
LOCKABLE COVER ?: Yes, 3/93 JCA

FILTER CLOTH AROUND SCREEN ?: No

DRILLING FLUID: None

COMMENTS: This well was developed with an air compressor.

(NOT TO SCALE)



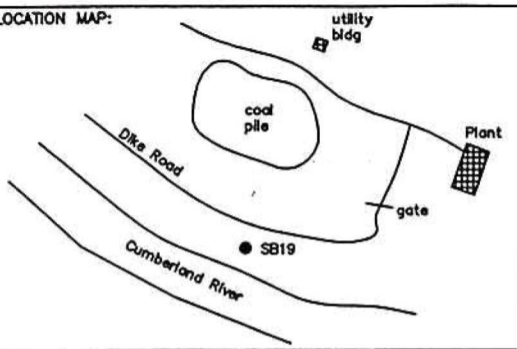
ENG LAB 5/4/89

FACILITY NAME: Gallatin Fossil Plant

FAC. ID#:

WELL #: 19 &/OR BORING #:

LOCATION MAP:



START DATE & TIME: 10-29-2000 1000

COMP. DATE & TIME: 10-29-2000 1930

LOGGED BY: J. A. Overton

DRILLER: A. Williams

DRILLING METHOD: 8 1/2" H.S. Auger

ELEV (MSL): 478.68 T.D. (MSL): 438.88

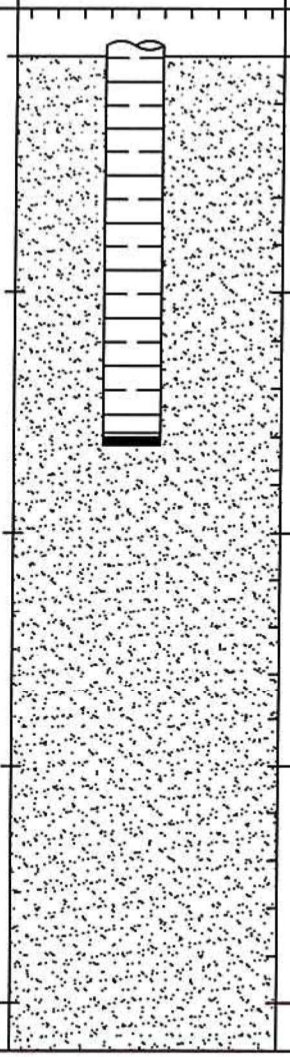
COMMENTS: -See bottom of page 2

PROJECT #:
Gallatin Fossil Plant
GW Well Installation

MSL	COMPLETION DIAGRAM / BOREHOLE DIAMETER:	WATER LEVEL	PENETRATION RATE	DEPTH	GRAPHIC LITHOLOGY	OVD	SAMPLES & CORES: TYPE	INT\REC	ANAL	DESCRIPTION (Color, Texture, Structur, etc.)
				0						Grout to surface
										0'–2' Topsoil with gravel
										2'–5' Soil, gravel, clay
				5						5'–35' Clay, orange/tan, moist
				10						
				15						
				20						
										24' Top of bentonite
				25						26' Top of sand
										28' Top of screen
				30						

FACILITY NAME: Gallatin Fossil Plant | TN FAC. ID#: | WELL#: 19 &/or BORING#: | pg 2 of 2

COMMENTS:



MSL	COMPLETION DIAGRAM / BOREHOLE DIAMETER:	WATER LEVEL	PENETRATION RATE	DEPTH	GRAPHIC LITHOLOGY	OVD	SAMPLES & CORES: TYPE	SAMPLES & CORES: INT./REC.	SAMPLES & CORES: ANAL.	DESCRIPTION (Color, Texture, Structure, etc...)
				30						32' H_2O
				35						35'–50' Orange/tan sandy clay saturated, very loose
										38' Bottom of screen
				40						
				45						
				50						50' Total depth

Comments

- –Soil description taken from augers.
- –Prepacked screen was used in well construction. A 2" OD, 0.01 slot screen was placed inside a 3 1/2" OD, 0.01 slot screen, then the area in between was filled with #1 filter sand and sealed.
- –All casing and screen are schedule 40 PVC.
- –Well completed with 4"x4"x5' steel well protector with lockable cover, and 3'x3" concrete pad.
- –Filter sand was injected into each well annulus filling from the bottom up.

Boring Log and Monitoring Well Construction Diagram

New Replacement Well

Project:	**TVA's Gallatin Fossil Plant Gallatin, Tennessee**	**BORING**	**MW-19R**
Project No.:	1432-05-671	**Elevation:**	Unknown
ged by:	R.L. Russell, R.G. (TN Reg. Geo. Lic. #4979)	**Depth:**	50'
ns:	S&ME, Inc. (Tim Hall - TN Driller #813)	**Start:**	September 19, 2005
Equipment:	CME 55 with 6 5/8" augers	**Complete:**	September 20, 2005

Notes: Descriptions based on visual observation of obtained samples.

Depth (ft)	Elevation (ft)	Lithology	Boring	Run Length	Recovered	% Recovered	RQD	Lithologic Description
1								Top of 6" vertical well box - 3 feet above ground surface Top of 2" dia. PVC casing - 2.5 feet above ground surface
0	Unknown							Ground Surface
1								**Clay** - silty, orange to orangish-brown, firm to stiff with cherty layers (0.0' - 22.0')
2								
3								
4								
5								
6								
7								
8								
9								
10								2" dia. PVC casing Grout
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								**Clay** - sandy-silty, red and tan (22.0' - 30.0')
23								
24								
25								
26								
27								
28								
29								
30								**Clay** - silty, dark brown (30.0' - 36.0')

S&ME

Boring Log and Monitoring Well Construction Diagram

Project:	**TVA's Gallatin Fossil Plant Gallatin, Tennessee**	**BORING**	**MW-19R**
Project No.:	1432-05-671	**Elevation:**	Unknown
ıged by:	R.L. Russell, R.G. (TN Reg. Geo. Lic. #4979)	**Depth:**	50'
ws:	S&ME, Inc. (Tim Hall - TN Driller #813)	**Start:**	September 19, 2005
Equipment:	CME 55 with 6 5/8" augers	**Complete:**	September 20, 2005

Notes: Descriptions based on visual observation of obtained samples.

Depth (ft)	Elevation (ft)	Lithology	Boring	Run Length	Recovered	% Recovered	RQD	Lithologic Description
31								
32								**Saturated Conditions at 32'**
33								
34								Hydrated bentonite seal
35								
36								
37								**Clay** - silty, tan to brown, soft, saturated (36.0' - 50.0')
38								
39								Sand filter
40								
41								
42								2" dia. PVC screen with pre-pack sand filter
43								
44								
45								
46								
47								
48								
49								
50								
51								**Boring Terminated** - bottom of boring at 50.0'
52								
53								
54								
55								
56								
57								
58								
59								
60								

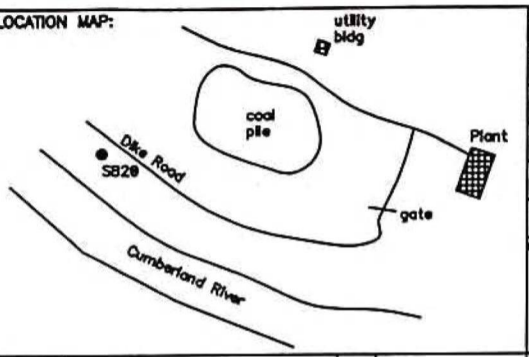
S&ME

FACILITY NAME: Gallatin Fossil Plant

FAC. ID#:

WELL #: 20 &/OR BORING #:

LOCATION MAP:



START DATE & TIME: 10-28-2000 1300

COMP. DATE & TIME: 10-29-2000 0930

LOGGED BY: J. A. Overton

DRILLER: A. Williams

DRILLING METHOD: 8 1/2" H.S. Auger

ELEV (MSL): 475.62 T.D. (MSL): 423.62

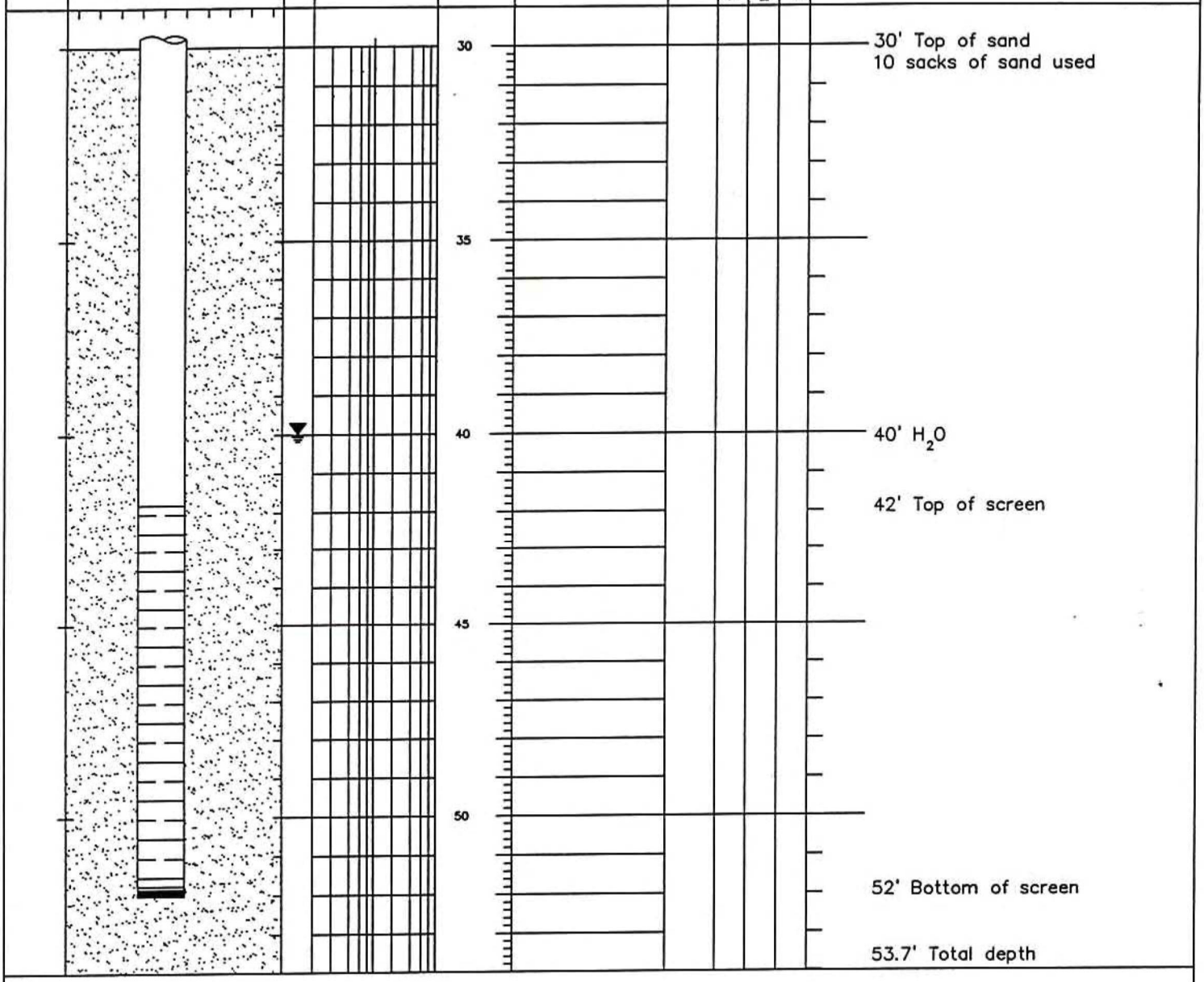
COMMENTS: -See bottom of page 2

PROJECT #:
Gallatin Fossil Plant
GW Well Installation

MSL	COMPLETION DIAGRAM / BOREHOLE DIAMETER:	WATER LEVEL	PENETRATION RATE	DEPTH	GRAPHIC LITHOLOGY	OVD	SAMPLES & CORES: TYPE	INT/REC	ANAL	DESCRIPTION (Color, Texture, Structur, etc.)
				0						Grout to surface 0'-3' Topsoil and gravel
				5						3'-13' Clay, orange/red, moist, firm
				10						13'-14' Clay with gravel/pebbles 14'-52' Clay, red, moist
				15						
				20						
				25						27' Top of bentonite
				30						

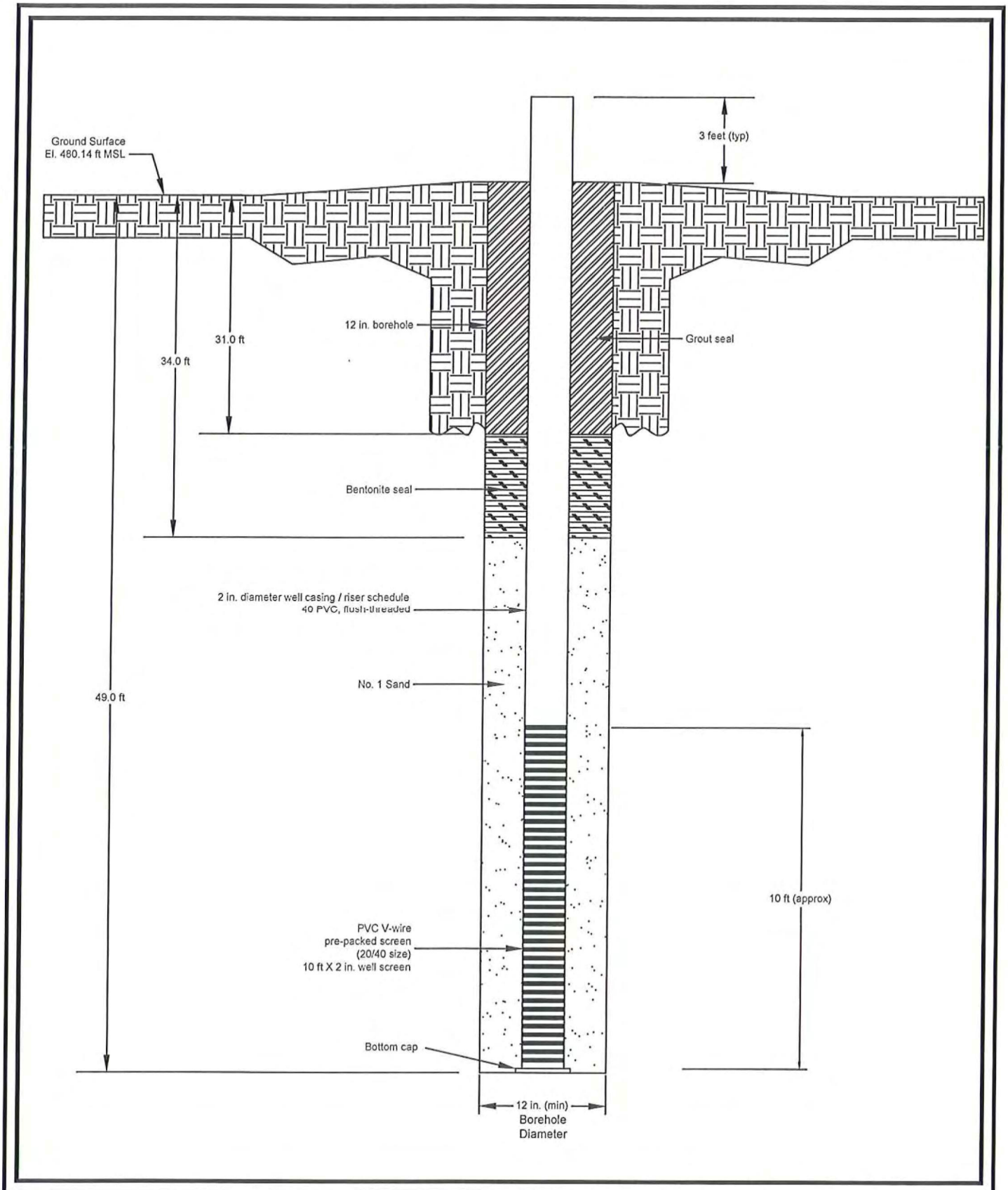
FACILITY NAME: Gallatin Fossil Plant | TN FAC. ID#: | WELL#: 20 &/or BORING#: | pg 2 of 2

COMMENTS:



Comments

- Soil description taken from augers.
- Prepacked screen was used in well construction. A 2" OD, 0.01 slot screen was placed inside a 3 1/2" OD, 0.01 slot screen, then the area in between was filled with #1 filter sand and sealed.
- All casing and screen are schedule 40 PVC.
- Well completed with 4"x4"x5' steel well protector with lockable cover, and 3'x3' concrete pad.
- Filter sand was injected into each well annulus filling from the bottom up.



ID: GAF-22	SCALE: N.T.S.	S&ME	**Monitoring Well Schematic**
	CHECKED BY: CTJ		TVA Gallatin Fossil Plant
	DRAWN BY: ACA		Monitoring Well Installation
Date Installed: 09/29/09	DATE: 10/06/09		Gallatin, Tennessee
			JOB NO: 1431-09-303

PROJECT: TVA-Gallatin Monitoring Well Installation Gallatin, Tennessee S&ME Project No. 1431-09-303	BORING LOG: **B-22**
DATE DRILLED: 9/29/09	ELEVATION: FEET
DRILLING METHOD: CME 550, 6¼" H.S.A.	BORING DEPTH: 49.0 FEET
LOGGED BY: N. Peterson	WATER LEVEL @ TOB: 25.0 feet
DRILLER: D. Hedges	WATER LEVEL @ 24 hrs: Not Obtained

NOTES: Soil descriptions based on visual observation of obtained samples. Boring drilled and sampled in preparation for installation of monitoring well GAF-22.

DEPTH (feet)	MATERIAL DESCRIPTION	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
	Crushed Stone, Topsoil, and Rootmat (1.5 feet)								
5	**CLAY (CH)**- Strong brown; moist; stiff; ALLUVIUM	1			4	5	6		11
10	**CLAYEY SAND (SC)**- Strong brown; moist; loose; ALLUVIUM	2			5	4	6		10
15		3			2	6	5		11
20	**CLAY (CH)**- With trace fine sand, rounded gravel, and chert fragments; dark yellowish brown to strong brown; moist to wet; stiff to very stiff; ALLUVIUM Note: Wet soil cuttings observed at approximately 25.0 feet	4			4	6	7		13
25	▽	5			3	7	10		17
30		6			4	5	7		12

BORING LOG - TVA 09-303.GPJ 10/8/09

NOTES:

1. *THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.*
2. *BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.*
3. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
4. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

S&ME

PROJECT: TVA-Gallatin Monitoring Well Installation Gallatin, Tennessee S&ME Project No. 1431-09-303	BORING LOG: B-22
DATE DRILLED: 9/29/09	ELEVATION: FEET
DRILLING METHOD: CME 550, 6¼" H.S.A.	BORING DEPTH: 49.0 FEET
LOGGED BY: N. Peterson	WATER LEVEL @ TOB: 25.0 feet
DRILLER: D. Hedges	WATER LEVEL @ 24 hrs: Not Obtained

NOTES: Soil descriptions based on visual observation of obtained samples. Boring drilled and sampled in preparation for installation of monitoring well GAF-22.

DEPTH (feet)	MATERIAL DESCRIPTION	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft)	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
35	**CLAY (CH)**- With trace fine sand, rounded gravel, and chert fragments; dark yellowish brown to strong brown; moist to wet; stiff to very stiff; ALLUVIUM	7			3	4	6		10
	Note: Wet soil cuttings observed at approximately 25.0 feet *(continued)*								
40	**CLAY (CH)**- With rounded gravel and trace fine sand; dark brown; wet; stiff; ALLUVIUM	8			2	5	7		12
45	**CLAY (CH)**- With rounded gravel; Dark yellowish brown with black oxide staining; wet; very stiff; ALLUVIUM	9			2	12	6		18
	LIMESTONE- Gray; very hard; dry	10		>>50/1"					50/ 1"
	Auger Refusal at 49.0 feet								

BORING LOG - TVA 09-303.GPJ 10/8/09

NOTES:

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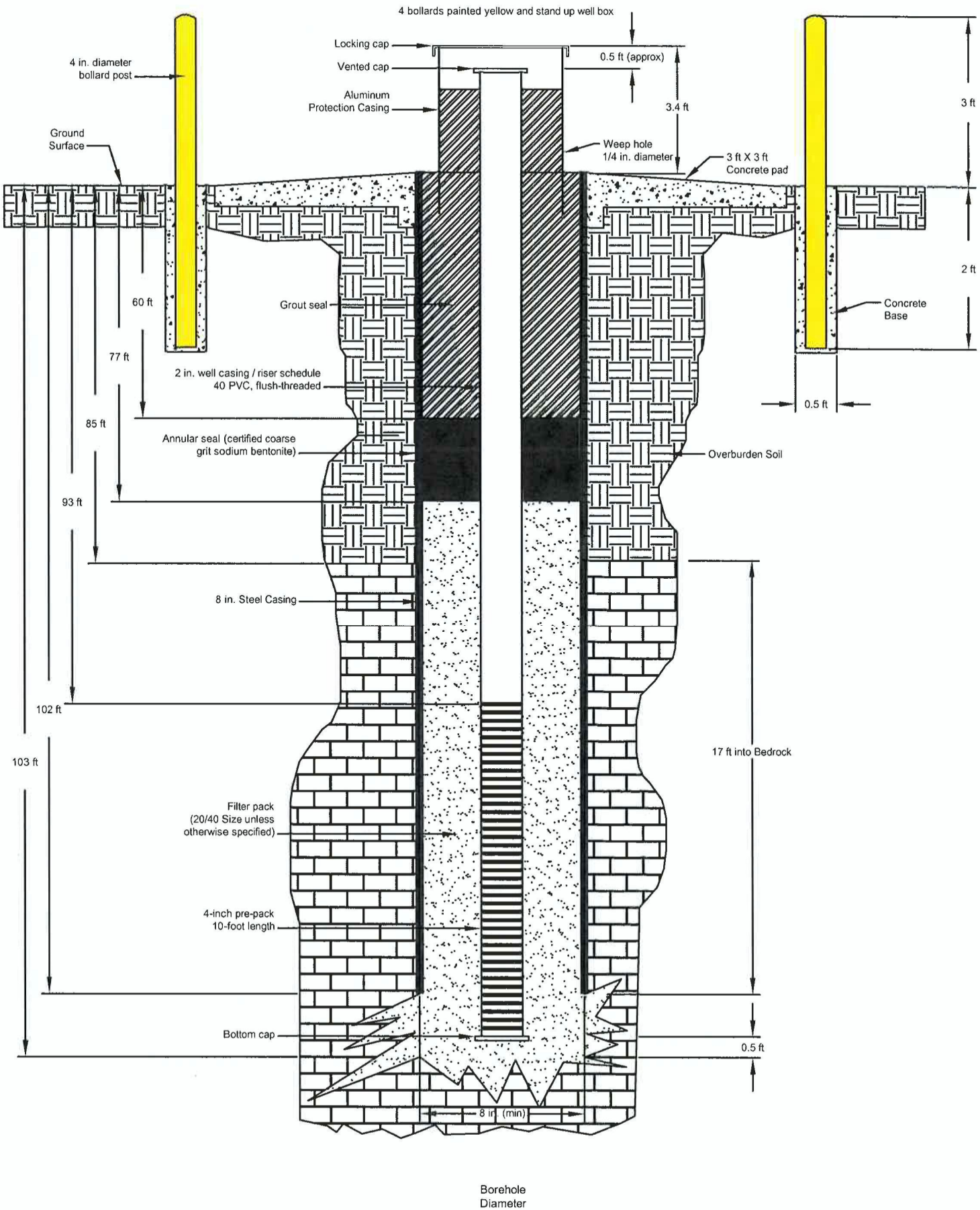
3. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
4. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

S&ME



TVA Well ID: R-3 well 26 Date Installed: 09-25-2011	SCALE: N.T.S. CHECKED BY: CTJ DRAWN BY: JHC DATE: 10-06-2011	S&ME	Bedrock Monitoring Well Schematic Monitoring Well Installation TVA Gallatin Fossil Plant Gallatin, Tennessee JOB NO: 1431-11-240

PROJECT:	BORING LOG:
TVA Gallatin **Gallatin, Tennessee** **S&ME Project No. 1431-11-240**	**R-3** well 26

DATE DRILLED: **9/13/11**	ELEVATION: FEET	NOTES: **Soil descriptions based on visual observation of obtained samples. Environmental sample collected from 41 to 43 feet.**
DRILLING METHOD: **CME 55, 3¼" H.S.A.**	BORING DEPTH: **63.0** FEET	
LOGGED BY: **TMD**	WATER LEVEL @ TOB: **50 feet**	
DRILLER: **D. Lowe**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
		Rootmat and topsoil (6 inches)										
5		**LEAN CLAY (CL) -** with fine gravel and black oxide staining; reddish brown and yellow brown; slightly moist; firm to stiff - FILL / POSSIBLE ALLUVIUM			1			5	4	5		9
10					2			2	4	5		9
15					3			2	2	3		5
20					4			4	6	7		13
25		**LEAN CLAY (CL)-** with fine grained sand; orange brown and yellow brown; moist; very soft to stiff - ALLUVIUM			5	UD-1 REC 90%		WH	1	1		2
30					6			5	6	7		13
		CLAYEY SAND (SC)- fine grained sand; orange brown; very moist to wet; loose to medium dense - ALLUVIUM			7			2	3	5		8

BORING LOG - TVA 11-240R.GPJ 11/10/11

NOTES:

1. *BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.*
2. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
3. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

S&ME

PROJECT:	BORING LOG:
TVA Gallatin **Gallatin, Tennessee** **S&ME Project No. 1431-11-240**	**R-3** well 26

DATE DRILLED: **9/13/11**	ELEVATION: FEET	NOTES: **Soil descriptions based on visual observation of obtained samples. Environmental sample collected from 41 to 43 feet.**
DRILLING METHOD: **CME 55, 3¼" H.S.A.**	BORING DEPTH: **63.0** FEET	
LOGGED BY: **TMD**	WATER LEVEL @ TOB: **50 feet**	
DRILLER: **D. Lowe**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. / SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
40		**CLAYEY SAND (SC)-** fine grained sand; orange brown; very moist to wet; loose to medium dense - ALLUVIUM *(continued)*			8		2	3	4		7
45					9		7	9	10		19
50			▽		10		4	5	10		15
55		**SANDY CLAY (CL)-** with fine grained sand and rounded gravel; orange brown, brown and gray; very moist to wet; very stiff - ALLUVIUM			11		2	6	7		13
60					12		2	6	13		19
					13		7	8	9		17
		Auger Refusal Encountered at 63.0 Feet.			14	>>	6	11	50/4		50/4

BORING LOG - TVA 11-240R.GPJ 11/10/11

NOTES:

1. *BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.*
2. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
3. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

S&ME

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ENVIRONMENTAL
TEST BORING FIELD REPORT

Job Name TVA Gallatin Job No. 1431-11-240

Field Supervisor DeVoe Crew Miller / Buddy Hrs. Drilling ____ Hrs. Moving ____ Boring # R-3 offset

Date 9/24/11 Weather ____ Ground Surface Elevation ____ [3rd offset]
9/25/11

Soil Strata					Sampling/Blows per Ft.			Monitoring	
From	To	Soil Description and Remarks	No.	Depth	1st 6"	2nd 6"	3rd 6"	OVA	CH4
0	85'	overburden							
		- advance 8-inch ODEX casing advancer							
85	87.5'	limestone, fine-grained, well sorted,							
		blue-gray, crystalline							
87.5'	90'	weathered rock lenses and mud seams;							
		voids							
90'	97'	back on good limestone							
97'	102'	voids, mud seams and thin rock							
		lenses							
102'	103'	rock / set well bottom on rock							
		bottom of screen at 103'							
		sand up to 77' (after developing well) then add bentonite seal							
		bentonite up to 67'							

Water Level ____ at TOB

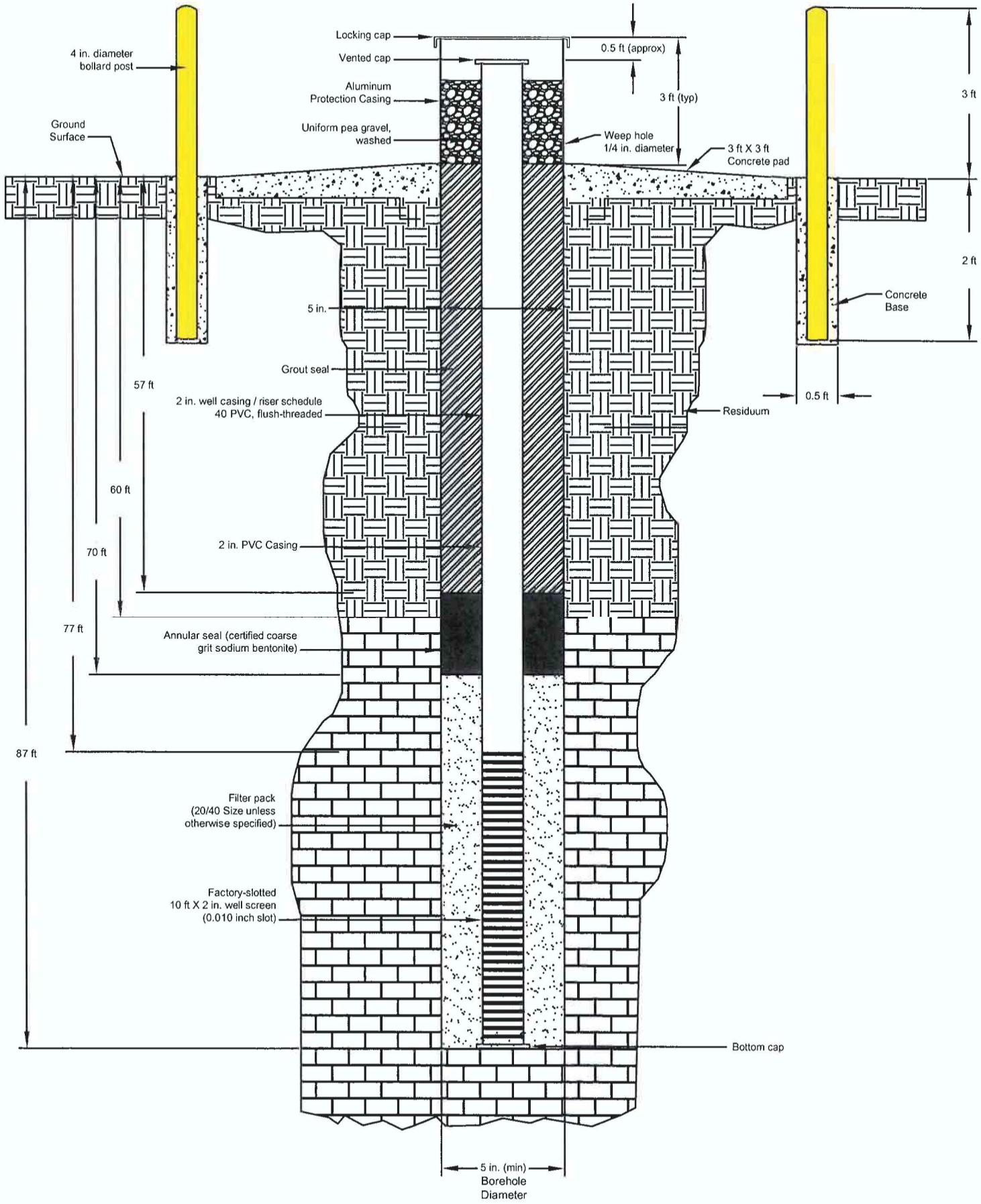
Water Level ____ at ____

Water Level ____ at 24 Hours

Water Losses ____

Casing, Size ____ Length ____

Note: (Record Methods of Drilling & Depths)



TVA Well ID: R-2 well 27 Date Installed: 10/26/2011	SCALE: N.T.S. CHECKED BY: CTJ DRAWN BY: JHC DATE: 10-31-2011	S&ME	Bedrock Monitoring Well Schematic Monitoring Well Installation TVA Gallatin Fossil Plant Gallatin, Tennessee JOB NO: 1431-11-240

PROJECT:	BORING LOG:
TVA Gallatin **Gallatin, Tennessee** **S&ME Project No. 1431-11-240**	**R-2** well 27

DATE DRILLED: **9/14/11**	ELEVATION: FEET	NOTES: **Soil descriptions based on visual observation of obtained samples. Environmental samples collected from 26 to 28 ft, 36 to 38 ft, and 51 to 53 ft.**
DRILLING METHOD: **CME 55, 3¼" H.S.A.**	BORING DEPTH: **87.0** FEET	
LOGGED BY: **TMD**	WATER LEVEL @ TOB: **49 feet**	
DRILLER: **D. Lowe**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
0		Rootmat and topsoil (6 inches)										
5		**FAT CLAY (CH)-** with rounded gravel; trace fine sand; yellow brown to tan; slightly moist; firm - FILL / POSSIBLE ALLUVIUM			1	SS		4	4	4		8
10					2	SS		2	2	4		6
15					3	SS		3	3	7		10
20		**LEAN CLAY (CL)-** with rounded gravel and fine sand; trace manganese nodules; yellow brown to reddish brown; slightly moist to moist; stiff to very stiff - ALLUVIUM			4	SS		1	3	6		9
25					5	SS		7	10	12		22
30					6	SS		3	5	7		12
35		**FAT CLAY (CH)-** with manganese nodules; trace silt; brown; moist; very soft - ALLUVIUM			7	SS		0	0	2		2
40		**FAT CLAY WITH GRAVEL (CH)-** with manganese nodules; trace fine sand; tan to light brown with gray silt lenses; stiff to very stiff; moist - ALLUVIUM			8	SS		11	13	13		26
					9	SS		6	6	8		14

BORING LOG - TVA 11-240R.GPJ 11/10/11

NOTES:

1. *BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.*
2. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
3. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

S&ME

PROJECT:	BORING LOG:
TVA Gallatin **Gallatin, Tennessee** **S&ME Project No. 1431-11-240**	**R-2** well 27

DATE DRILLED: **9/14/11**	ELEVATION: FEET	NOTES: **Soil descriptions based on visual observation of obtained samples. Environmental samples collected from 26 to 28 ft, 36 to 38 ft, and 51 to 53 ft.**
DRILLING METHOD: **CME 55, 3¼" H.S.A.**	BORING DEPTH: **87.0** FEET	
LOGGED BY: **TMD**	WATER LEVEL @ TOB: **49 feet**	
DRILLER: **D. Lowe**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	MATERIAL DESCRIPTION	SAMPLE NO. / SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
50	**FAT CLAY WITH GRAVEL (CH)-** with manganese nodules; trace fine sand; tan to light brown with gray silt lenses; stiff to very stiff; moist - ALLUVIUM *(continued)*	UD-1 REC 100% 10		5	6	9		15
55	**FAT CLAY (CH)-** trace fine sand; trace silt; light brown; wet; stiff - ALLUVIUM	11		3	5	5		10
60	Auger Refusal Encountered at 60.5 Feet. Reamed PW Casing to 61.0 feet. Began PQ Coring at 60.0 feet.	12 R1 REC 100% RQD 0%		3	4	5		9
65	**LIMESTONE** - From 60.0 to 72.0 feet bluish gray; medium to coarse-grained; poorly sorted; highly fossiliferous; slightly weathered; hard. Bedding is at an apparent dip of 0 to 5 degrees. Bedding plane features and vertical joints observed throughout with frequency decreasing with depth. Several weathered bedding seams mostly infilled with clay observed from about 60.0 to 62.0 feet. The frequency of the weathered bedding seams occur every 0.2 to 0.3 feet. Very thin gray shale seams present and associated with bedding. Joint surfaces are slightly weathered. From 62.0 to 72.0 feet fewer weathered bedding seams; no clay filling.	R2 REC 100% RQD 63%						
70		R3 REC 100% RQD 92%						
75		R4 REC 100% RQD 100%						
80	**LIMESTONE** - From 72.0 to 87.0 feet bluish gray; fine-grained; well sorted; very slightly weathered; hard. Bedding is at an apparent dip of 0 to 5 degrees. Very thin gray shale seams present and associated with bedding.	R5 REC 100% RQD 99%						
85	PQ Coring Terminated at a depth of 87.0 feet.	R6 REC 100% RQD 86%						

BORING LOG - TVA 11-240R.GPJ 11/10/11

NOTES:

1. *BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.*
2. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
3. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

S&ME

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-438L

Sheet 1 of 3

Date(s) Drilled	**1/4/17 to 1/9/17**	Logged By	**E. House**	Checked By	**C. Scheip**
Drilling Method	**Rotosonic**	Drill Bit Size/Type	**Nominal 4", 6", 7" (Sonic)**	Total Depth of Borehole	**140.0 feet**
Drill Rig Type	**TSi 150CC SONIC Rig (Compact Crawler)**	Drilling Contractor	**Cascade**	Surface Elevation	**499.14 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 1/12/17 (Formerly GAP038-L)**	Sampling Method(s)	**6-inch sonic**	Hammer Data	**N/A**
Coordinate Location	**N 701,590.8 E 1,879,533.5**	Groundwater Level(s)	**16.9 ft bgs on 01/18/17**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											Top of Casing 501.61 msl
499.1	0							Strong brown silty CLAY with some chert and limestone fragments, Friable, Dry			2" Diameter PVC Riser (0'-119' bgs)
495	5	SONIC	1		100						
490	10							@ 10' bgs Chert nodules becoming more abundant			Bentonite Seal (0'-117' bgs)
485	15	SONIC	2		90						
								@ 17' bgs Drilling rate decreases	▽		
480	20	SONIC	3		100						
475.1	24.0							Gray to light gray very broken biomicritic LIMESTONE Bedrock, Hard			
475	25	SONIC	4		100						
470	30							@ 30' bgs Medium gray very broken biomicritic LIMESTONE Bedrock, Hard			
465	35	SONIC	5		100						
460	40										
455	45	SONIC	6		73						
450	50							@ 50' bgs Medium gray very broken LIMESTONE Bedrock with trace of mudstone, Hard, Light gray water returning to surface			
445	55	SONIC	7		84						
440	60							[57.5' bgs Weathered fractured zone]			

Report: GEO_CR_WELL; File \\10.73.7.1\SHARED\TVA CCP\GAF\EIP\GAF EIP TASK 1A WELL INSTALLATION.GPJ; 4/25/2017 11:16:01 AM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-438L

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
440	60							Medium gray very broken LIMESTONE Bedrock with trace of mudstone, Hard			2" Diameter PVC Riser (0'-119' bgs)
435	65	SONIC	8		88						
430	70										Bentonite Seal (0'-117' bgs)
425	75	SONIC	9		85			@ 74' bgs Slight loss of water returning to surface			
420	80										
415	85	SONIC	10		97			[87' bgs Weathered fracture]			
410	90						409.1	@ 88.5'-89' bgs Small granular crushed rock 90.0			
405	95	SONIC	11		100			Medium gray LIMESTONE Bedrock, Very Hard			
400	100							@ 99'-100' bgs Small granular crushed rock			
395	105	SONIC	12		100			[104.1' bgs Weathered fracture]			
390	110							[106.9' bgs Weathered fracture] [107.8' bgs Weathered fracture]			
385	115	SONIC	13		100						
380	120										Sand Pack #2 (117'-133' bgs)
375	125	SONIC	14		100						0.010 Slot 2" Diameter PVC Screen (119'-129' bgs)
370	130							@ 129.6'-130' bgs Smaller rock fragments, Friable			Solid PVC End Cap

Report: GEO_CR_WELL; File \\10.73.7.1\SHARED\TVA CCP\GAF\EIP\GAF EIP TASK 1A WELL INSTALLATION.GPJ; 4/25/2017 11:16:01 AM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-438L

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
365	135	SONIC	15		100			Medium gray LIMESTONE Bedrock, Very Hard			Sand Pack #2 (117'-133' bgs)
360	140							359.1 140.0			Bentonite Backfill (133'-136' bgs)
355	145							End of Boring at 140´ bgs			Natural Collapse (136'-140' bgs)
350	150										
345	155										
340	160										
335	165										
330	170										
325	175										
320	180										
315	185										
310	190										
305	195										
300	200										

Report: GEO_CR_WELL; File \\10.73.7.1\SHARED\TVA CCP\GAF\EIP\GAF EIP TASK 1A WELL INSTALLATION.GPJ; 4/25/2017 11:16:01 AM

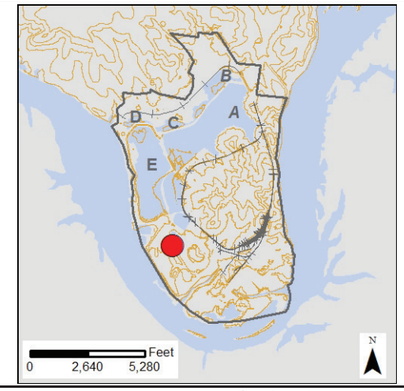
GEOPHYSICAL RECORD OF BOREHOLE: GAP038-L

Ash Pond Complex Groundwater Characterization
Gallatin Fossil Plant
Tennessee Valley Authority

AECOM

Project Number: 60513955

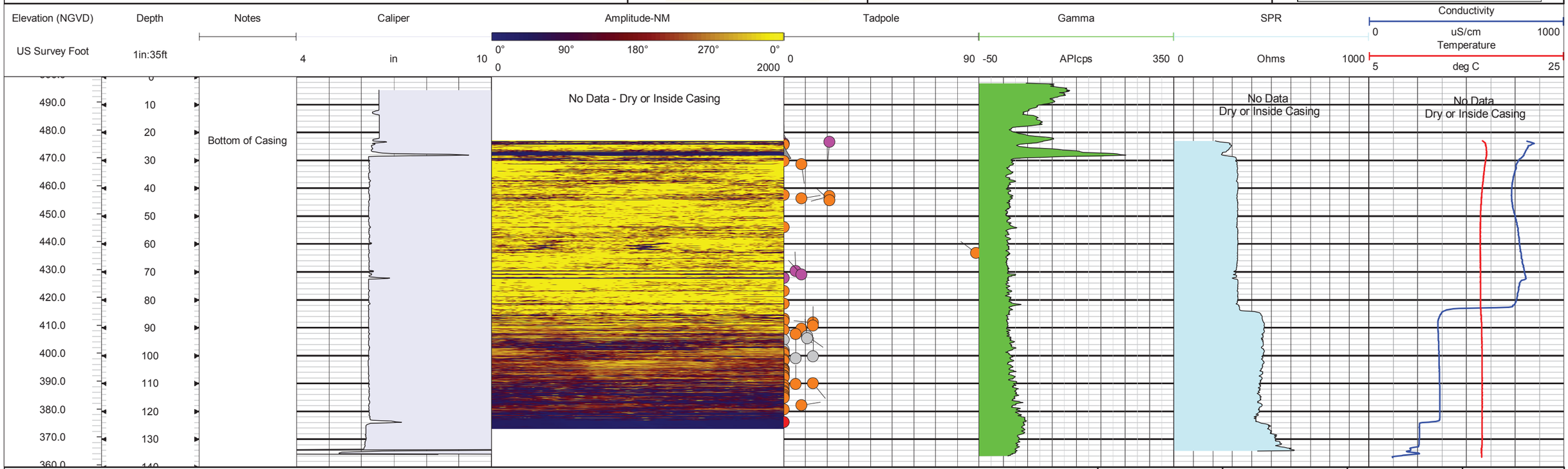
Date: 01/11/2017



Datum: GAF-Plant Local	Depth Reference : Ground Surface	Drill Comp Date: 12/09/2016	
Easting: 1879533.5	Drilling Method : Rotosonic	Casing Stick-up: 0 ft ags at time of logging	Location: Gallatin, Tn
Northing: 701590.8	Borehole Size: Nominal 6 in	Casing Diameter: 7 in	Log Date: 01/10-11/2017
Ground Elev msl: 499.14	Drilled Depth: 140	Casing Depth: 23 ft bgs	Logged By: Jonathan Moskal and Jonathan Whitley

0 - Broken Zone / Undifferentiated
1 - Major Open Joint / Fracture
2 - Minor Open Joint / Fracture
3 - Partially Open Joint / Fracture
4 - Filled Fracture / Joint

Notes:
Water Level Recorded: 22.80 ft bgs prior to logging



GAP038-L Composite plot of all geophysical logs

AECOM	Prepared By JWW	Date 01/11/2017	FIGURE
	Reviewed By	Date	REV 1

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-439A

Sheet 1 of 1

Date(s) Drilled	**12/15/16**	Logged By	**E. House**	Checked By	**M. Friedman**
Drilling Method	**HSA**	Drill Bit Size/Type	**6.25" ID HSA**	Total Depth of Borehole	**20.5 feet**
Drill Rig Type	**CME-55**	Drilling Contractor	**Tri-State Drilling, LLC**	Surface Elevation	**472.2 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 12/15/16**	Sampling Method(s)	**No samples collected**	Hammer Data	**DTH Hammer**
Coordinate Location	**N 700,757.0 E 1,879,341.9**	Groundwater Level(s)	**6.1 ft bgs during drilling**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES Recovery, %	SAMPLES Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											TOC = 474.94 ft msl
472.2	0.0										
								Log from 0'-20.5' based on GAP039-D.			
								@ 0'-0.5' bgs Top soil			
								@ 0.5'-20.5' bgs Fine grained sand (ASH)			
470	0		1		60						**Bentonite Grout (0'-6' bgs)**
											2" Diameter PVC Riser (0'-10' bgs)
	5										
465			2		100			@ 6.1' bgs Saturated			**Bentonite Seal (6'-8' bgs)**
	10										
460			3		100						**Sand Pack #2 (8'-20.5' bgs)**
	15										**0.010 Slot 2" Diameter PVC Screen (10'-20' bgs)**
455			4		100						
451.7	20								20.5		**Solid PVC End Cap**
450								End of Boring at 20.5´ bgs			
	25										
445											
	30										
440											
	35										
435											
	40										

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/17/2017 10:35:47 AM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-439U

Sheet 1 of 1

Date(s) Drilled	**12/15/16, 12/19/16**	Logged By	**N. Shore**	Checked By	**M. Friedman**
Drilling Method	**HSA**	Drill Bit Size/Type	**10" ID HSA / 4.25" ID HSA**	Total Depth of Borehole	**34.5 feet**
Drill Rig Type	**CME-55**	Drilling Contractor	**Tri-State Drilling, LLC**	Surface Elevation	**472.1 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 1/5/17**	Sampling Method(s)	**2-inch sampler**	Hammer Data	**DTH Hammer**
Coordinate Location	**N 700,761.9 E 1,879,347.8**	Groundwater Level(s)			

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											TOC = 475.10 ft msl
	0							472.1 0.0 Log from 0'-34.5' based on GAP039-D. @ 0'-0.5' bgs Top Soil @ 0.5'-27' bgs Fine grained sand (ASH)			**Bentonite Grout (0'-25' bgs)**
470			1		60						**2" Diameter PVC Riser (0'-29.5' bgs)**
	5							@ 6.1' bgs Satruated			
465			2		100						
	10										
460			3		100						
	15										
455			4		100						
	20										
450			5		100						
	25										*8-inch PVC casing set @ 24' bgs*
											Bentonite Seal (25'-27' bgs)
445			6		100			445.1 27.0 @ 27'-34' bgs Brown/gray CLAY, stiff, moist			**Sand Pack #2 (27'-34.5' bgs)**
	30										**0.010 Slot 2" Diameter PVC Screen (29.5'-34.5' bgs)**
440			7		100						
								437.6 Auger refusal, partially weathered rock 34.5			**Solid PVC End Cap**
	35							End of Boring at 34.5´ bgs			
435											
	40										

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/11/2017 11:36:37 AM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-440A

Sheet 1 of 1

Date(s) Drilled	**12/14/16**	Logged By	**J. Hamela**	Checked By	**M. Friedman**
Drilling Method	**HSA**	Drill Bit Size/Type	**6.25" ID HSA**	Total Depth of Borehole	**15.0 feet**
Drill Rig Type	**CME-55**	Drilling Contractor	**Tri-State Drilling, LLC**	Surface Elevation	**500.9 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 12/14/16, abandoned 1/16/17**	Sampling Method(s)	**None**	Hammer Data	**DTH Hammer**
Coordinate Location	**N 700,770.2 E 1,879,919.1**	Groundwater Level(s)	**10.5 ft bgs on 12/9/16**		

Elevation, feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											TOC = 503.76 ft msl
500	0							500.9 0.0 Log from 0'-15' based on GAP040-D. Strong brown silty CLAY with sand and rock fragments, Well graded, Dry			**Bentonite Grout (0'-15' bgs)**
			1					498.3 2.6 Very dark gray coal ASH with silty sand, Medium to fine grained, Well graded, Dry			
495	5		2					@ 5'-10.5' bgs Black, Medium to coarse grained, Well graded, Dry			
490	10		3					@ 10.5'-15' bgs Black, Medium to coarse grained, Moderately graded, Saturated			
485	15							485.9 15.0 End of Boring at 15´ bgs			
480	20										
475	25										
470	30										
465	35										
	40										

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/11/2017 11:36:38 AM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-440AR

Sheet 1 of 1

Date(s) Drilled	**1/10/17**	Logged By	**K. Owens**	Checked By	**M. Friedman**
Drilling Method	**HSA**	Drill Bit Size/Type	**6.25" ID HSA**	Total Depth of Borehole	**21.0 feet**
Drill Rig Type	**CME-55**	Drilling Contractor	**Tri-State Drilling, LLC**	Surface Elevation	**501.0 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 1/10/17**	Sampling Method(s)	**None**	Hammer Data	**DTH Hammer**
Coordinate Location	**N 700,787.5 E 1,879,910.4**	Groundwater Level(s)			

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											TOC = 503.83 ft msl
501.0	0.0							Log from 0'-15' based on GAP040-D. Strong brown silty CLAY with sand and rock fragments, Well graded, Dry			**Bentonite Grout (0'-3' bgs)**
498.4	2.6							Very dark gray coal ASH with silty sand, Medium to fine grained, Well graded, Dry			**2" Diameter PVC Riser (0'-10' bgs)**
495	5							@ 5'-10.5' bgs Black, Medium to coarse grained, Well graded, Dry			**Bentonite Seal (3'-8' bgs)**
											Sand Pack #2 (8'-21' bgs)
490	10							@ 10.5'-15' bgs Black, Medium to coarse grained, Moderately graded, Saturated			
485	15							@ 15'-20' bgs Dark green-gray ASH, Wet			**0.010 Slot 2" Diameter PVC Screen (10'-20' bgs)**
481.0	20.0										**Solid PVC End Cap**
480.0	21.0							@ 20'-21' bgs Brown CLAY, Soft			
480								End of Boring at 21´ bgs			
475	25										
470	30										
465	35										
	40										

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/11/2017 11:36:40 AM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-440U

Date(s) Drilled	**12/13/16 to 12/21/16**	Logged By	**J. Hamela, E. House**	Checked By	**M. Friedman**
Drilling Method	**HSA**	Drill Bit Size/Type	**10" ID HSA / 4.25" ID HSA**	Total Depth of Borehole	**53.0 feet**
Drill Rig Type	**CME-55**	Drilling Contractor	**Tri-State Drilling, LLC**	Surface Elevation	**501.1 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 12/21/16**	Sampling Method(s)	**2-inch sampler**	Hammer Data	**DTH Hammer**
Coordinate Location	**N 700,779.7 E 1,879,914.5**	Groundwater Level(s)			

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
								501.1 / 0.0			*TOC = 503.82 ft msl*
500	0		1					Log from 0'-20.0' based on GAP040-D. Strong brown silty CLAY with sand and rock fragments, Well graded, Dry			**Bentonite Grout (0'-37' bgs)**
								498.5 / 2.6			
								Very dark gray coal ASH with silty sand, Medium to fine grained, Well graded, Dry			
495	5		2					@ 5'-10.5' bgs Black, Medium to coarse grained, Well graded, Dry			**2" Diameter PVC Riser (0'-41' bgs)**
490	10		3					@ 10.5'-19.8' bgs Black, Medium to coarse grained, Moderately graded, Saturated			
485	15		4								
								481.3 / 19.8			
480	20		5					Strong brown silty CLAY with sand, Sticky, Plastic, Saturated			
			6		100			@ 22'-29' bgs Yellowish red silty CLAY with partially weathered rock fragments, hard, gravel-sized nodules, and weathered micas			*8-inch PVC casing set @ 22' bgs*
475	25		7		100			@ 29' bgs Probe refusal			
								472.1 / 29.0			
470	30		1		10			Strong brown CLAY with rock fragments, Highly plastic, Stiff, Moist			
			2		20			@ 31' bgs Firm, Dry			
			3		100			@ 33' bgs Reddish yellow CLAY, Highly plastic, Stiff, Dry			
465	35		4		100			@ 35' bgs Reddish yellow silty CLAY, Moderately plastic, Stiff, Dry			
								464.1 / 37.0			
			5		80			Reddish yellow silty CLAY, Stiff, Dry			**Bentonite Seal (37'-39' bgs)**
	40		6		30			@ 39' bgs Brownish yellow silty CLAY, Moderately			**Sand Pack #2**

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/17/2017 10:35:49 AM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-440U

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
460	40		6		30			plastic, Stiff, Dry			(39'-51.5' bgs)
			7		100						
			8		85						0.010 Slot 2" Diameter PVC Screen (41'-51' bgs)
455	45		9		100			@ 45' bgs Strong brown silty CLAY with trace of sand, Firm, Dry			
			10		65						
450	50		11		100			Strong brown silty CLAY with rock fragments, Firm, Damp			Solid PVC End Cap
			12		100			@ 51.9' bgs Auger refusal			Natural Collapse (51.5'-53' bgs)
448.1								@ 51.9'-53' bgs rock fragments becoming more abundant, Fractured bedrock	53.0		
445	55							End of Boring at 53´ bgs			
440	60										
435	65										
430	70										
425	75										
420	80										
415	85										

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/17/2017 10:35:49 AM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-441L

Sheet 1 of 3

Date(s) Drilled	8/1/16 to 8/9/16	Logged By	D. Mihalek	Checked By	C. Scheip
Drilling Method	Air Hammer/HSA	Drill Bit Size/Type	DTH Hammer	Total Depth of Borehole	135.0 feet
Drill Rig Type	Geoprobe 8040DT	Drilling Contractor	Geologic Exploration	Surface Elevation	501.06 ft above msl
Borehole Backfill	Monitoring Well- Installed 8/23/16 (Formerly GAP041-L)	Sampling Method(s)	None	Hammer Data	12" (HSA)/8"
Coordinate Location	N 700,480.1 E 1,880,449.0	Groundwater Level(s)	15.7 ft bgs/485.4 msl on 10/19/16		

Elevation, feet	Depth, feet	SAMPLES: Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											Top of Casing 504.08 msl
500	0		1					501.1 0.0 Dark brown CLAY, Medium soft, Medium plasticity, Damp			Portland Grout (0'-73' bgs)
495	5		2								
490	10		3								2" Diameter PVC Riser (0'-84' bgs)
485	15		4								
480	20		5								
475	25		6								
470	30		7								
465	35		8					@ 35' bgs Water returning to surface 466.1 35.0 Orange CLAY, Soft, Low plasticity, Saturated			
460	40		9								
455	45		10								
450	50		11								
445	55		12								
	60										

AECOM

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Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-441L

Elevation, feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
440	60							Orange CLAY, Soft, Low plasticity, Saturated			Portland Grout (0'-73' bgs)
			13								
435	65										
			14					@ 68' bgs Apparent voids encountered			
430	70		15								2" Diameter PVC Riser (0'-84' bgs)
								429.1 72.0			
425	75							LIMESTONE Bedrock @ 72' bgs Changed to air rotary drilling @ 75' bgs Gray to dark gray LIMESTONE Bedrock with quartz veins @ 78' bgs 6-inch PVC Casing Set			Bentonite Seal (73'-80' bgs)
420	80										Sand Pack #2 (80'-99.5' bgs)
415	85										
410	90										0.010 Slot 2" Diameter PVC Screen (84'-99' bgs)
405	95										
								404.1 97.0			
	100							Brownish orange CLAY, Very soft, Medium plasticity, Saturated			Solid PVC End Cap
400											*Borehole collapsed at 99.5' bgs after drilling*
	105										
395								395.1 106.0			
	110							Gray to dark gray LIMESTONE Bedrock @ 108'-109' bgs Apparent void (1')			Natural Collapse (99.5'-135' bgs)
390											
	115										
385											
	120										
380											
	125										
375											
	130										

Report: GEO_CR_WELL; File \\10.73.7.1\SHAREDTVA CCP\GAF\EIP\GAF EIP BORING LOGS.GPJ; 12/28/2016 2:03:35 PM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-441L

Elevation, feet	Depth, feet	SAMPLES: Type / Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
370										
							Gray to dark gray LIMESTONE Bedrock			Natural Collapse (99.5'-135' bgs)
	135						366.1 135.0			
365							End of Boring at 135´ bgs			
	140									
360										
	145									
355										
	150									
350										
	155									
345										
	160									
340										
	165									
335										
	170									
330										
	175									
325										
	180									
320										
	185									
315										
	190									
310										
	195									
305										
	200									

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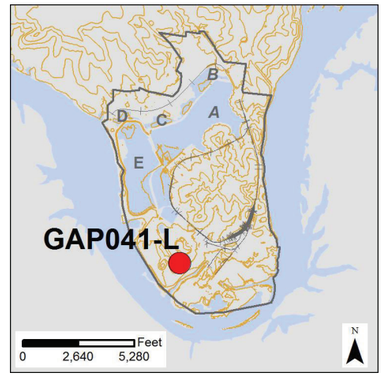
GEOPHYSICAL RECORD OF BOREHOLE: GAP041-L

Ash Pond Complex Groundwater Characterization
Gallatin Fossil Plant
Tennessee Valley Authority

AECOM

Project Number: 60513955

Date: 08/15/2016



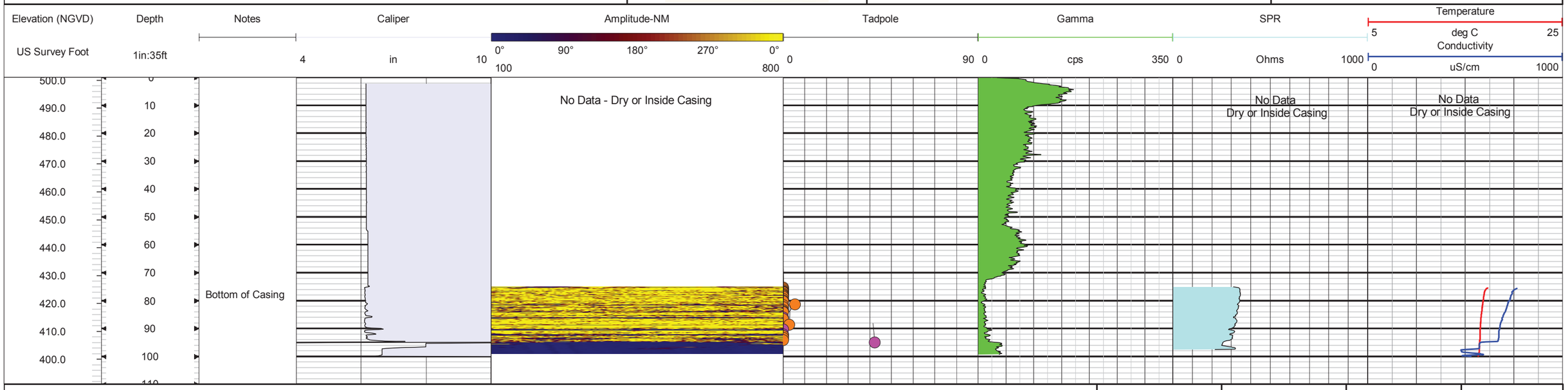
Datum: GAF-Plant Local	Depth Reference Ground Surface	Drill Comp Date: 08/09/2016	
Easting: 1880449.037	Drilling Method Air Hammer	Casing Stick-up: 2.16 ft ags at time of logging	Location: Gallatin, Tn
Northing: 700480.144	Borehole Size: 6 in	Casing Diameter: 6 in at time of logging	Log Date: 08/11/2016
Ground Elev msl: 501.061 ft	Drilled Depth: 135 ft bgs	Casing Depth: 78 ft bgs	Logged By: Jonathan Whitley & Jonathan Moskal

2 - Minor Open Joint / Fracture

3 - Partially Open Joint / Fracture

Notes: Borehole tools could not be advanced any further due to collapse

Water Level Recorded: 30.55 ft bgs prior to logging



GAP041-L Composite plot of all geophysical logs

AECOM	Prepared By JWW	Date 3/30/2017	FIGURE
	Reviewed By	Date	REV 3

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-441U

Sheet 1 of 1

Date(s) Drilled	**9/7/16**	Logged By	**M. Friedman**	Checked By	**C. Scheip**
Drilling Method	**DPT/HSA**	Drill Bit Size/Type	**DPT/HSA**	Total Depth of Borehole	**55.0 feet**
Drill Rig Type	**Geoprobe 8040DT**	Drilling Contractor	**Geologic Exploration**	Surface Elevation	**501.01 ft above msl**
Borehole Backfill	**Monitoring Well**	Sampling Method(s)	**None**	Hammer Data	**1.5" (DPT)/8.25" (HSA)**
Coordinate Location	**N 700,477.6 E 1,880,444.5**	Groundwater Level(s)	**15.5 ft bgs/485.5 msl on 11/4/16**		

Elevation, feet	Depth, feet	SAMPLES: Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											Top of Casing 503.77 msl
500	0							501.0 / 0.0 500.3 / 0.7 Light brown SILT with organics @ 0.5' bgs Gravel present			Portland Grout (0'-34' bgs)
			1		77			Black SAND and GRAVEL, Poorly sorted, Dry @ 1.8'-2' bgs Dark gray very fine SAND, Wet			2" Diameter PVC Riser (0'-40' bgs)
495	5		2		80			@ 6.3'- 6.7' bgs Very fine sand, Saturated			
490	10		3		80			488.3 / 12.7 Mottled gray, orange, and brown CLAY with trace gravel fragements, Moist			
485	15		4		87			@ 13.4' bgs Presence of gray silt increasing @ 15' bgs Mottled red, orange and light gray CLAY with trace gravel sized fragments, High plasticity, Moist			
480	20		5		53						
475	25		6		23			@ 25' bgs Material is moist to wet			
470	30		7		75						
465	35		8		27			@ 35' bgs Light brown CLAY with very fine to fine sand, Soft, Wet			Bentonite Seal (coated pellets) (34'-37' bgs) Sand Pack #2 (37'-50' bgs)
460	40		9		37			461.0 / 40.0 Light brown very fine to fine sandy CLAY, Low plasticity, Wet			
455	45		10		40			455.0 / 46.0 Clayey SAND, Very fine, Wet			0.010 Slot 2" Diameter PVC Screen (40'-50' bgs) Solid PVC End Cap
450	50										Natural Collapse (50'-55' bgs)
445	55							446.0 / 55.0 End of Boring at 55´ bgs			
	60										

Report: GEO_CR_WELL; File \\10.73.7.1\SHARED\TVA CCP\GAF\EIP\GAF EIP BORING LOGS.GPJ; 12/16/2016 9:30:22 AM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-442A

Sheet 1 of 1

Date(s) Drilled	**12/14/16**	Logged By	**J. Hamela**	Checked By	**M. Friedman**
Drilling Method	**HSA**	Drill Bit Size/Type	**6.25" ID HSA**	Total Depth of Borehole	**28.0 feet**
Drill Rig Type	**CME-55**	Drilling Contractor	**Tri-State Drilling, LLC**	Surface Elevation	**507.5 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 12/14/16**	Sampling Method(s)	**2-inch sampler**	Hammer Data	**DTH Hammer**
Coordinate Location	**N 700,164.2 E 1,880,223.5**	Groundwater Level(s)			

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
								507.5 / 0.0			*TOC = 510.42 ft msl*
	0							Log from 0'-26' based on GAP042-D. Brown silty CLAY with limestone fragments, sand, and roots, Dry			**Bentonite Grout (0'-11' bgs)**
505			1		95			505.5 / 2.0 Black coal ASH, Fine to coarse grained, Well graded, Dry			
	5										**2" Diameter PVC Riser (0'-15' bgs)**
500			2		40						
	10							@ 10'-20' bgs Dark brown coal ASH with silty sand and partially weathered rock fragments			**Bentonite Seal (11'-13' bgs)**
495			3		65						**Sand Pack #2 (13'-26' bgs)**
	15										
490			4								
	20										**0.010 Slot 2" Diameter PVC Screen (15'-25' bgs)**
			5					@ 20'-22' bgs Very dark grayish brown coal ASH with silty sand and partially weathered rock fragments			
485			6					@ 22'-24.5' bgs Very dark grayish brown coal ASH with silty sand and partially weathered rock fragments, Damp/Wet			
	25		7					483.0 / 24.5 Strong brown silty CLAY with partially weathered rock, Wet			**Solid PVC End Cap**
			8								**Sand Pack #2 (25'-26' bgs)** **Bentonite Chips (26'-28' bgs)**
480								479.5 / 28.0			
			9		100			End of Boring at 28´ bgs			
	30										
475			10		80						
	35										
470			11		100						
	40										

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AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-442U

Date(s) Drilled	**12/8/16 to 12/19/16**	Logged By	**J. Hamela, E. House**	Checked By	**M. Friedman**
Drilling Method	**DPT/HSA**	Drill Bit Size/Type	**10" ID HSA / 4.25" ID HSA**	Total Depth of Borehole	**69.5 feet**
Drill Rig Type	**Geoprobe DT 7822/ CME-55**	Drilling Contractor	**Tri-State Drilling, LLC**	Surface Elevation	**507.4 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 12/19/16**	Sampling Method(s)	**2-inch sampler**	Hammer Data	**DTH Hammer**
Coordinate Location	**N 700,156.6 E 1,880,217.2**	Groundwater Level(s)			

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											TOC = 510.69 ft msl
	0							504.7 0.0 Log from 0'-26' based on GAP042-D. Brown silty CLAY with limestone fragments, sand, and roots, Dry 502.7 2.0			**Bentonite Grout (0'-55' bgs)**
			1		95			Black coal ASH, Fine to coarse grained, Well graded, Dry			
500	5		2		40						**2" Diameter PVC Riser (0'-59' bgs)**
495	10		3		65			@ 10'-20' bgs Dark brown coal ASH with silty sand and partially weathered rock fragments			
490	15		4								
485	20		5					@ 20'-22' bgs Very dark grayish brown coal ASH with silty sand and partially weathered rock fragments			
			6					@ 22'-24.5' bgs Very dark grayish brown coal ASH with silty sand and partially weathered rock fragments, Damp/Wet			
480	25		7					480.2 24.5 Strong brown silty CLAY with partially weathered rock, Wet			
			8								
			9		100			@ 28' bgs Brownish yellow silty CLAY with partially weathered fragments and fine to coarse sand, Wet			*8-inch PVC casing set @ 28' bgs*
475	30		10		80			@ 32.5' bgs Reddish yellow silty CLAY, hard, with gravel sized nodules			
470	35		11		100						
465	40		1					@ 39'-39.5' bgs Wood fragments			

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/17/2017 3:42:42 PM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-442U

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
	40		2					@ 39.5' bgs Probe refusal; Begin split spoon @ 39.5' bgs Medium brown silty CLAY, Firm, Damp			
			3		60			@ 41.5'-43' bgs With weathered rock			
			4		55						
460	45		5		100			@ 45'-46' bgs Orangish brown silty CLAY @ 46'-48' bgs Medium brown silty CLAY, Soft, Damp			
			6		100			@ 48' bgs Orangish brown silty CLAY, Firm, Dry			
455	50		7		90						
			8		100			@ 51.8' bgs Brownish orange silty CLAY, Firm, Dry			
			9		100						
450	55		10		100						Bentonite Seal (55'-57' bgs)
			11		100						Sand Pack #2 (57'-69.5' bgs)
445	60		12		100			@ 58.5' bgs Rock fragments			Sand Pack #2 (57'-69.5' bgs)
			13		100						
			14		100		441.7	@ 62.8' bgs Trace of sand, Wet @ 63' bgs Orange silty SAND, Dense, Wet	63.0		0.010 Slot 2" Diameter PVC Screen (59'-69' bgs)
440	65		15		100						
			16		80		435.2		69.5		Solid PVC End Cap
435	70							End of Boring at 69.5´ bgs			
430	75										
425	80										
420	85										

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/17/2017 3:42:42 PM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-444U

Sheet 1 of 2

Date(s) Drilled	**12/19/16 to 12/20/16, 1/10/17**	Logged By	**K. Owens**	Checked By	**M. Friedman**
Drilling Method	**DPT/HSA**	Drill Bit Size/Type	**3.25" OD Macrocore / 6.25" ID HSA**	Total Depth of Borehole	**71.5 feet**
Drill Rig Type	**Geoprobe DT 7822/ CME-55**	Drilling Contractor	**Tri-State Drilling, LLC**	Surface Elevation	**483.0 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 1/12/17**	Sampling Method(s)	**2-inch sampler**	Hammer Data	**DTH Hammer**
Coordinate Location	**N 699,619.4 E 1,880,314.1**	Groundwater Level(s)	**35.4 ft bgs on 1/18/17**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
								483.0 / 0.0			*TOC = 486.01 ft msl*
	0							482.3 / 0.8 Top soil to yellowish silty CLAY			
								Brown silty SAND			**Bentonite Grout (0'-46' bgs)**
480			1		67			480.7 / 2.3 Reddish yellow to reddish brown CLAY			
	5										**2" Diameter PVC Riser (0'-50' bgs)**
475			2		75						
	10										
470			3		78			@ 12.3'-12.6' bgs Dark reddish gray silty CLAY			
	15							@ 14.5'-15.5' bgs Silty CLAY			
								@ 15.5'-23' bgs Reddish brown CLAY			
465			4		82						
	20							@ 20'-20.3' bgs Brown CLAY			
460			5		97			@ 23'-24.1' bgs Brown SILT			
	25							@ 24.1' bgs Strong brown CLAY			
								456.8 / 26.3 @ 26.25'-27.5' bgs Brown SILT and CLAY			
455			6		95			455.5 / 27.5 @ 27.5'-30' bgs Brown CLAY with some fine sand			
	30							453.0 / 30.0 Brown SILT			**Bentonite Grout (0'-46' bgs)**
450			7		72			@ 32.1'-32.3' bgs Limestone fragments, Crystalline			
								448.8 / 34.2 Strong brown CLAY			
	35							@ 34.2'-35' bgs Some black mottling ▽			
			8								
445											
	40		1	6 10 10	100			@ 38' bgs Strong brown CLAY with light brown mottles			

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/17/2017 3:42:44 PM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-444U

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
	40			15							2" Diameter PVC Riser (0'-50' bgs)
			2	7 9 12 16	100						
440			3	13 18 17 24	100						
	45		4	6 11 15 17	100			@ 46.5'-47' bgs Angular chert fragments ~1"			Bentonite Seal (46'-48.3' bgs)
435			5	15 17 18 19	100			@ 48.5'-48.7' bgs Angular chert fragments ~1"			Sand Pack #2 (48.3'-61' bgs)
	50		6	6 8 8 10	100			@ 51' bgs Moist @ 52' bgs Black mottles			
430			7	5 6 9 9	100			@ 52.5'-53.5' bgs Strong brown sandy CLAY with chert fragments ~1"			0.010 Slot 2" Diameter PVC Screen (50'-60' bgs)
	55		8	8 10 13 10	75			@ 55' bgs Strong brown CLAY, Wet @ 56' bgs Strong brown sandy CLAY with large chert fragments, Very Wet			
425			9	5 5 5 6	100			@ 58' bgs Strong brown CLAY with few chert fragments ~1/2", Wet			
	60		10	7 8 11 11	85			@ 60' bgs Chert fragments ~1/2"			Solid PVC End Cap
420			11	3 4 6 7	75			@ 64'-66' bgs Strong brown sandy CLAY with chert fragments ~1/2"-1", Wet			
	65		12	4 3 4 4	100			@ 66' bgs Strong brown CLAY, Soft, Wet			
415			13	5 5 7 8	100						Bentonite Backfill (61'-71.5' bgs)
	70		14	0 3 3 3	100			@ 71'-71.5' bgs Angular chert fragments @ 71.5' bgs Split-spoon refusal			
410			15	0 0 3 4				End of Boring at 71.5´ bgs			
	75		16	0 1 1 2							
405			17	1 7 50							
	80										
400											
	85										

411.5 71.5

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/17/2017 3:42:44 PM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-445L

Date(s) Drilled	8/8/16 to 8/9/16	Logged By	N. Shore	Checked By	C. Scheip
Drilling Method	Rotosonic	Drill Bit Size/Type	Rotosonic	Total Depth of Borehole	115.0 feet
Drill Rig Type	Geoprobe 8150 LS	Drilling Contractor	Geologic Exploration	Surface Elevation	469.49 ft above msl
Borehole Backfill	Monitoring Well- Installed 8/30/16 (Formerly GAP045A-L)	Sampling Method(s)	None	Hammer Data	4"/6"
Coordinate Location	N 699,261.8 E 1,880,648.8	Groundwater Level(s)	24.9 ft bgs/444.6 msl on 9/28/16		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
469.5	0.0										Top of Casing 472.30 msl
465	5		1		50			Reddish brown CLAY, Moist			2" Diameter PVC Riser (0'-74' bgs)
460	10							@ 10'-20' bgs Gravel present (1/2" to 1" diameter)			Portland Grout (0'-21' bgs)
455	15		2		60						
450	20							@ 20'-50' bgs Drilling rate increases			
445	25		3		60			▽			
440	30							@ 30'-40' bgs Abundant gravel			
435	35		4		85						
430	40										Bentonite Grout (21'-69' bgs)
425	45		5		85			@ 44' bgs Dark black staining @ 45' bgs Sub-rounded gravel in brown clay matrix			
419.5	50.0							Brownish gray LIMESTONE Bedrock			
415	55		6		60			@ 55' bgs 8-inch Temporary Steel Casing Set			
410	60										

Report: GEO_CR_WELL; File \\10.73.7.1\SHAREDTVA CCP\GAF\EIP\GAF EIP BORING LOGS.GPJ; 12/28/2016 12:43:29 PM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-445L

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
405	60							Brownish gray LIMESTONE Bedrock			2" Diameter PVC Riser (0'-74' bgs)
	65		7		60						Bentonite Grout (21'-69' bgs)
400	70										Bentonite Seal (69'-72' bgs)
											Sand Pack #2 (72'-99' bgs)
395	75		8		20			@ 77' bgs Decrease in water returning to surface			
390	80							@ 80'-90' bgs Alternating zones of increasing and decreasing drilling rate, Some fossil shells and chert nodules present			0.010 Slot 2" Diameter PVC Screen (74'-94' bgs)
385	85		9		20						
380	90							@ 90'-100' bgs Some chert nodules, Very little water returning to surface			
375	95		10		50						Solid PVC End Cap
370	100										
365	105		11		35						Bentonite Backfill (99'-110' bgs)
360	110										Natural Collapse (110'-115' bgs)
355	115						354.5	End of Boring at 115´ bgs	115.0		
350	120										
345	125										
340	130										

Report: GEO_CR_WELL; File \\10.73.7.1\SHAREDTVA CCP\GAF\EIP\GAF EIP BORING LOGS.GPJ; 12/28/2016 12:43:29 PM

AECOM

GEOPHYSICAL RECORD OF BOREHOLE: GAP045A-L

Ash Pond Complex Groundwater Characterization
Gallatin Fossil Plant
Tennessee Valley Authority

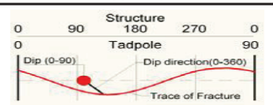
AECOM

Project Number: 60513955

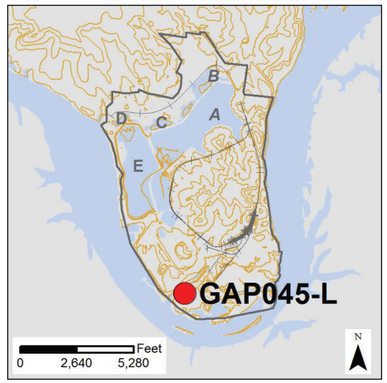
Date: 08/11/2016

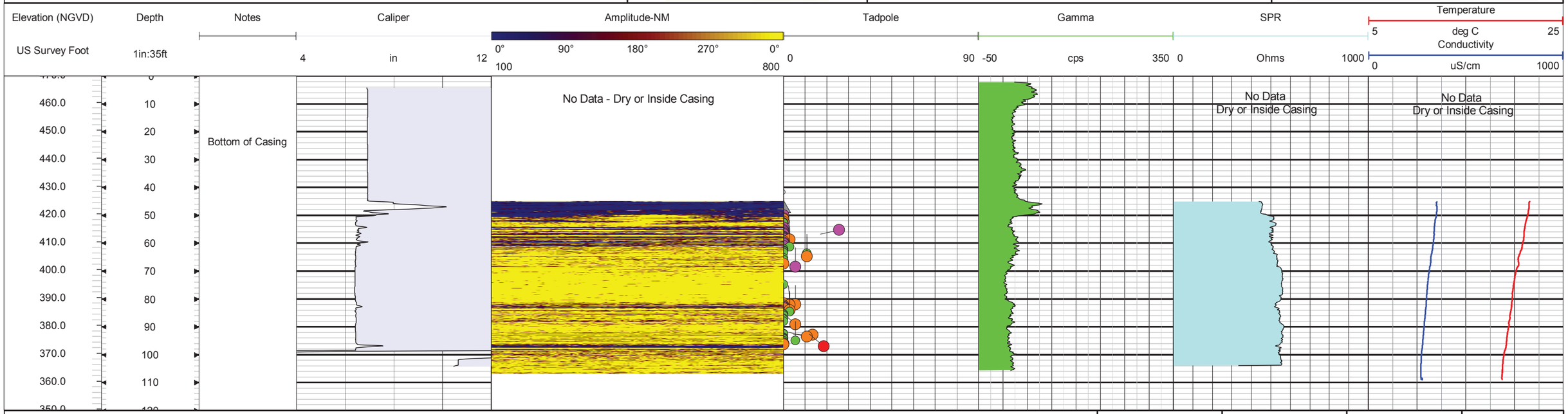
Datum: GAF-Plant Local	Depth Reference Ground Surface	Drill Comp Date: 08/09/2016	
Easting: 1880648.757	Drilling Method Rotosonic	Casing Stick-up: 0.16 ft ags at time of logging	Location: Gallatin, Tn
Northing: 699261.826	Borehole Size: 6 in	Casing Diameter: 8 in at time of logging	Log Date: 08/09/2016
Ground Elev msl: 469.49 ft	Drilled Depth: 115 ft bgs	Casing Depth: 45 ft bgs	Logged By: Jonathan Whitley

0 - Broken Zone / Undifferentiated
1 - Major Open Joint / Fracture
2 - Minor Open Joint / Fracture
3 - Partially Open Joint / Fracture
5 - Bedding / Banding / Foliation



Notes:
Water Level Recorded: 24.55 ft bgs prior to logging





GAP045A-L Composite plot of all geophysical logs

AECOM	Prepared By JWW	Date 3/30/2017	FIGURE
	Reviewed By	Date	REV 2

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-447U

Sheet 1 of 1

Date(s) Drilled	**12/21/16**	Logged By	**K. Owens**	Checked By	**M. Friedman**
Drilling Method	**DPT**	Drill Bit Size/Type	**6.25" ID HSA**	Total Depth of Borehole	**14.2 feet**
Drill Rig Type	**Geoprobe DT7822/ CME-22**	Drilling Contractor	**Tri-State Drilling, LLC**	Surface Elevation	**452.4 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 1/13/17**	Sampling Method(s)	**2-inch sampler**	Hammer Data	**DTH Hammer**
Coordinate Location	**N 701,986.2 E 1,878,620.7**	Groundwater Level(s)	**6.8 ft bgs on 1/18/17**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											TOC = 455.78 ft msl
452.4	0.0										
451.9	0.5							Dark brown silty CLAY			
450	0							Strong brown CLAY with black nodules and chert fragments, Wet			**Bentonite Seal (0'-6.1' bgs)**
			1		63						**2" Diameter PVC Riser (0'-8.6' bgs)**
445	5							@ 5'-10' bgs Angular chert fragments ~1", Damp			**Sand Pack #2 (6.1'-14.2' bgs)**
			2		100						
440	10							@ 10' bgs Brown CLAY with black nodules and limestone fragments ~1"-2" at bottom of rod, Very Stiff			**0.010 Slot 2" Diameter PVC Screen (8.6'-13.6' bgs)**
			3		67						
								No recovery from 13.1'-14.2' bgs			**Solid PVC End Cap**
438.2	14.2							Auger refusal @ 14.2' bgs			
435	15							End of Boring at 14.2´ bgs			
430	20										
425	25										
420	30										
415	35										
	40										

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/17/2017 3:42:45 PM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-448L

Sheet 1 of 3

Date(s) Drilled	8/27/16 to 9/1/16	Logged By	N. Shore	Checked By	C. Scheip
Drilling Method	Rotosonic	Drill Bit Size/Type	Rotosonic	Total Depth of Borehole	160.0 feet
Drill Rig Type	Geoprobe 8150 LS	Drilling Contractor	Geologic Exploration	Surface Elevation	473.32 ft above msl
Borehole Backfill	Monitoring Well-Installed 9/14/16 (Formerly GAP048A-L)	Sampling Method(s)	None	Hammer Data	4"/6"
Coordinate Location	N 700,674.6 E 1,878,836.5	Groundwater Level(s)	17.5 ft bgs/455.8 msl on 11/4/16		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											Top of Casing 476.13 msl
473.3	0							Clayey SAND, Coarse, Dry to moist			2" Diameter PVC Riser (0'-86' bgs)
470	5		1		40						
465	10										Bentonite Grout (0'-80' bgs)
461.3	12.0							@ 11.5'-12' bgs Dark stained material present			
460	15		2		100			Reddish brown CLAY with coarse gravel, Moist			
455	20		3		100						
450	25										
445	30							@ 30' bgs Presence of coarse gravel dissipating			
440	35		4		100						
435	40							@ 41'- 42' bgs Hard, Fibrous and woody material present			
430	45		5		45			@ 42'-50' bgs Grayish brown CLAY, Hard, Moist			
425	50										
420	55		6		75						
414.3	59.0							Gray LIMESTONE Bedrock, Hard			
415	60										

Report: GEO_CR_WELL; File \\10.73.7.1\SHAREDTVA CCP\GAF\EIP\GAF EIP BORING LOGS.GPJ; 12/28/2016 12:43:30 PM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-448L

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
410	60							Gray LIMESTONE Bedrock, Hard			2" Diameter PVC Riser (0'-86' bgs)
405	65		7		100			@ 65' bgs 8-inch Temporary Steel Casing Set			
400	70		8		100						Bentonite Grout (0'-80' bgs)
395	75										
390	80		9		100						Bentonite Seal (80'-83' bgs)
385	85										Sand Pack #2 (83'-96.5' bgs)
380	90		10		80			@ 92' bgs Apparent void, Loss water returning to surface			0.010 Slot 2" Diameter PVC Screen (86'-96' bgs)
375	95										Solid PVC End Cap
370	100		11		80						Bentonite Backfill (96.5'-160' bgs)
365	105										
360	110		12		0			@ 110' bgs No recovery, Coarse sandy clay coating outside of sampler, Assumed lithology			
355	115										
350	120		13		10			@ 120' bgs Poor recovery, Drilling rate decreases			
345	125										
	130										

Report: GEO_CR_WELL; File \\10.73.7.1\SHAREDTVA CCP\GAF\EIP\GAF EIP BORING LOGS.GPJ; 12/28/2016 12:43:30 PM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-448L

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
340	135		14		0			Gray LIMESTONE Bedrock, Hard @ 130' bgs No recovery, Assumed lithology, Drilling rate increases			**Bentonite Backfill (96.5'-160' bgs)**
335	140										
330	145		15		20						
325	150							@ 150' bgs Brownish gray LIMESTONE Bedrock			
320	155		16		77						
315	160							313.3 160.0 End of Boring at 160´ bgs			
310	165										
305	170										
300	175										
295	180										
290	185										
285	190										
280	195										
275	200										

Report: GEO_CR_WELL; File \\10.73.7.1\SHAREDTVA CCP\GAF\EIP\GAF EIP BORING LOGS.GPJ; 12/28/2016 12:43:30 PM

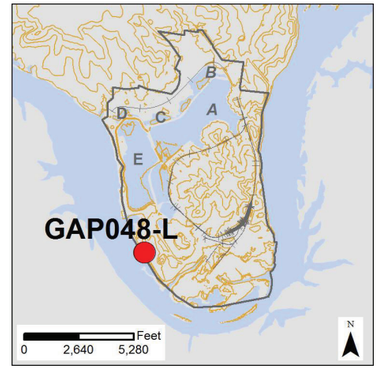
GEOPHYSICAL RECORD OF BOREHOLE: GAP048A-L

Ash Pond Complex Groundwater Characterization
Gallatin Fossil Plant
Tennessee Valley Authority

AECOM

Project Number: 60513955

Date: 09/07/2016



Datum: GAF-Plant Local	Depth Reference Ground Surface	Drill Comp Date: 09/01/2016	
Easting: 1878836.512	Drilling Method Rotosonic	Casing Stick-up: 1.16 ft ags at time of logging	Location: Gallatin, Tn
Northing: 700674.566	Borehole Size: 6 in	Casing Diameter: 8 in at time of logging	Log Date: 09/06/2016
Ground Elev msl: 473.321 ft	Drilled Depth: 160 ft bgs	Casing Depth: 65 ft bgs	Logged By: Jonathan Moskal

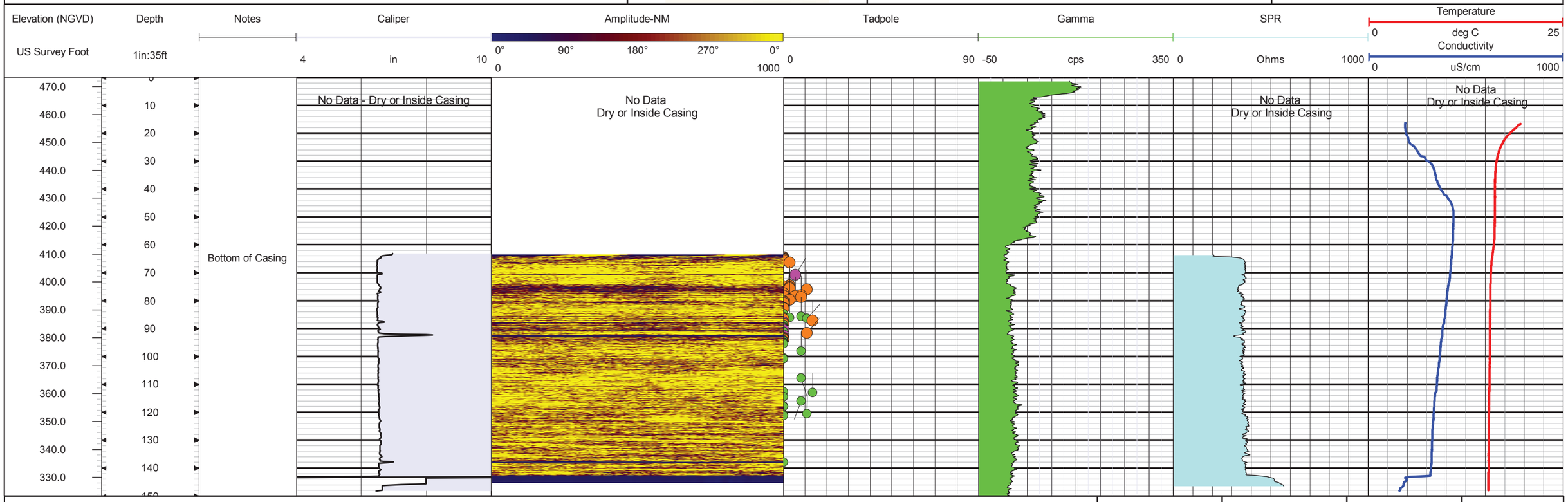
2 - Minor Open Joint / Fracture

3 - Partially Open Joint / Fracture

5 - Bedding / Banding / Foliation

Notes:

Water Level Recorded: 15.25 ft bgs prior to logging



GAP048A-L Composite plot of all geophysical logs

AECOM	Prepared By JWW	Date 3/30/2017	FIGURE
	Reviewed By	Date	REV 2

Project: GAF EIP Project Location: Gallatin, TN Project Number: 60513955	**Log of Monitoring Well GAF-448U** Sheet 1 of 1

Date(s) Drilled	9/20/16	Logged By	N. Shore	Checked By	C. Scheip
Drilling Method	Rotosonic	Drill Bit Size/Type	Rotosonic	Total Depth of Borehole	50.0 feet
Drill Rig Type	Geoprobe 8150 LS	Drilling Contractor	Geologic Exploration	Surface Elevation	473.18 ft above msl
Borehole Backfill	Monitoring Well	Sampling Method(s)	None	Hammer Data	4"/6"
Coordinate Location	N 700,678.9 E 1,878,834.8	Groundwater Level(s)	16.5 ft bgs/456.7 msl on 10/12/16		

Elevation, feet	Depth, feet	SAMPLES: Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
473.2	0.0							Brown sandy SILT with organics, Moist			Top of Casing 475.97 msl
470	5		1		30						Portland Grout (0'-15' bgs)
											2" Diameter PVC Riser (0'-35' bgs)
465	10							@ 8' bgs Black coarse SAND			
463.2	10.0							Reddish brown CLAY with gravel, Moist			
460	15		2		60						
455	20		3		75						Bentonite Seal (15'-33' bgs)
450	25										
445	30		4		60			@ 35' bgs Dark brown CLAY with organics and small gravel, Moist to wet			Sand Pack #2 (33'-50' bgs)
440	35										
435	40										
433.2	40.0							Undetermined, no recovery			0.010 Slot 2" Diameter PVC Screen (35'-50' bgs)
430	45		5		0						
425	50										Solid PVC End Cap
423.2	50.0							End of Boring at 50´ bgs			
420	55										
415	60										

Report: GEO_CR_WELL; File \\10.73.7.1\SHAREDTVA CCP\GAF\EIP\GAF EIP BORING LOGS.GPJ; 12/28/2016 12:43:56 PM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-489A

Sheet 1 of 1

Date(s) Drilled	**12/13/16**	Logged By	**J. Hamela**	Checked By	**M. Friedman**
Drilling Method	**HSA**	Drill Bit Size/Type	**6.25" ID HSA**	Total Depth of Borehole	**15.5 feet**
Drill Rig Type	**CME-22**	Drilling Contractor	**Tri-State Drilling, LLC**	Surface Elevation	**472.4 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 12/13/16**	Sampling Method(s)	**No samples collected**	Hammer Data	**DTH Hammer**
Coordinate Location	**N 699,759.5 E 1,879,558.9**	Groundwater Level(s)	**2.5 ft bgs on 12/12/16**		

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											TOC = 475.45 ft msl
472.4	0.0										
471.9	0.5							Log from 0'-15.5' based on GAP089-D. Very dark brown silty fine to medium SAND with organic matter (roots), Dry			
470			1					Very dark gray fine to coarse sand (ASH), Well graded, Dry @ 2.5'-13' bgs Wet			**Bentonite Grout (0'-1' bgs)**
											Bentonite Seal (1'-3' bgs)
	5										**2" Diameter PVC Riser (0'-5' bgs)**
465			2								**Sand Pack #2 (3'-15' bgs)**
	10										**0.010 Slot 2" Diameter PVC Screen (5'-15' bgs)**
460			3								
459.4	13.0							Reddish yellow silty CLAY with fine to medium sand, Wet			
456.9	15.5										**Solid PVC End Cap**
	15							End of Boring at 15.5´ bgs			
455											
	20										
450											
	25										
445											
	30										
440											
	35										
435											
	40										

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/17/2017 3:42:55 PM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-489U

Sheet 1 of 2

Date(s) Drilled	**12/12/16 to 1/4/17**	Logged By	**J. Hamela**	Checked By	**M. Friedman**
Drilling Method	**HSA**	Drill Bit Size/Type	**10.0" ID HSA / 4.25" ID HSA**	Total Depth of Borehole	**54.5 feet**
Drill Rig Type	**Geoprobe DT7822**	Drilling Contractor	**Tri-State Drilling, LLC**	Surface Elevation	**472.9 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 1/4/17**	Sampling Method(s)	**2-inch sampler**	Hammer Data	**DTH Hammer**
Coordinate Location	**N 699,746.8 E 1,879,566.5**	Groundwater Level(s)			

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Pene-trometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											TOC = 475.26 ft msl
	0							472.9 / 0.0 472.4 / 0.5 Log from 0'-15.5' based on GAP089-D. Very dark brown silty fine to medium SAND with organic matter (roots), Dry			
470			1					Very dark gray fine to coarse sand (ASH), Well graded, Dry @ 2.5'-13' bgs Wet			**Bentonite Grout (0'-40' bgs)**
	5										**2" Diameter PVC Riser (0'-44' bgs)**
465			2								
	10										
460			3					459.9 / 13.0 Reddish yellow silty CLAY with fine to medium sand, Wet			
	15							@ 15'-20' bgs Yellowish red silty CLAY, Highly plastic, Wet			*8-inch PVC casing set @ 15' bgs*
455			4		80						
	20							@ 20'-25' bgs Strong brown silty CLAY with sand, Plastic, Wet			
450			5		100						
	25							@ 25'-30' bgs Yellowish brown silty CLAY with sand, Plastic, Wet			
445			6		100						
	30							@ 30'-54.5' bgs Reddish yellow silty CLAY with sand, Plastic, Wet			
440			7		100						
	35										
435			8		100						
	40										

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/17/2017 3:42:56 PM

AECOM

Project: GAF EIP
Project Location: Gallatin, TN
Project Number: 60513955

Log of Monitoring Well GAF-489U

Sheet 2 of 2

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
	40							@ 40'-54.5' bgs Contains nodules			Bentonite Seal (40'-42' bgs)
430			9		100						Sand Pack #2 (42'-54.2' bgs)
	45										
425			10		100						0.010 Slot 2" Diameter PVC Screen (44'-54' bgs)
	50										
420			11		100			@ 54.2' Auger refusal @ 54.5' bgs Probe refusal			
								418.4 54.5			Solid PVC End Cap Natural Collapse (54.2'-54.5' bgs)
	55							End of Boring at 54.5´ bgs			
415											
	60										
410											
	65										
405											
	70										
400											
	75										
395											
	80										
390											
	85										

Report: GEO_CR_WELL; File S:\TVA CCP\GAF\EIP\GAF EIP TASK 7 CCR QUANTITY.GPJ; 8/17/2017 3:42:56 PM

AECOM

Project: GAF VEI
Project Location: Gallatin, TN
Project Number: 60581591

Log of Monitoring Well GAF-526L

Date(s) Drilled	**8/13/18 to 8/14/18**	Logged By	**M. Edmunds**	Checked By	**C. Scheip**
Drilling Method	**Rotosonic**	Drill Bit Size/Type	**Nominal 4", 6", 7", 8" (Sonic)**	Total Depth of Borehole	**210.0 feet**
Drill Rig Type	**TSi 150CC SONIC Rig (Compact Crawler)**	Drilling Contractor	**Cascade**	Surface Elevation	**476.38 ft above msl**
Borehole Backfill	**Monitoring Well- Installed 8/16/18 (Formerly GAP126-Y)**	Sampling Method(s)	**6-inch sonic**	Hammer Data	**N/A**
Coordinate Location	**N 699,740.4 E 1,879,370.3**	Groundwater Level(s)	**35.17 ft bgs**		

Elevation, feet	Depth, feet	SAMPLES Type	Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
											Top of Casing 479.34 msl
475	0	SONIC	1		100			476.4 0.0 Red/orange, brown, trace gray silty lean CLAY, Trace sand/gravel, Stiff to firm, Moist			2" Diameter PVC Riser (0'-152' bgs)
470	5										
465	10	SONIC	2		100			@ 10'-20' bgs Becomes lean to slightly fat with increased moisture content with depth			Bentonite Seal (0'-150' bgs)
460	15										
455	20	SONIC	3		100			456.4 20.0 Red/brown, trace gray silty fat CLAY, Trace sand, Firm, Moist to Gray/brown silty fat CLAY, Stiff, Moist			
450	25										
445	30	SONIC	4		100			446.4 30.0 Orange, red clayey SAND with gravel, Moderately well to well sorted, Subround to trace subangular, Loose, Very moist	▽		
440	35										
435	40	SONIC	5		100			436.4 40.0 Orange/red/trace gray very silty fat CLAY with some sand and gravel, Firm, Moist			
430	45							@ 45'-50' bgs Increase in silt and decrease in gravel/sand with depth			
425	50							Red/brown sandy, silty fat CLAY with gravel, Soft, Very Moist			
420	55	SONIC	6		100			@ 58'-60' bgs Becomes very gravelly weathered limestone			
	60										

Report: GEO_CR_WELL; File \\10.73.7.1\SHARED\TVA CCP\GAF\EIP\60581591 VEI\GAF VEI.GPJ; 3/7/2019 10:56:37 AM

Project: GAF VEI
Project Location: Gallatin, TN
Project Number: 60581591

Log of Monitoring Well GAF-526L

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
415	60							Orange/red/brown/trace gray, silty, gravelly fat CLAY with some sand, Firm, Moist to very moist			**2" Diameter PVC Riser (0'-152' bgs)**
410	65	SONIC	7		100						**Bentonite Seal (0'-150' bgs)**
405	70										
400	75	SONIC	8		80			400.4 / 76.0			
395	80							Gray/dark gray/brown highly weathered LIMESTONE bedrock with some intermittent clay, Soft to Gray/dark gray/brown micritic LIMESTONE bedrock, Laminar to very thinly bedded, Moderate to slight weathering, Not competent (Some visible possible flow pathways/weathered fracture surfaces) 396.4 / 80.0			
390	85	SONIC	9		100			@ 79.5'-80' bgs Zone of clay and gravel Gray/dark gray biomicritic, fossiliferous LIMESTONE bedrock, Some brown surfaces, Laminar to thinly bedded, Moderately hard, Competent @ 82.5'-82.8' bgs Slightly weathered with trace clay, Less competent @ 86'-87' bgs Slightly weathered with trace clay, Less competent			
385	90							Dark gray to medium/light gray biomicritic, fossiliferous LIMESTONE bedrock, Thinly bedded with laminar shale interbeds, Trace weathering, Moderately hard, Competent			
380	95	SONIC	10		100			@ 93.4'-94.2' bgs Light to moderate weathering, Small fragments and evidence of remineralization, Less competent			
375	100							@ 98'-99' bgs Light to moderate weathering, Small fragments and evidence of remineralization, Less competent @ 100' bgs Becomes fresh, Competent, Abundant laminar shale interbeds			
370	105	SONIC	11		100			@ 103.6'-105.5' bgs Less competent			
365	110							@ 108'-109' bgs Abundant clay infill @ 109'-110' bgs Abundant smaller fragments with evidence of light to moderate weathering, Abundant clay infill, Less competent Medium to dark gray micritic LIMESTONE bedrock, Thinly bedded with laminar shale interbeds, Fresh, Moderately hard to hard, Competent			
360	115	SONIC	12		100			@ 111.8'-112.2' bgs Slightly less competent @ 116'-116.3' bgs Slightly less competent			
355	120							Medium to dark gray micritic LIMESTONE bedrock, Thinly bedded with trace laminar shale interbeds, Fresh, Moderately hard, Competent			*@ 120' bgs 7" outer casing set*
350	125	SONIC	13		100			@ 123.4'-123.7' bgs Slightly less competent			
	130										

Report: GEO_CR_WELL; File \\10.73.7.1\SHARED\TVA CCP\GAF\EIP\60581591 VEI\GAF VEI.GPJ; 3/7/2019 10:56:37 AM

Project: GAF VEI
Project Location: Gallatin, TN
Project Number: 60581591

Log of Monitoring Well GAF-526L

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resist. Blows/6" OR CORE% RQD	Recovery, %	Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
345								Medium to dark gray micritic LIMESTONE bedrock, Thinly bedded with trace laminar shale interbeds, Fresh, Moderately hard, Competent			2" Diameter PVC Riser (0'-152' bgs)
	135	SONIC	14		100						
340											
	140							Dark to medium gray micritic, crystalline LIMESTONE bedrock, Laminar to thinly bedded, Fresh, Moderately hard to hard, Competent			Bentonite Seal (0'-150' bgs)
335											
	145	SONIC	15		100						
330								@ 147'-148.1' bgs Less competent			
	150							@ 149.4'-150' bgs Less competent, Trace weathering			Sand Pack #2 (150'-164' bgs)
325								Dark to medium gray micritic LIMESTONE bedrock with larger crystalline matrix, Thinly bedded to laminar, Evidence of remineralized calcite, Trace fossil, Fresh, Moderately hard to hard, Competent			
	155	SONIC	16		100			@ 150.8'-151.2' bgs Less competent, Trace weathering @ 152.5'-154.9' bgs Less competent, Trace weathering			0.010 Slot 2" Diameter PVC Screen (152'-162' bgs)
320											
	160							@ 159.1'-160' bgs Less competent, Trace weathering @ 160' bgs Increase in amount of crystallization/sparry matrix and increase in laminar shale interbedding with depth, Trace weathering			Solid PVC End Cap
315											
	165	SONIC	17		70			@ 160.3'-160.7' bgs Less competent			
310											
	170							@ 169.2'-169.8' bgs Less competent			Bentonite Backfill (164'-210' bgs)
305								Dark to medium gray LIMESTONE bedrock, Micritic to finely crystalline matrix, Thinly bedded with abundant laminar shale interbedding, Trace fossils, Lightly weathered, Moderately hard, Competent			
	175	SONIC	18								
300											
	180							@ 180' bgs Becomes less competent			
295											
	185	SONIC	19		80						
290											
	190							Medium to light gray, some dark finely crystalline LIMESTONE bedrock, Thinly to laminar bedding with shale interbeds, Moderately hard to hard, Competent			
285											
	195	SONIC	20		100			@ 193.3'-193.9' bgs Less competent, Slightly weathered			
280											
	200							@ 198.4'-199.2' bgs Less competent, Slightly weathered			

Report: GEO_CR_WELL; File \\10.73.7.1\SHARED\TVA CCP\GAF\EIP\60581591 VEI\GAF VEI.GPJ; 3/7/2019 10:56:37 AM

Project: GAF VEI
Project Location: Gallatin, TN
Project Number: 60581591

Log of Monitoring Well GAF-526L

Sheet 4 of 4

Elevation, feet	Depth, feet	SAMPLES: Type / Number	SAMPLES: Sampling Resist. Blows/6" OR CORE% RQD	SAMPLES: Recovery, %	SAMPLES: Pocket Penetrometer (tsf)	Graphic Log	MATERIAL DESCRIPTION	Water Content %	Well Details	REMARKS AND OTHER DETAILS
275										
	205	SONIC 21		100			Dark gray finely crystalline, micritic LIMESTONE bedrock, Thin laminar bedding with increase in shale interbeds, Moderately hard, Competent @ 206.2' bgs Evidence of calcite recrystallization fractures/bedding plane surfaces			**Bentonite Backfill (164'-210' bgs)**
270										
	210						266.4 210.0 End of Boring at 210´ bgs			
265										
	215									
260										
	220									
255										
	225									
250										
	230									
245										
	235									
240										
	240									
235										
	245									
230										
	250									
225										
	255									
220										
	260									
215										
	265									
210										
	270									

Report: GEO_CR_WELL; File \\10.73.7.1\SHARED\TVA CCP\GAF\EIP\60581591 VEI\GAF VEI.GPJ; 3/7/2019 10:56:37 AM

AECOM

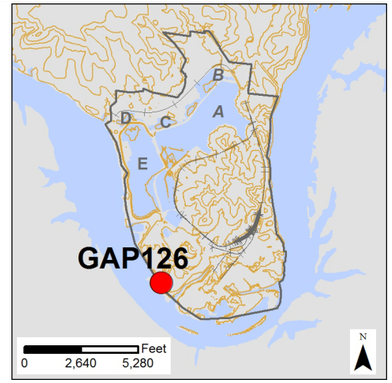
GEOPHYSICAL RECORD OF BOREHOLE: GAP126-Y TD=210

EIP Vertical Extent Investigation
Gallatin Fossil Plant
Tennessee Valley Authority

AECOM

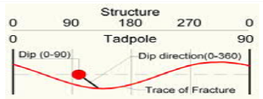
Project Number: 60581591

Date: 4/22/2020



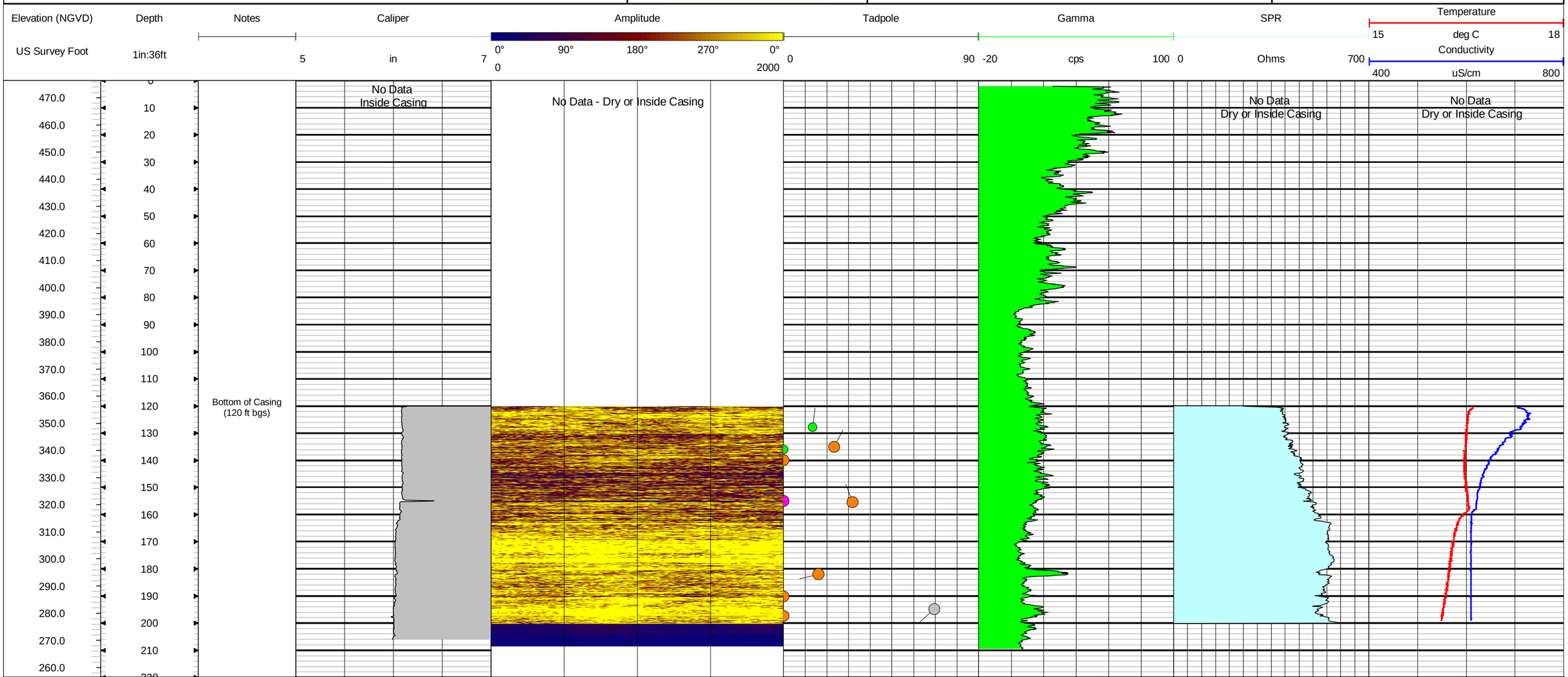
Datum: GAF-Plant Local	Depth Reference Ground Surface	Drill Comp Date: 8/14/2018	
Easting: 1879370.324	Drilling Method Rotosonic	Casing Stick-up: 0.2 ft ags	Location: Gallatin, TN
Northing: 699740.414	Borehole Size: 6 in	Casing Diameter: 7 in	Log Date: 8/15/2018
Ground Elev msl: 476.38	Drilled Depth: 210 ft bgs	Casing Depth: 120 ft bgs	Logged By: Sean Buchanan

2 - Minor Open Joint / Fracture
3 - Partially Open Joint / Fracture
4 - Filled Fracture / Joint
5 - Bedding / Banding / Foliation



Notes: GAF-526L installed. Well Screen 152-162 ft bgs

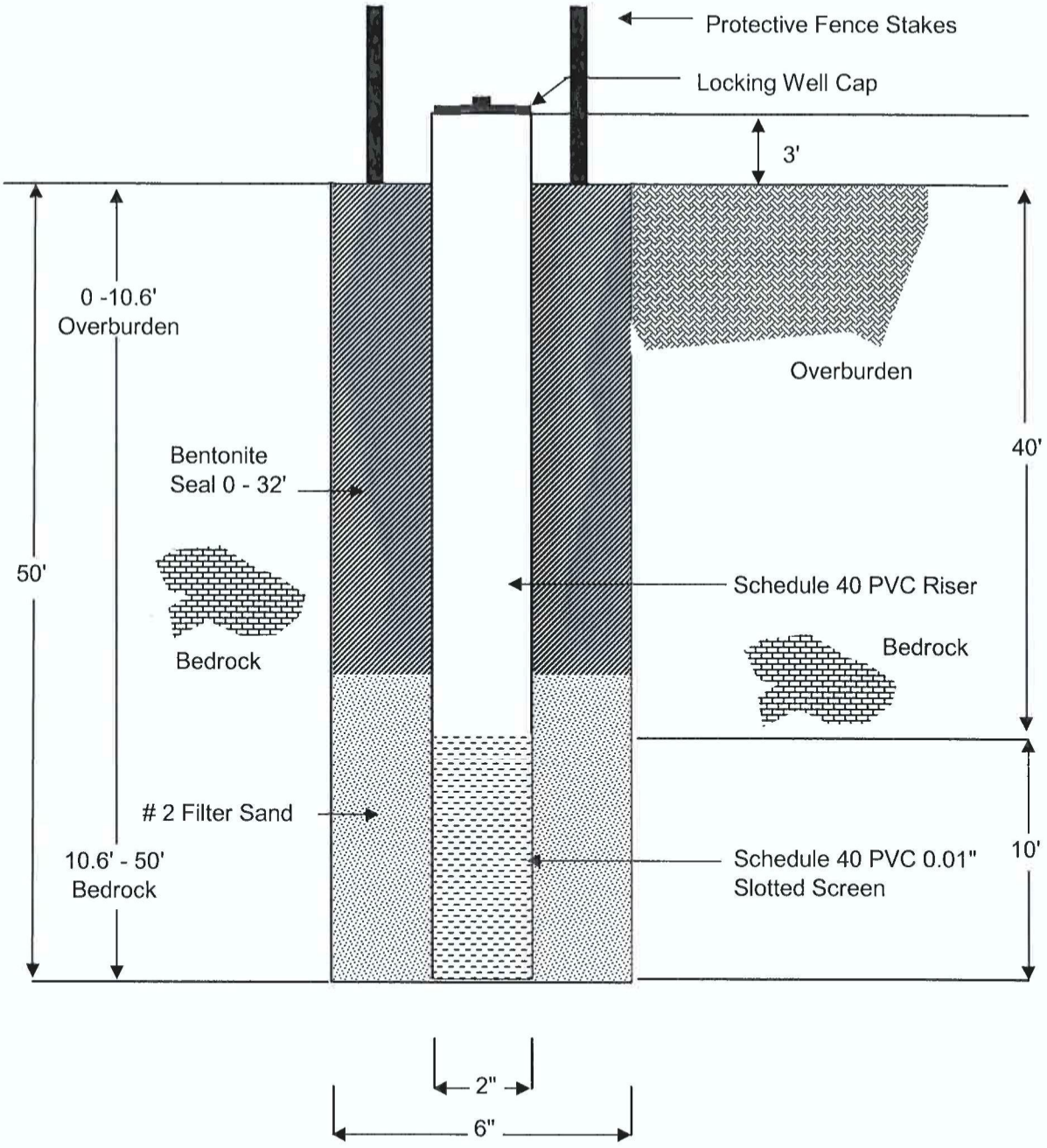
Water Level Recorded: 26.23 ft bgs prior to logging 8/15/2018



GAP126-Y Composite plot of all geophysical logs

AECOM

Prepared By SDB	Date 01/02/2019	FIGURE	
Reviewed By JWW	Date 2/1/2020	REV 2	



Date Constructed	9/22/2011	Ground Surface Elev.	Not provided
Boring Depth	50'	Boring Termination Elev.	N/A
Bottom of Well	50'	Total Well Depth	50'
Length of Screen	10'	Length of Riser	43'
Top of Sand	32'	Vol./Wt. of Sand	N/A
Top of Bentonite	ground surface	Vol./Wt. of Bentonite	N/A
Top of Grout	N/A	Vol./Wt. of Grout	N/A

S&ME

Well Construction Figure

Monitoring Well I.D.: R-4

Project Name: TVA Gallatin Inactive Ash Pond | Project Number: 1431-1-240

Scale : NTS | Drawn By: TMD | Checked By: CTJ | Date: 10-6-11

PROJECT:	BORING LOG:
TVA Gallatin **Gallatin, Tennessee** **S&ME Project No. 1431-11-240**	**R-4**

DATE DRILLED: **9/15/11**	ELEVATION: FEET	NOTES: **Soil descriptions based on visual observation of obtained samples.**
DRILLING METHOD: **CME 55, 3¼" H.S.A.**	BORING DEPTH: **10.6** FEET	
LOGGED BY: **TMD**	WATER LEVEL @ TOB: **Not Encountered**	
DRILLER: **D. Lowe**	WATER LEVEL @ 24 hrs: **Not Recorded**	

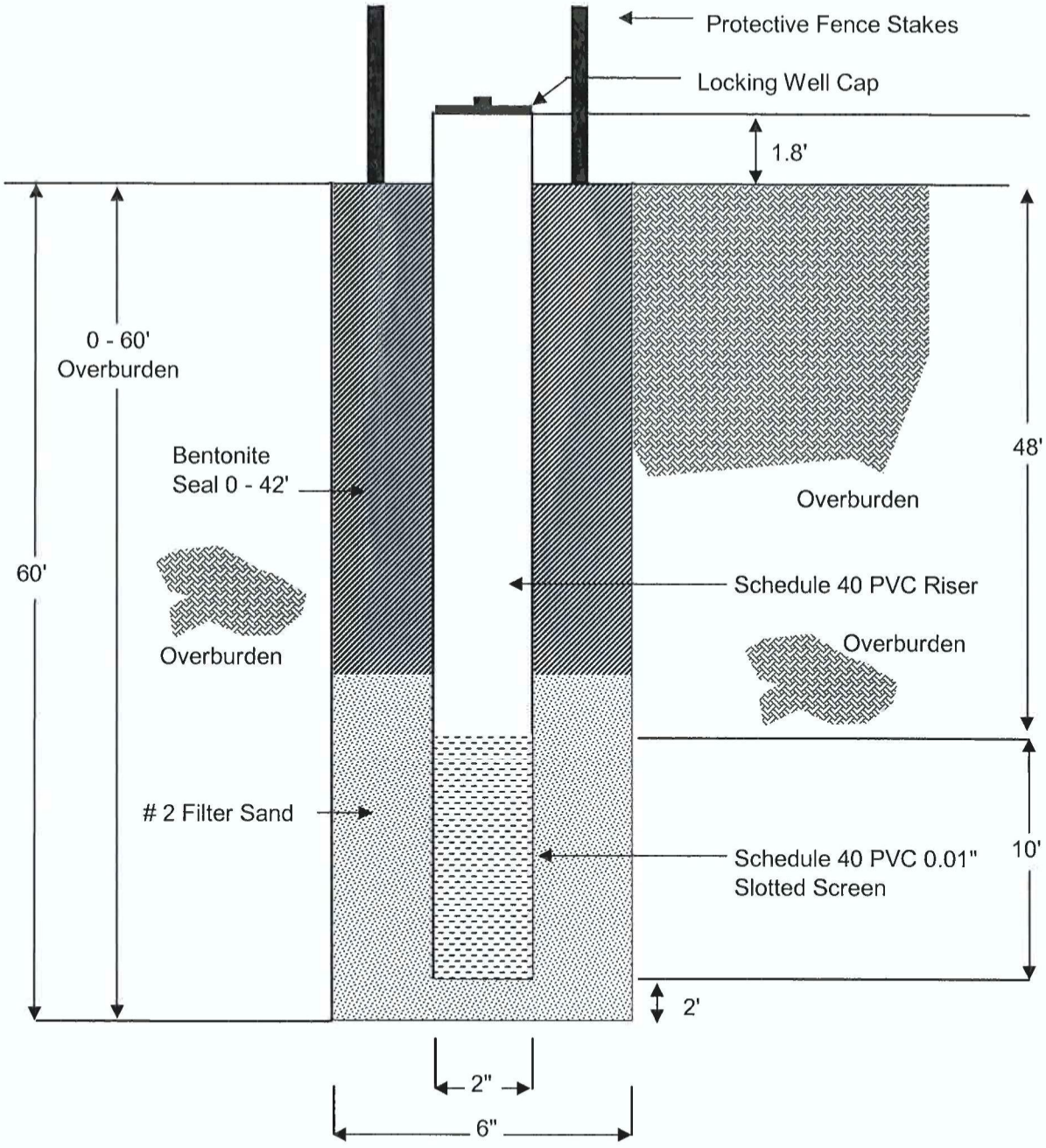
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
		ASH										
5		**FAT CLAY (CH)**- with manganese nodules; brown, gray, and yellow brown; slightly moist to moist; stiff - ALLUVIUM			1			3	5	8		13
10		**FAT CLAY (CH)** - brown and yellow brown; slightly moist; stiff - RESIDUUM **WEATHERED LIMESTONE** - brownish-gray; hard Auger Refusal Encountered at 10.6 Feet			2			5	11	22		33

BORING LOG - TVA 11-240R.GPJ 11/10/11

NOTES:

1. *BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.*
2. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
3. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

S&ME



Date Constructed	9/15/2011	Ground Surface Elev.	Not Provided
Boring Depth	60'	Boring Termination Elev.	N/A
Bottom of Well	58'	Total Well Depth	58'
Length of Screen	10'	Length of Riser	49.8'
Top of Sand	42'	Vol./Wt. of Sand	N/A
Top of Bentonite	ground surface	Vol./Wt. of Bentonite	N/A
Top of Grout	N/A	Vol./Wt. of Grout	N/A

S&ME

Well Construction Figure

Monitoring Well I.D.: S-3

Project Name: TVA Gallatin Inactive Ash Pond | Project Number: 1431-11-240

Scale : NTS | Drawn By: TMD | Checked By: CTJ | Date: 10-6-11

PROJECT:	BORING LOG:
TVA Gallatin **Gallatin, Tennessee** **S&ME Project No. 1431-11-240**	**S-3**

DATE DRILLED: **9/15/11**	ELEVATION: FEET	NOTES: **Soil descriptions based on visual observation of obtained samples. Environmental samples collected from 36 to 38 ft and 58 to 60 ft.**
DRILLING METHOD: **CME 55, 3¼" H.S.A.**	BORING DEPTH: **60.0** FEET	
LOGGED BY: **TMD**	WATER LEVEL @ TOB: **50 feet**	
DRILLER: **D. Lowe**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
5		Note - TVA decided to collect additional samples near location R-3 and construct an overburden monitoring well designated as S-3. Began sampling at 33.5 feet.									
10											
15											
20											
25											
30											

BORING LOG - TVA 11-240S.GPJ 11/10/11

NOTES:

1. *BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.*
2. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
3. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

S&ME

PROJECT:	BORING LOG:
TVA Gallatin **Gallatin, Tennessee** **S&ME Project No. 1431-11-240**	**S-3**

DATE DRILLED: **9/15/11**	ELEVATION: FEET	NOTES: **Soil descriptions based on visual observation of obtained samples. Environmental samples collected from 36 to 38 ft and 58 to 60 ft.**
DRILLING METHOD: **CME 55, 3¼" H.S.A.**	BORING DEPTH: **60.0** FEET	
LOGGED BY: **TMD**	WATER LEVEL @ TOB: **50 feet**	
DRILLER: **D. Lowe**	WATER LEVEL @ 24 hrs: **Not Recorded**	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft) 5 15 30	SPT INTERVALS (blows/6 inches) 1st	2nd	3rd	4th	N VALUE
35					1			3	6	6		12
40		**SANDY LEAN CLAY (CL)**- yellowish brown; moist; stiff - ALLUVIUM			UD-1 REC 88%							
45												
50		**SILTY SAND (SM)**- red and orange brown; moist to wet; medium dense to loose - ALLUVIUM	▽		2			6	7	10		17
55					3			2	4	5		9
60		Boring Terminated at a depth of 60 feet.										

BORING LOG - TVA 11-240S.GPJ 11/10/11

NOTES:

1. *BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.*
2. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
3. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

S&ME

Appendix C – Soil Core Photographs

Table of Contents

1. Boring NRS051
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8. Boring NRS058
9. Boring NRS059
10. Boring NRS060
11. Boring NRS061
12. Boring NRS062
13. Boring NRS064
14. Boring NRS065
15. Boring NRS067
16. Boring NRS068 (Well GAF-526U)
17. Boring NRS069 (Well GAF-541U)
18. Boring NRS070

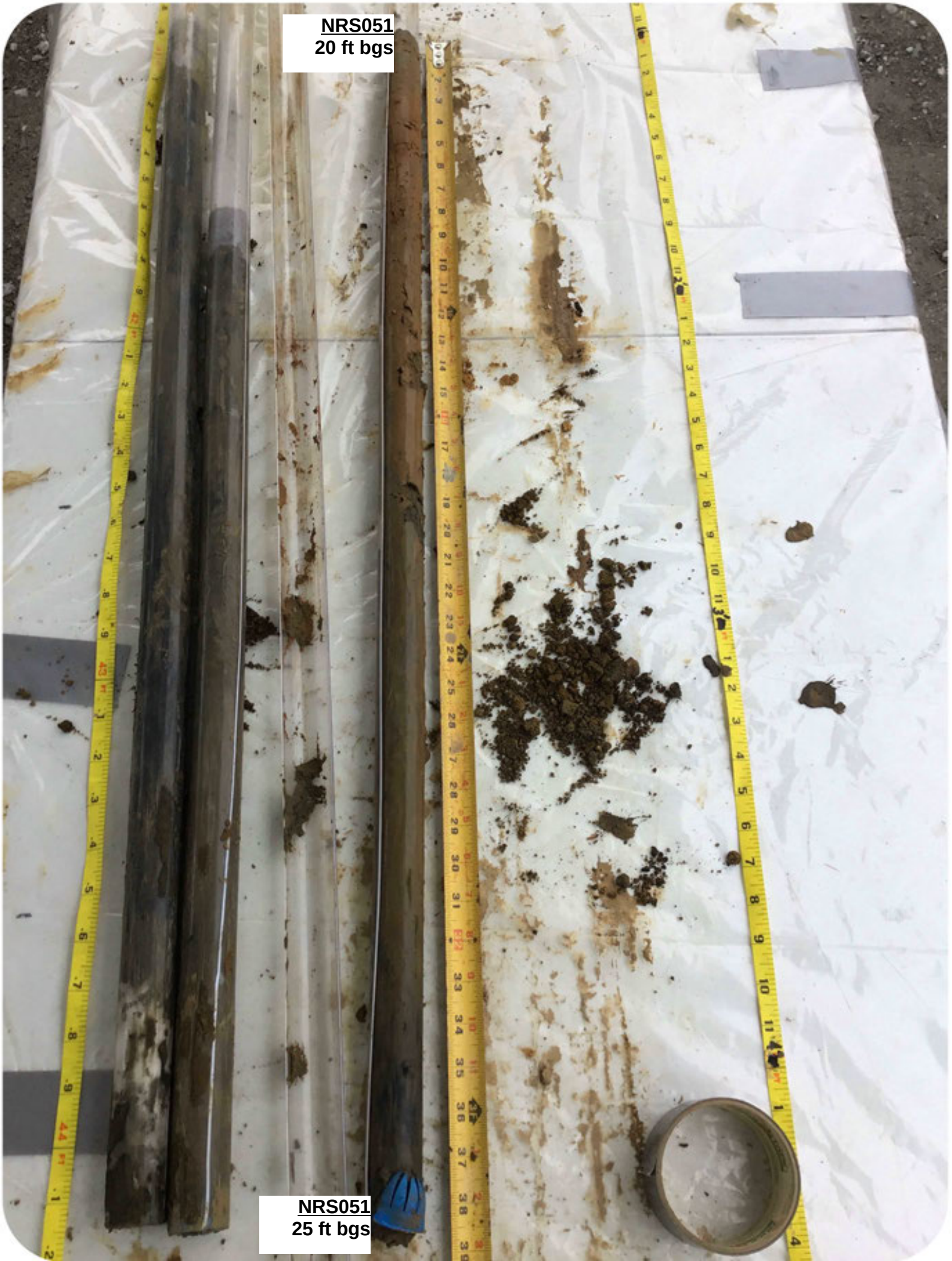
Boring NRS051

NRS051
0 ft bgs
NRS051
5 ft bgs

NRS051
5 ft bgs
NRS051
10 ft bgs

NRS051
10 ft bgs
NRS051
15 ft bgs

NRS051
15 ft bgs
NRS051
20 ft bgs


NRS051
20 ft bgs
NRS051
25 ft bgs

NRS051
25 ft bgs
NRS051
30 ft bgs

NRS051
30 ft bgs
NRS051
35 ft bgs

NRS051
35 ft bgs
NRS051
39 ft bgs
End boring

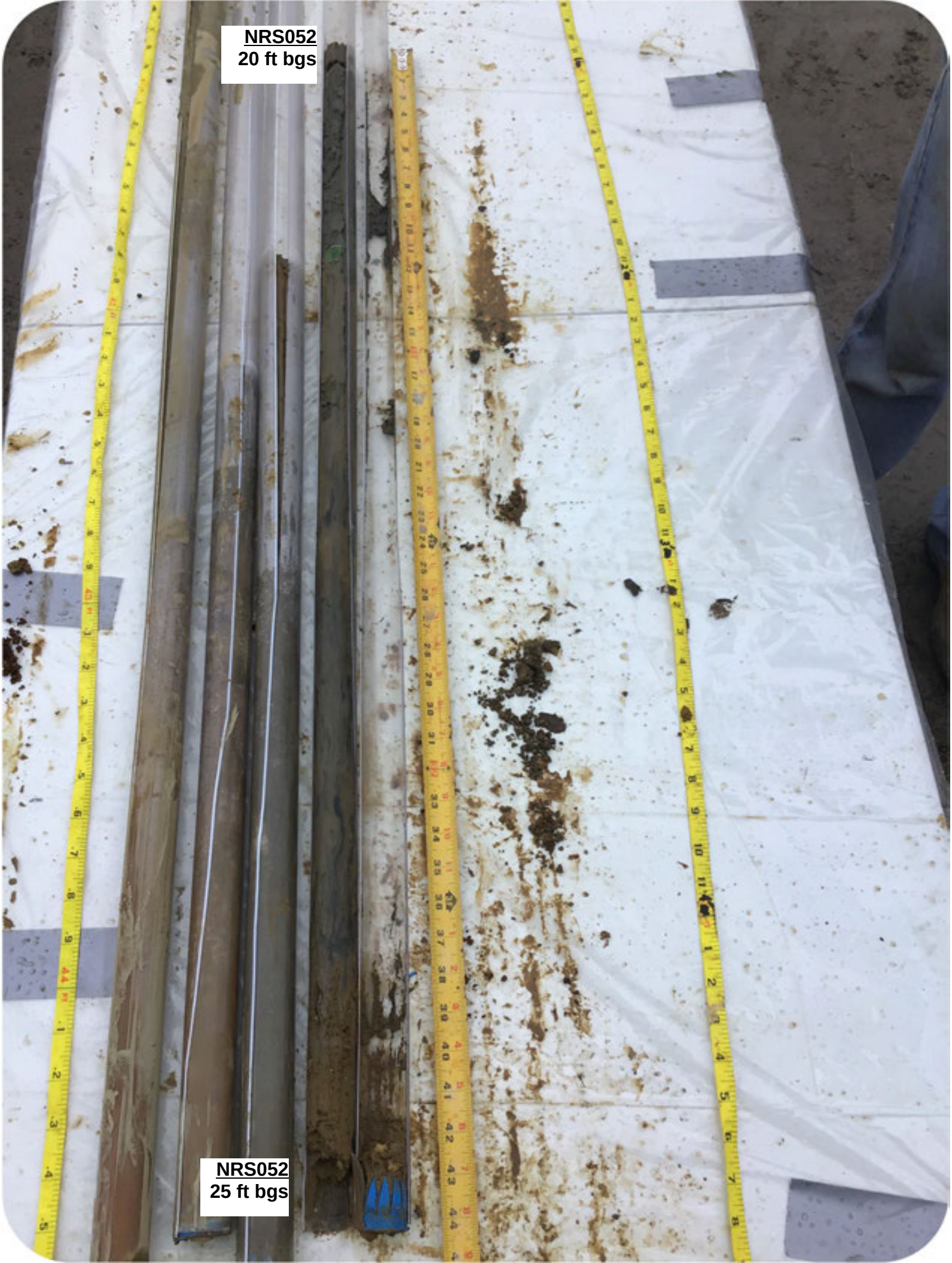
Boring NRS052

NRS052
0 ft bgs
NRS052
5 ft bgs

NRS052
5 ft bgs
NRS052
10 ft bgs

NRS052
10 ft bgs
NRS052
15 ft bgs

NRS052
15 ft bgs
NRS052
20 ft bgs


NRS052
20 ft bgs
NRS052
25 ft bgs

NRS052
25 ft bgs
NRS052
30 ft bgs

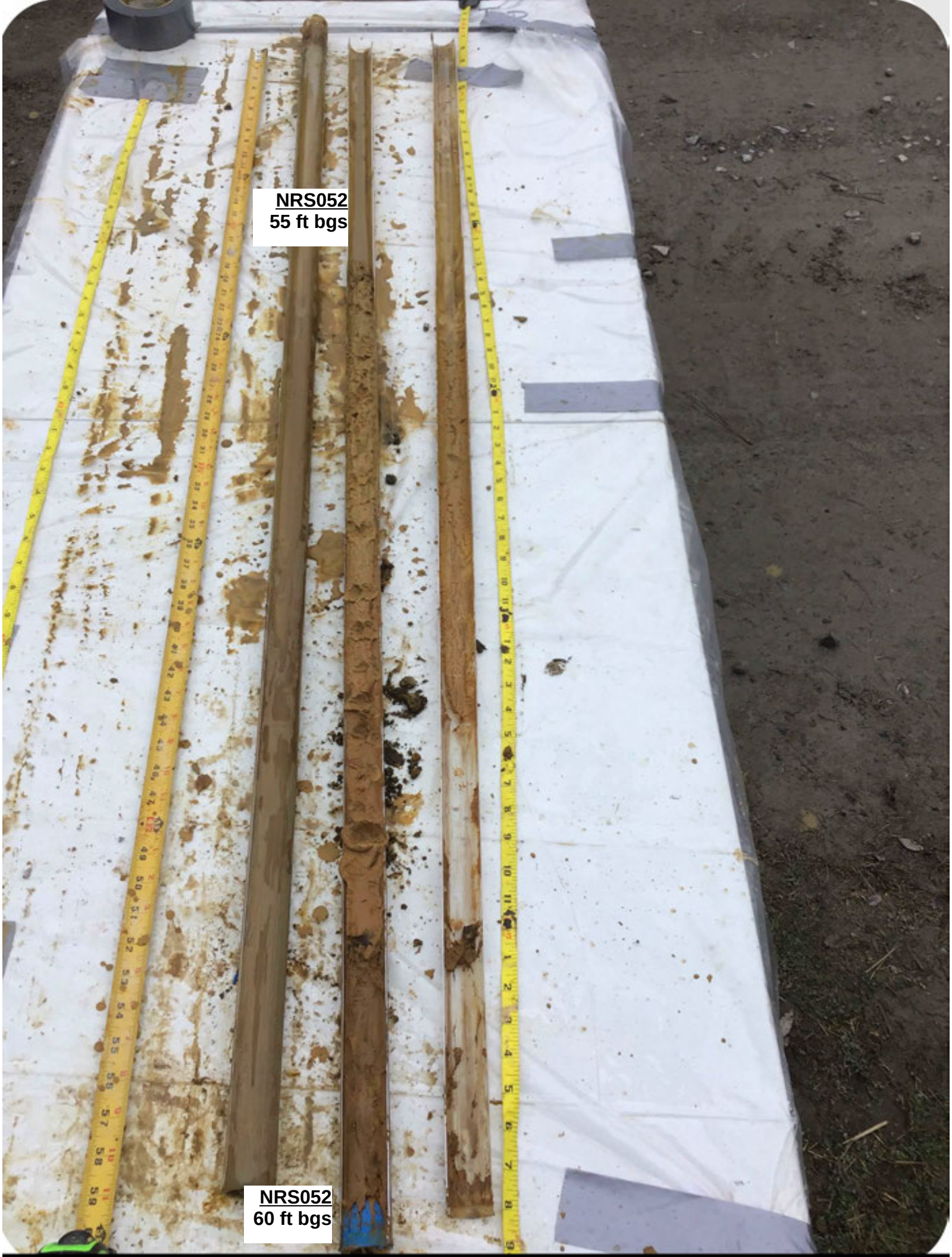
NRS052
30 ft bgs
NRS052
35 ft bgs

NRS052
35 ft bgs
NRS052
40 ft bgs

NRS052
40 ft bgs
NRS052
45 ft bgs

NRS052
45 ft bgs
NRS052
50 ft bgs

NRS052
50 ft bgs
NRS052
55 ft bgs


NRS052
55 ft bgs
NRS052
60 ft bgs

NRS052
60 ft bgs
NRS052
65 ft bgs
End boring

Boring NRS053

NRS053
0 ft bgs
NRS053
5 ft bgs

NRS053
5 ft bgs
NRS053
10 ft bgs

NRS053
10 ft bgs
NRS053
15 ft bgs

NRS053
15 ft bgs
NRS053
20 ft bgs

NRS053
20 ft bgs
NRS053
25 ft bgs

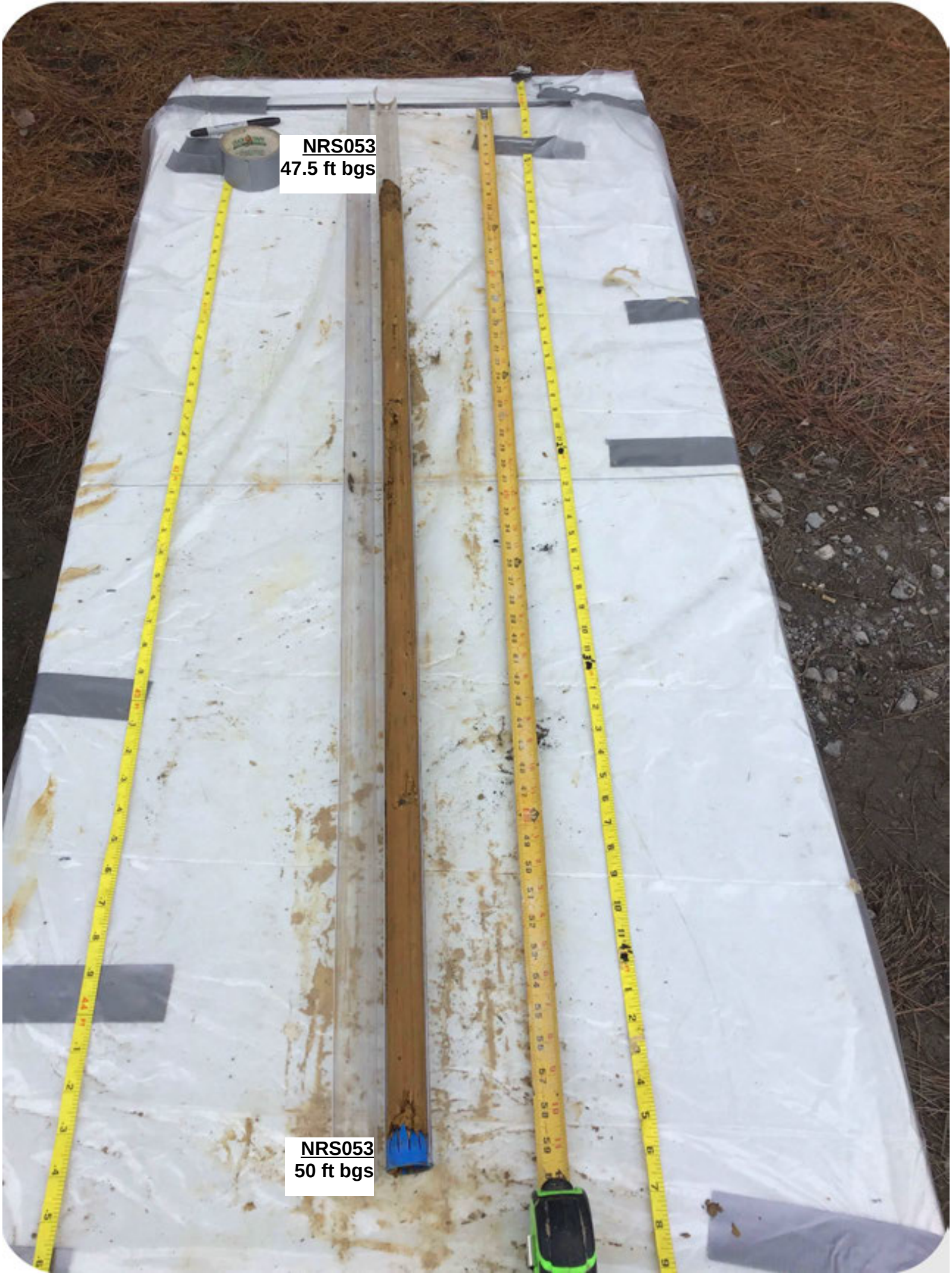
NRS053
25 ft bgs
NRS053
30 ft bgs

NRS053
30 ft bgs
NRS053
35 ft bgs

NRS053
35 ft bgs
NRS053
40 ft bgs

NRS053
40 ft bgs
NRS053
45 ft bgs

NRS053
45 ft bgs
NRS053
47.5 ft bgs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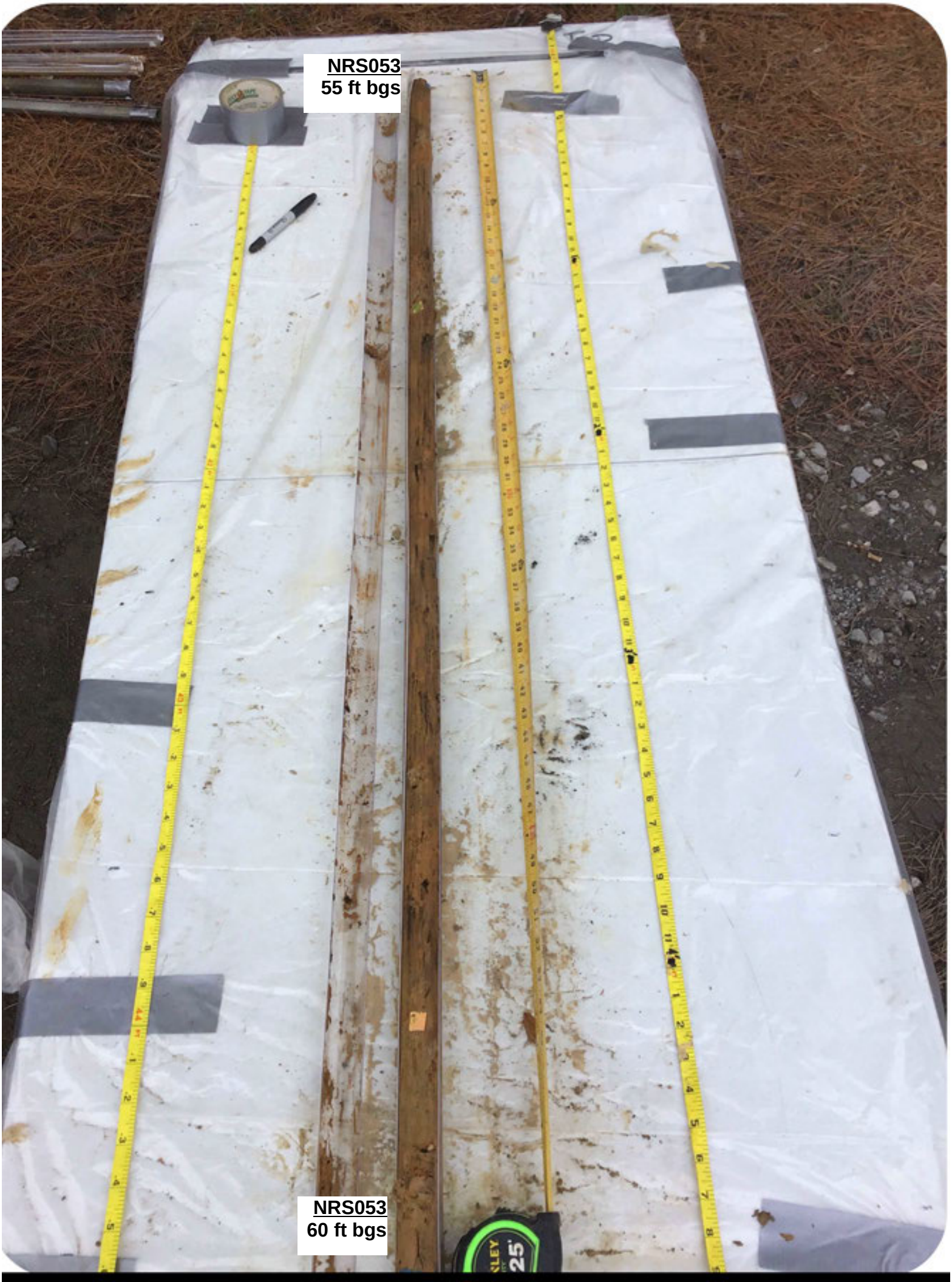
47.5 ft bgs
NRS053
50 ft bgs

NRS053
50 ft bgs
NRS053
55 ft bgs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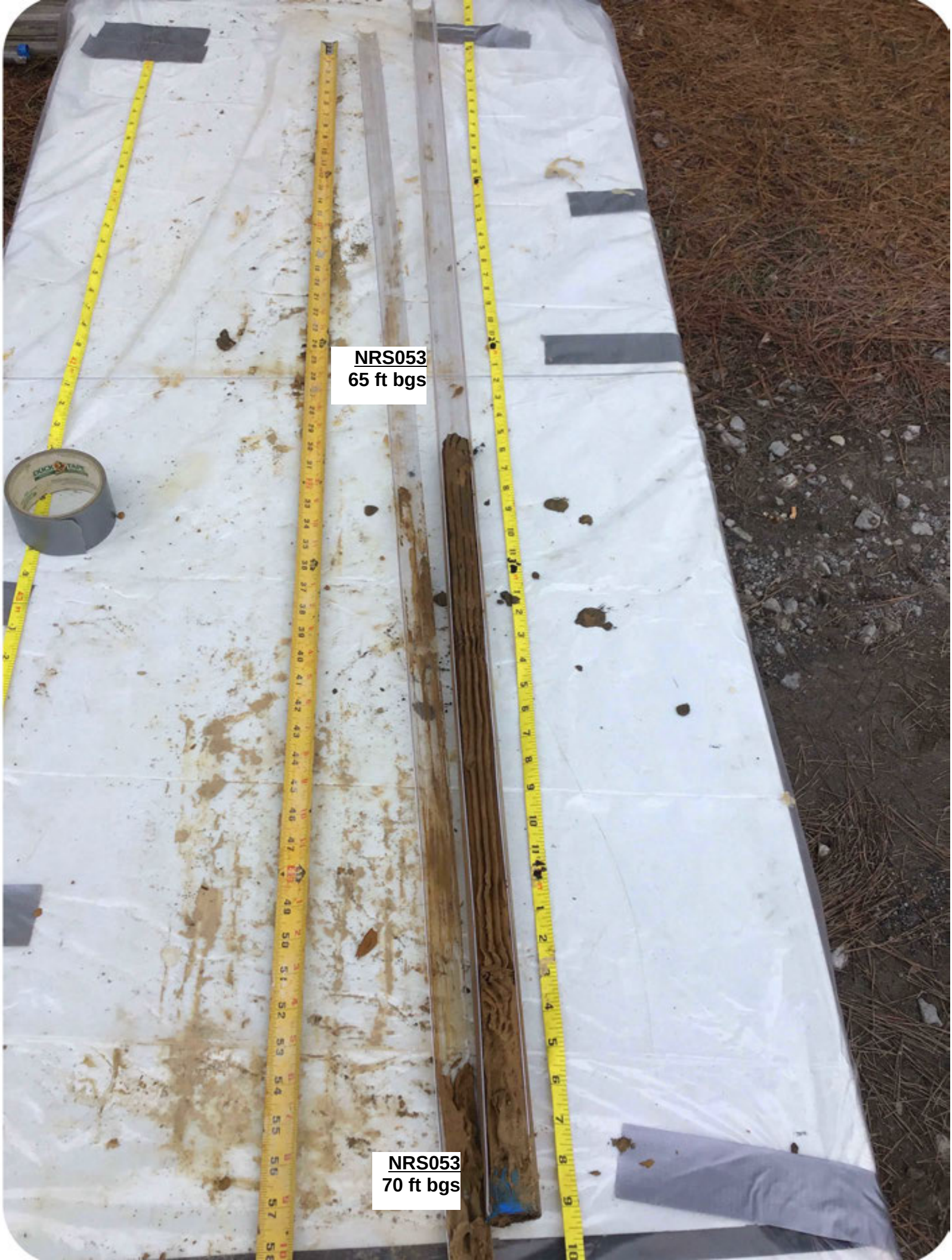
55 ft bgs
NRS053
60 ft bgs

NRS053
60 ft bgs
NRS053
65 ft bgs


NRS053
65 ft bgs
NRS053
70 ft bgs

NRS053
70 ft bgs
NRS053
72 ft bgs
End of boring

Boring NRS054

NRS054
0 ft bgs

NRS054
5 ft bgs

STANLEY
25'

Kimberly-Clark
PURPLE NITRILE
Powder-Free
Exam Gloves
XL
KC500

NRS054
5 ft bgs

NRS054
10 ft bgs

NRS054
10 ft bgs

NRS054
15 ft bgs

Kimberly-Clark
PURPLE NITRILE
Powder-Free
Exam Gloves
XL
KC500

NRS054
15 ft bgs
NRS054
20 ft bgs
Kimberly-Clark

NRS054
20 ft bgs
NRS054
25 ft bgs
Powder-free
Exam Gloves

NRS054
25 ft bgs

NRS054
30 ft bgs

Kimberly-Clark
PURPLE NITRILE
Powder-Free
Exam Gloves
XL
KC500

NRS054
30 ft bgs
NRS054
35 ft bgs
Kimberly-Clark
XL
KC500

NRS054
35 ft bgs
NRS054
40 ft bgs
Kimberly-Clark

NRS054
40 ft bgs
NRS054
42.5 ft bgs
Kimberly-Clark
XL
KC500

NRS054
42.5 ft bgs
NRS054
45 ft bgs
Kimberly-Clark
XL

NRS054
45 ft bgs
NRS054
47.5 ft bgs
Kimberly-Clark
XL
KC500

NRS054
47.5 ft bgs
NRS054
50 ft bgs
Kimberly-Clark
XL
KC500

NRS054
50 ft bgs
NRS054
52.5 ft bgs
Kimberly-Clark
Purple Nitrile
Powder-Free
Exam Gloves

NRS054
52.5 ft bgs
NRS054
55 ft bgs
Kimberly-Clark
Purple Nitrile
Powder-Free
Exam Gloves

NRS054
55 ft bgs

NRS054
57.5 ft bgs

Kimberly-Clark
PURPLE NITRILE
Powder-Free
Exam Gloves

NRS054
57.5 ft bgs
NRS054
60 ft bgs
Kimberly-Clark
Purple Nitrile
Powder-Free
Exam Gloves

NRS054
60 ft bgs
NRS054
65 ft bgs
Kimberly-Clark
PURPLE NITRILE
Powder-Free
Exam Gloves
XL
KC500

NRS054
65 ft bgs
NRS054
66 ft bgs
End boring
Kimberly-Clark
Powder-Free
Exam Gloves
XL
KC500

Boring NRS055

NRS055
0 ft bgs
NRS055
5 ft bgs
Kimberly-Clark
Purple Nitrile
Powder-Free
Exam Gloves

NRS055
5 ft bgs
NRS055
10 ft bgs

NRS055
10 ft bgs
NRS055
15 ft bgs
Purple Nitrile
Powder-Free
Exam Gloves
Kimberly-Clark

NRS055
15 ft bgs
NRS055
20 ft bgs

NRS055
20 ft bgs

NRS055
25 ft bgs

Kimberly-Clark
PURPLE NITRILE
Powder-Free
Exam Gloves

NRS055
25 ft bgs
NRS055
30 ft bgs
Purple Nitrile
Powder-Free
Exam Gloves
Kimberly-Clark

NRS055
30 ft bgs
NRS055
35 ft bgs

NRS055
35 ft bgs
NRS055
40 ft bgs
Kimberly-Clark
PURPLE NITRILE

NRS055
40 ft bgs
NRS055
45 ft bgs
Kimberly-Clark

NRS055
45 ft bgs
NRS055
50 ft bgs
Kimberly-Clark
Purple Nitrile
Powder-Free
Exam Gloves

NRS055
50 ft bgs
NRS055
55 ft bgs
Kimberly-Clark
Purple Nitrile
Powder-free
Exam Gloves

NRS055
55 ft bgs
NRS055
60 ft bgs
Kimberly-Clark
Purple Nitrile

NRS055
60 ft bgs
NRS055
65 ft bgs
Kimberly-Clark
XL

NRS055
65 ft bgs
NRS055
70 ft bgs
End boring
Kimberly-Clark
PURPLE NITRILE
Powder-Free
Exam Gloves

Boring NRS056

NRS056
0 ft bgs
NRS056
5 ft bgs
Kimberly-Clark
PURPLE NITRILE
XL

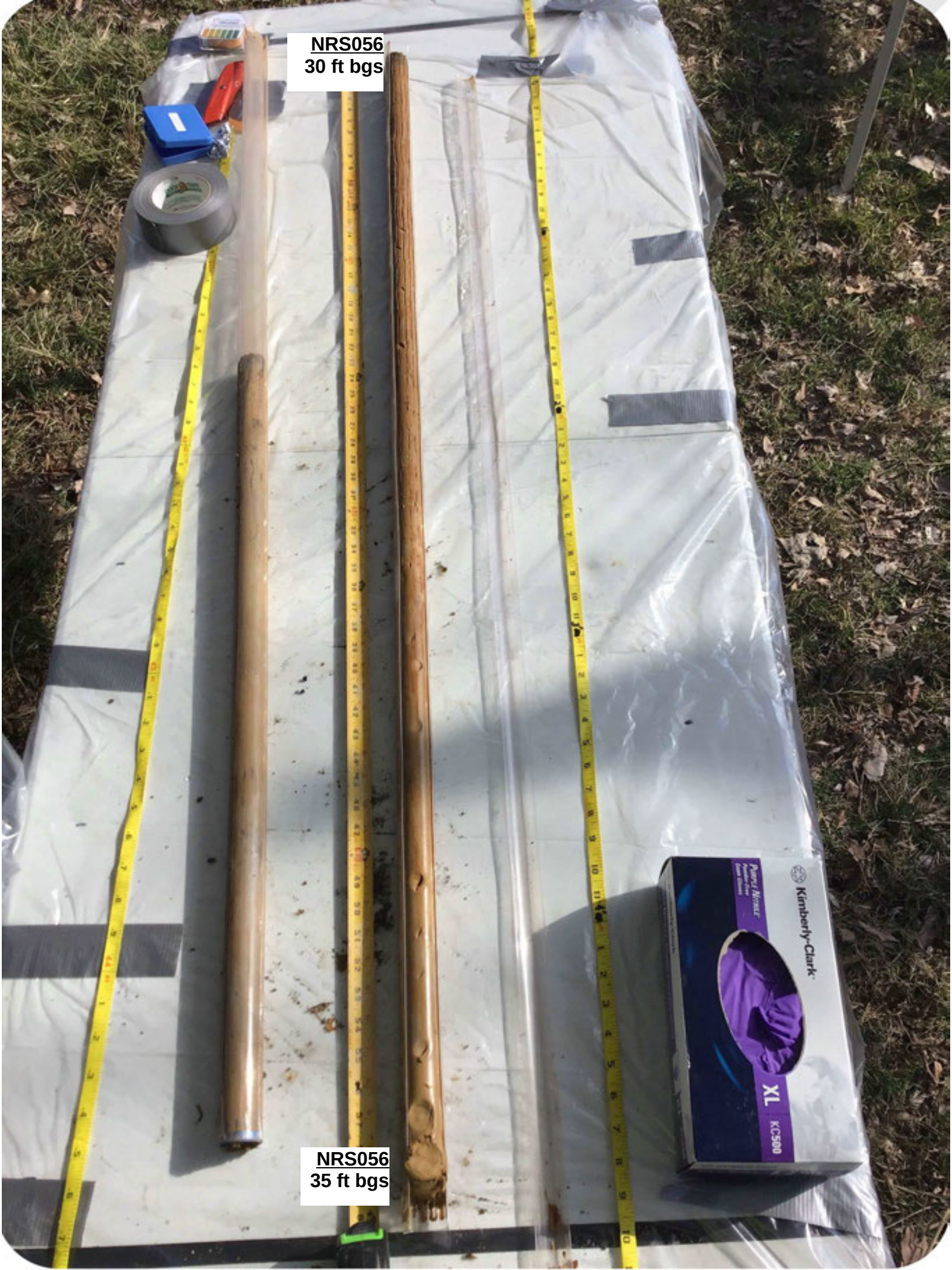
NRS056
5 ft bgs
NRS056
10 ft bgs
Kimberly-Clark
PURPLE NITRILE Powder Free Exam

NRS056
10 ft bgs
NRS056
15 ft bgs

NRS056
15 ft bgs
NRS056
20 ft bgs
Kimberly-Clark
XL
KC500

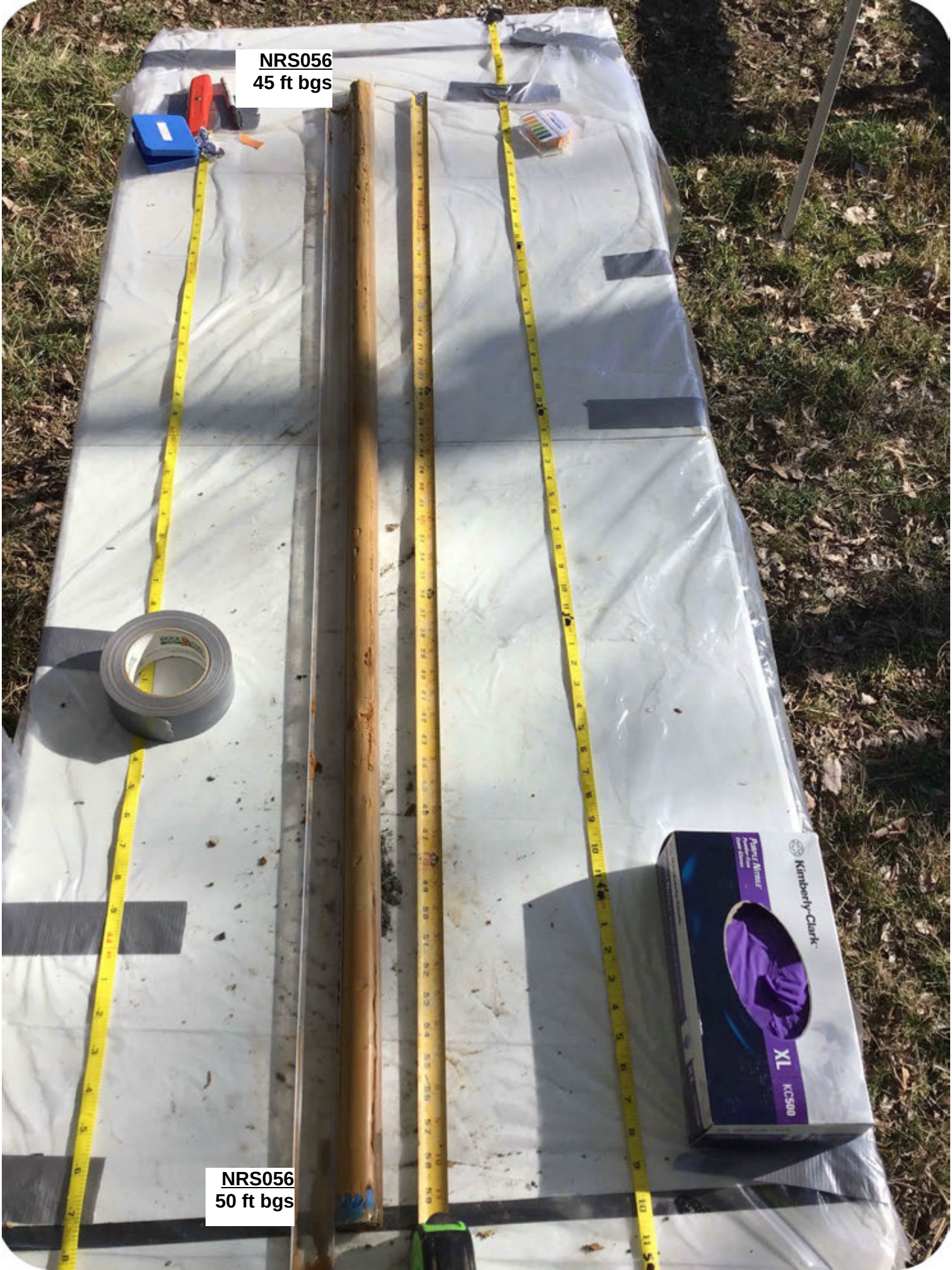
NRS056
20 ft bgs
NRS056
25 ft bgs

NRS056
25 ft bgs
NRS056
30 ft bgs
Kimberly-Clark
XL
KC500


NRS056
30 ft bgs
NRS056
35 ft bgs
Kimberly-Clark
XL
KC500

NRS056
35 ft bgs
NRS056
40 ft bgs
Kimberly-Clark
XL
KC500

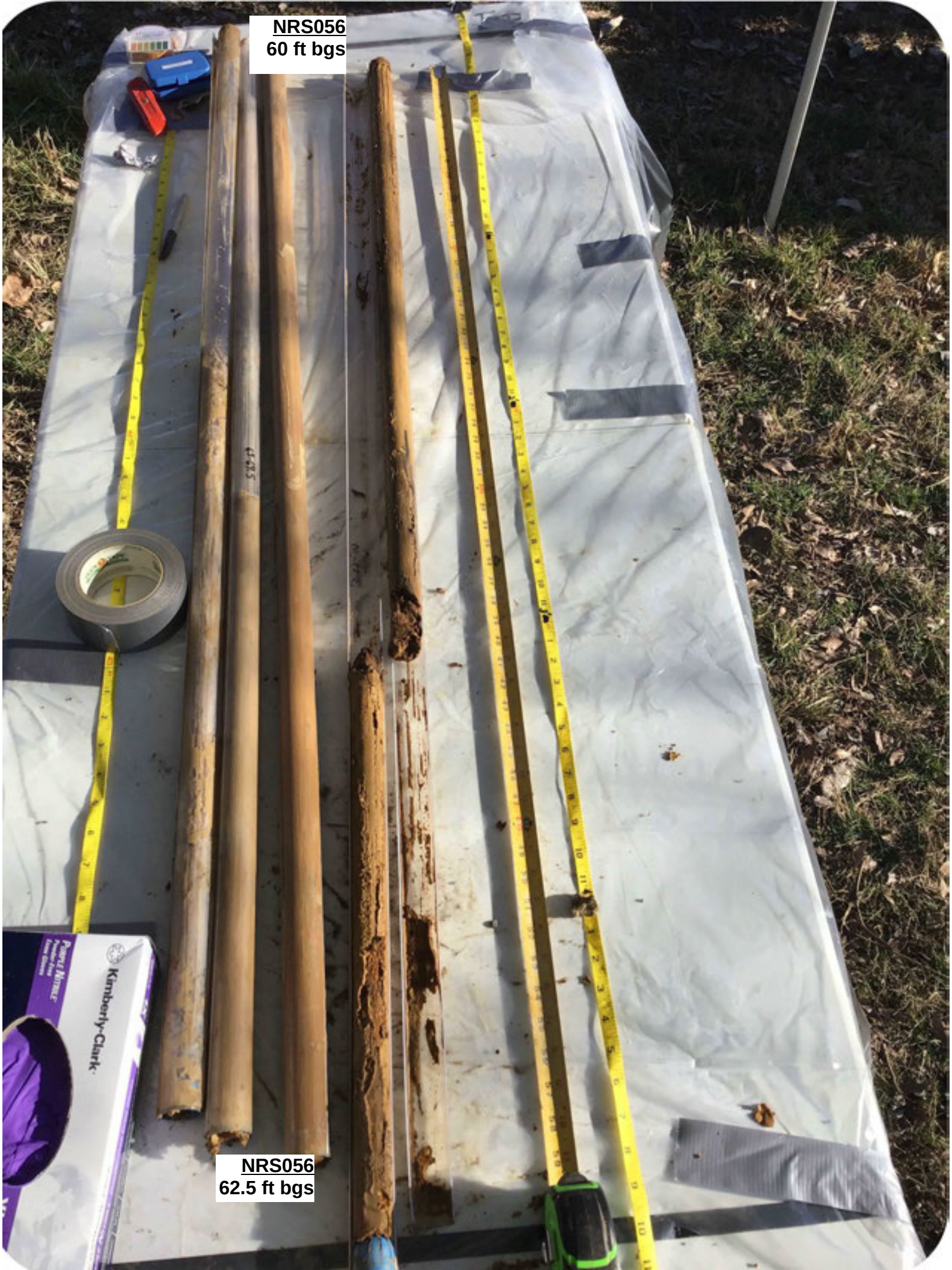
NRS056
40 ft bgs
NRS056
45 ft bgs
Kimberly-Clark
XL
KC500

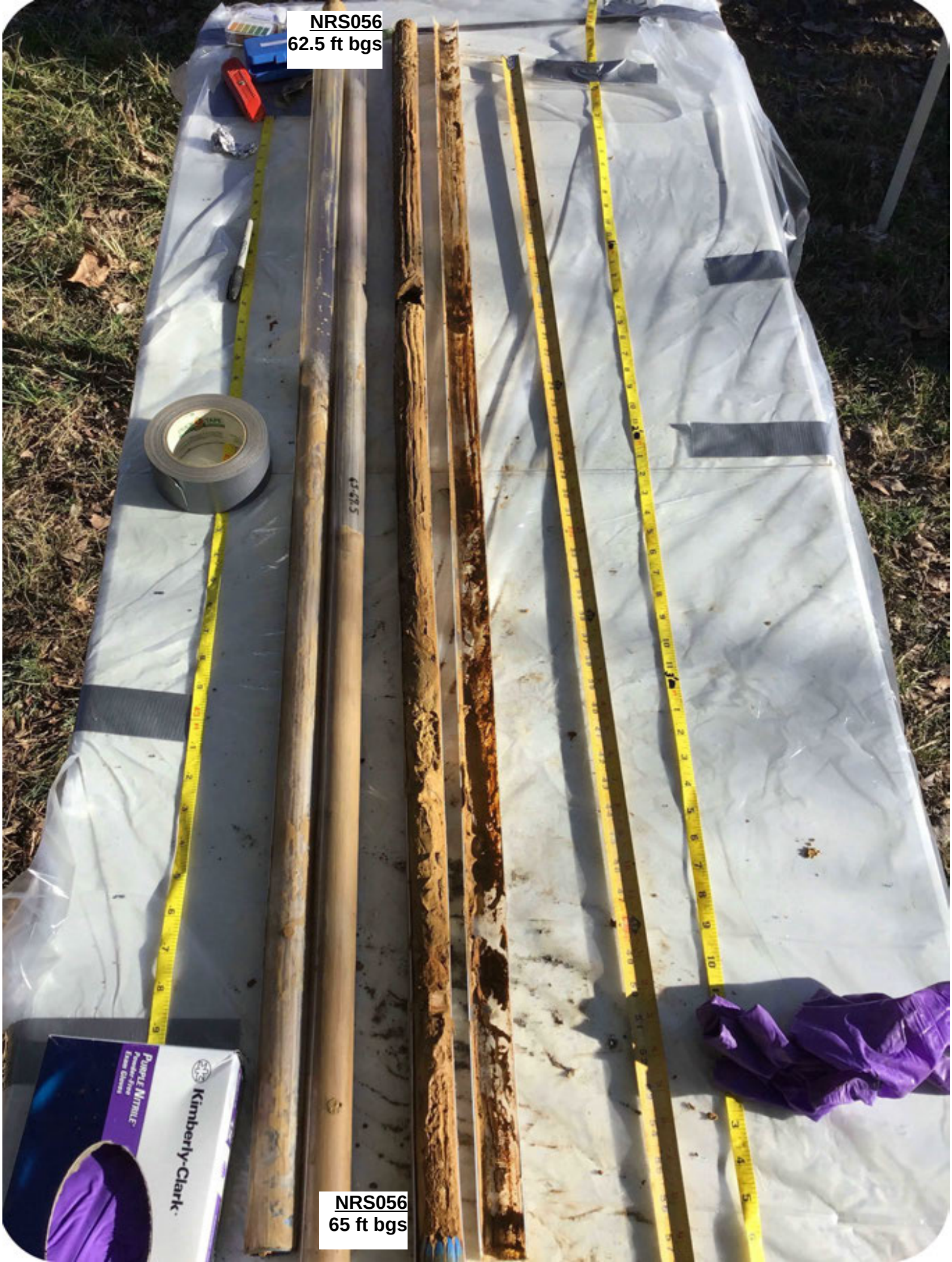

NRS056
45 ft bgs
NRS056
50 ft bgs
Kimberly-Clark
XL
KC500

NRS056
50 ft bgs
NRS056
55 ft bgs
Kimberly-Clark

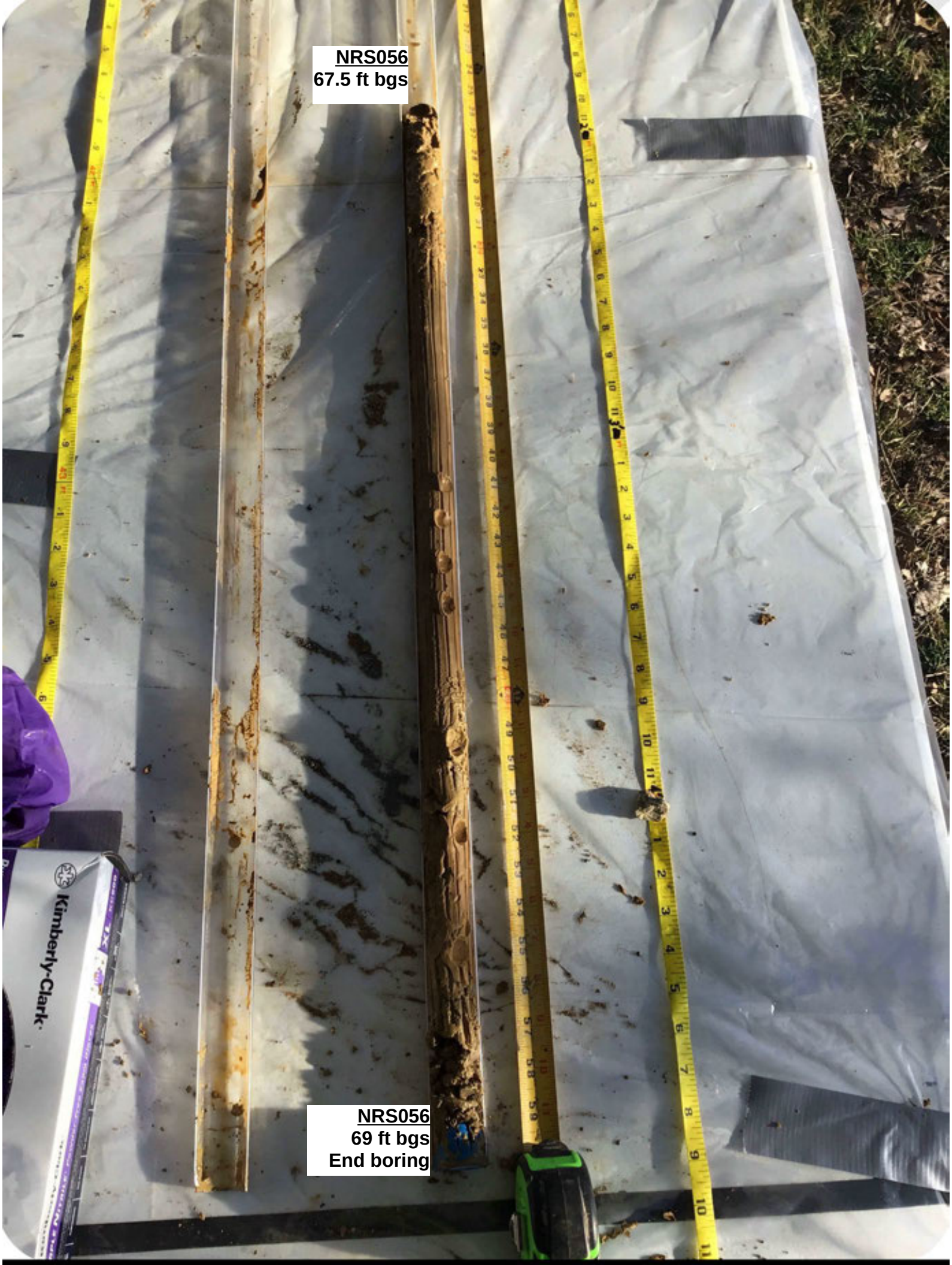
NRS056
55 ft bgs
NRS056
58 ft bgs
Kimberly-Clark

NRS056
58 ft bgs
NRS056
60 ft bgs
Kimberly-Clark
XL


NRS056
60 ft bgs
NRS056
62.5 ft bgs
Kimberly-Clark


NRS056
62.5 ft bgs
NRS056
65 ft bgs
Kimberly-Clark

NRS056
65 ft bgs
NRS056
67.5 ft bgs
Kimberly-Clark


NRS056
67.5 ft bgs
NRS056
69 ft bgs
End boring
Kimberly-Clark

Boring NRS057

NRS057
0 ft bgs
NRS057
5 ft bgs

NRS057
5 ft bgs
NRS057
10 ft bgs

NRS057
10 ft bgs
NRS057
15 ft bgs

NRS057
15 ft bgs
NRS057
20 ft bgs

NRS057
20 ft bgs
NRS057
25 ft bgs

NRS057
25 ft bgs
NRS057
30 ft bgs

NRS057
30 ft bgs
NRS057
35 ft bgs

NRS057
35 ft bgs
NRS057
40 ft bgs

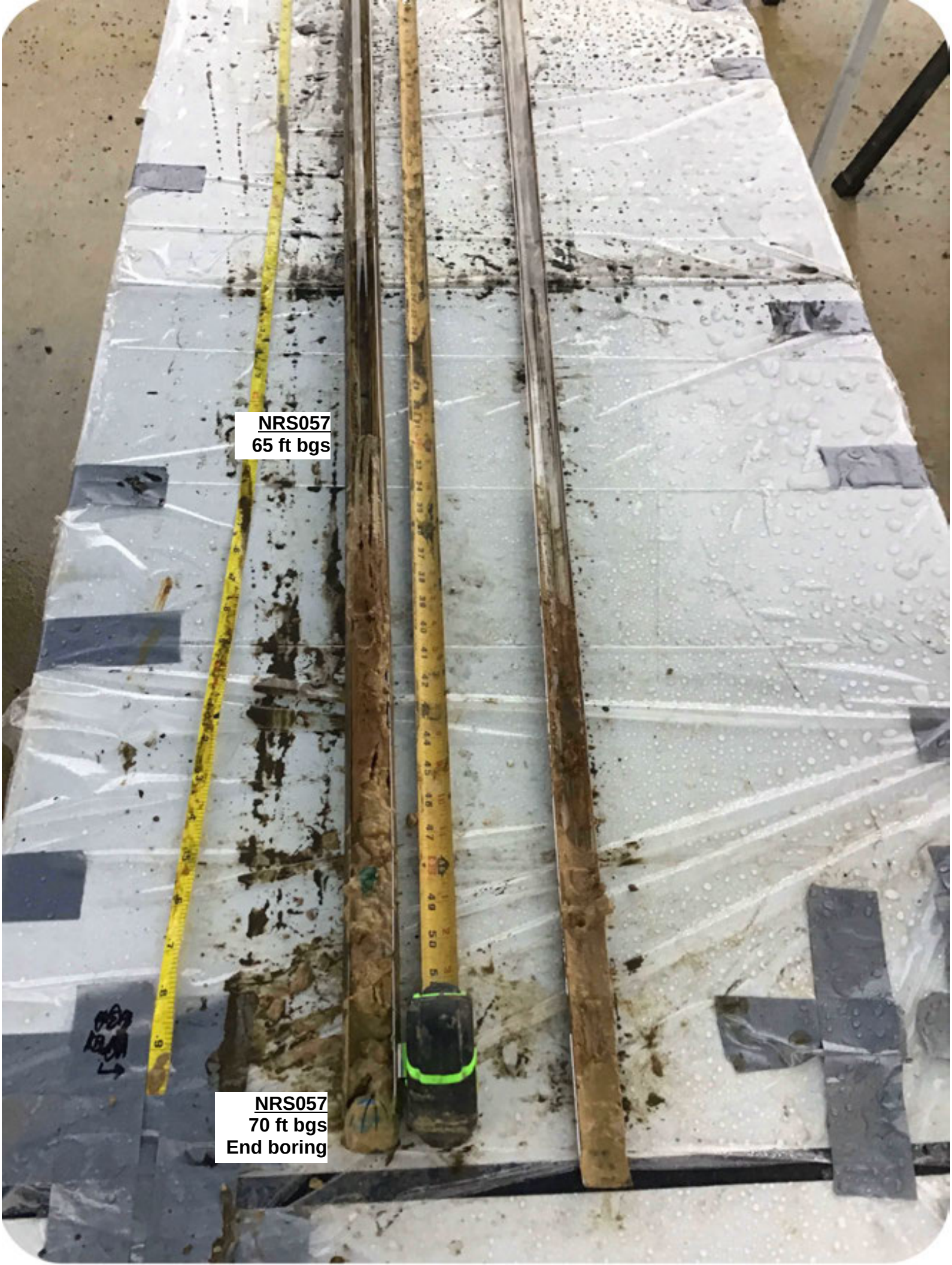
NRS057
40 ft bgs
NRS057
45 ft bgs

NRS057
45 ft bgs
NRS057
50 ft bgs

NRS057
50 ft bgs
NRS057
55 ft bgs

NRS057
55 ft bgs
NRS057
60 ft bgs

NRS057
60 ft bgs
NRS057
65 ft bgs


NRS057
65 ft bgs
NRS057
70 ft bgs
End boring

Boring NRS058

NRS058
0 ft bgs
NRS058
5 ft bgs

NRS058
5 ft bgs
NRS058
10 ft bgs

NRS058
10 ft bgs
NRS058
15 ft bgs

NRS058
15 ft bgs
NRS058
20 ft bgs

NRS058
20 ft bgs
NRS058
25 ft bgs

NRS058
25 ft bgs
NRS058
30 ft bgs

NRS058
30 ft bgs
NRS058
35 ft bgs

NRS058
35 ft bgs
NRS058
40 ft bgs

NRS058
40 ft bgs
NRS058
45 ft bgs

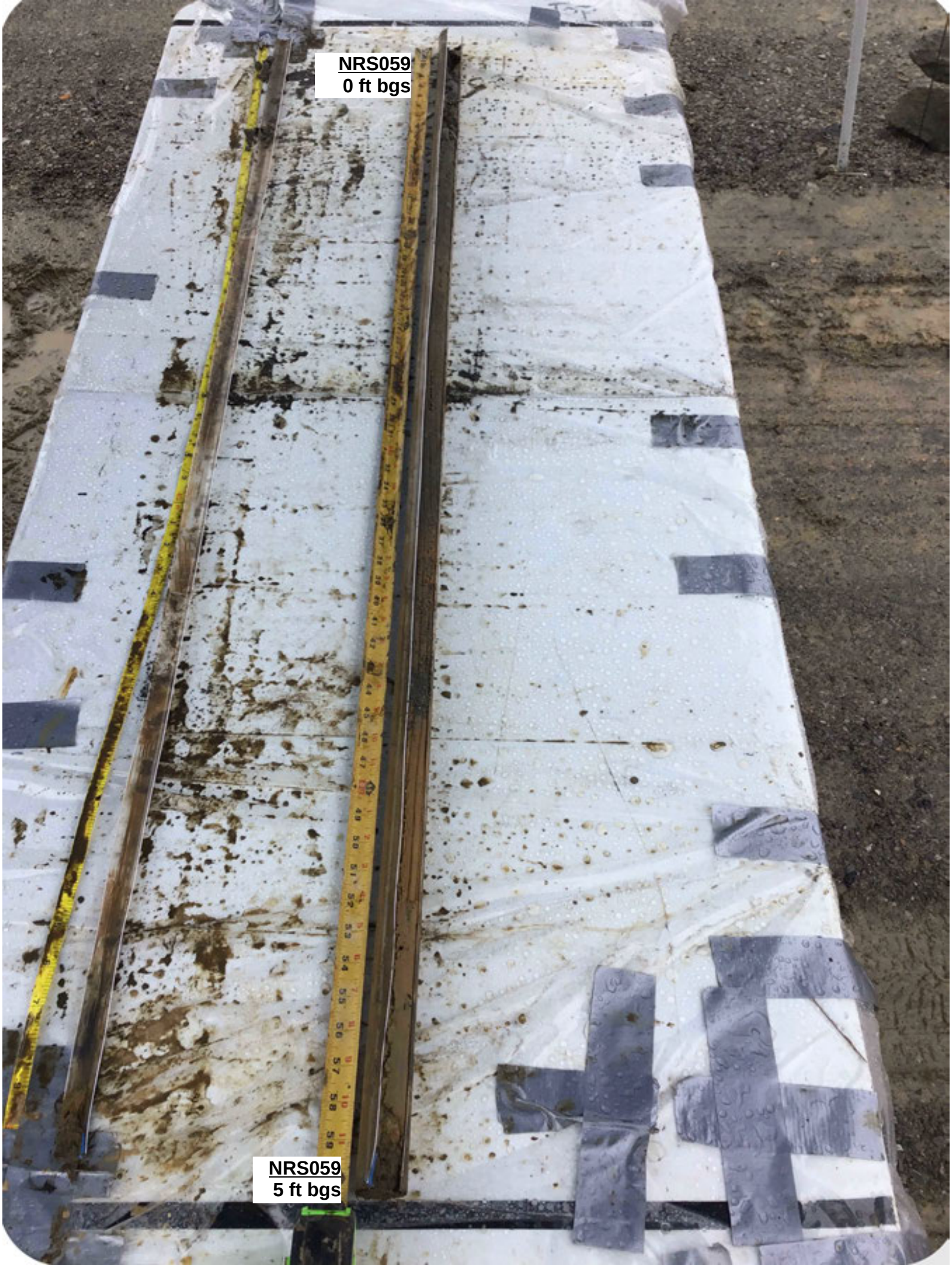
NRS058
45 ft bgs
NRS058
50 ft bgs

NRS058
50 ft bgs
NRS058
55 ft bgs

NRS058
55 ft bgs
NRS058
60 ft bgs

NRS058
60 ft bgs
NRS058
63.5 ft bgs
End boring

Boring NRS059

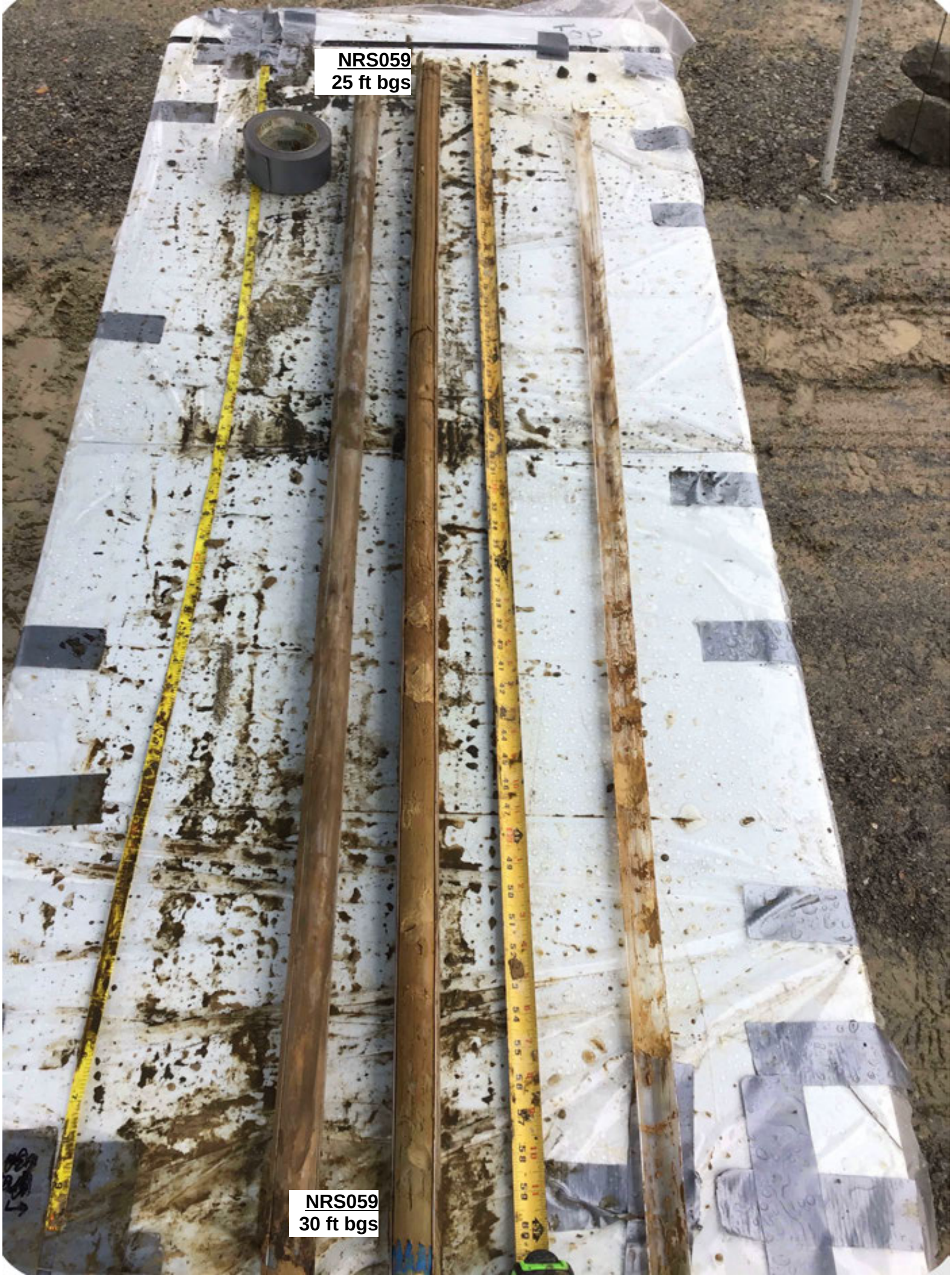

NRS059
0 ft bgs
NRS059
5 ft bgs

NRS059
5 ft bgs
NRS059
10 ft bgs

NRS059
10 ft bgs
NRS059
15 ft bgs

NRS059
15 ft bgs
NRS059
20 ft bgs

NRS059
20 ft bgs
NRS059
25 ft bgs


NRS059
25 ft bgs
NRS059
30 ft bgs

NRS059
30 ft bgs
NRS059
35 ft bgs

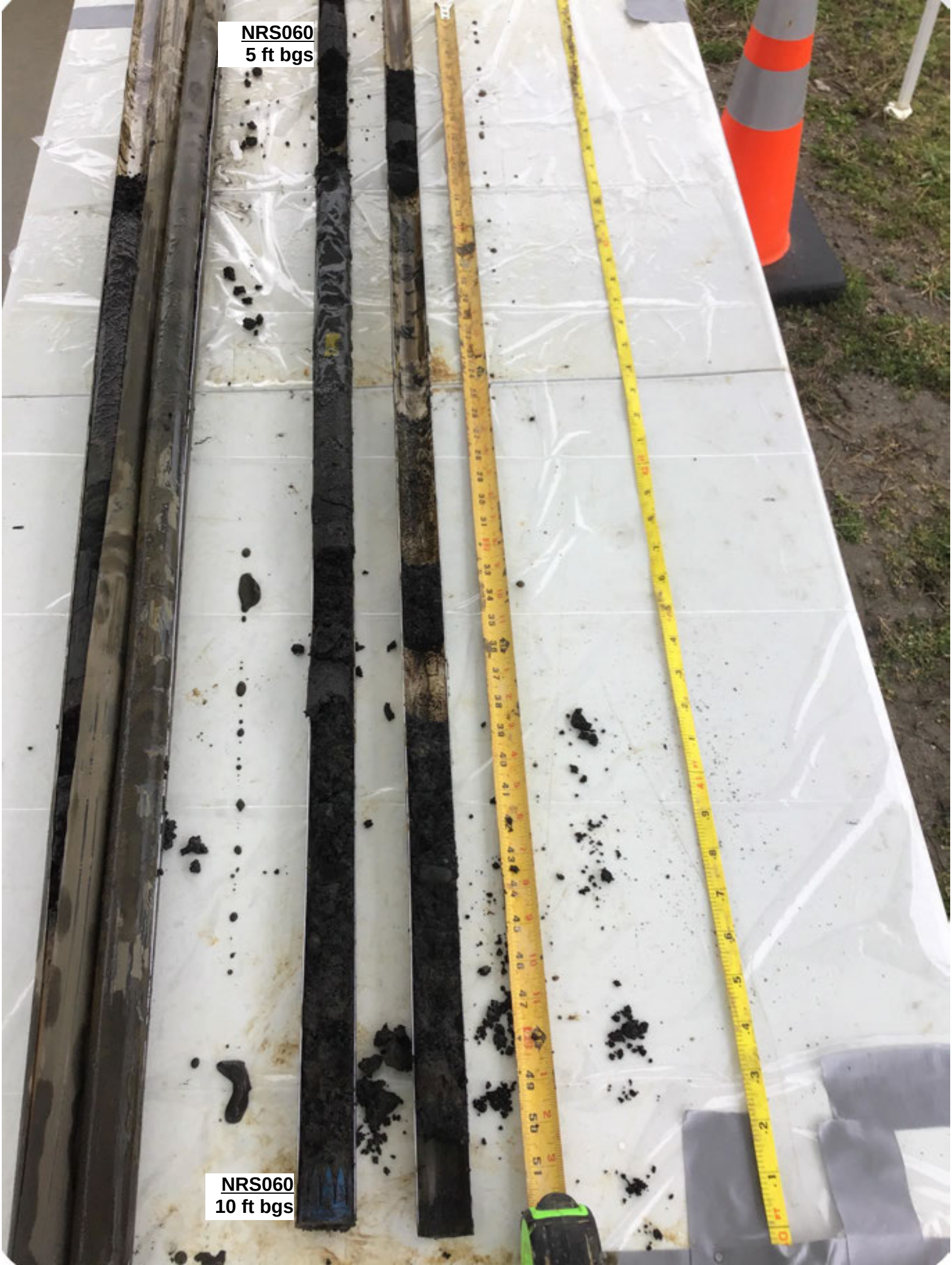
NRS059
35 ft bgs
NRS059
40 ft bgs

NRS059
40 ft bgs
NRS059
45 ft bgs

NRS059
45 ft bgs
NRS059
45.5 ft bgs
End of boring

Boring NRS060

NRS060
0 ft bgs
NRS060
5 ft bgs


NRS060
5 ft bgs
NRS060
10 ft bgs

NRS060
10 ft bgs
NRS060
15 ft bgs

NRS060
15 ft bgs
NRS060
20 ft bgs

NRS060
20 ft bgs
NRS060
25 ft bgs

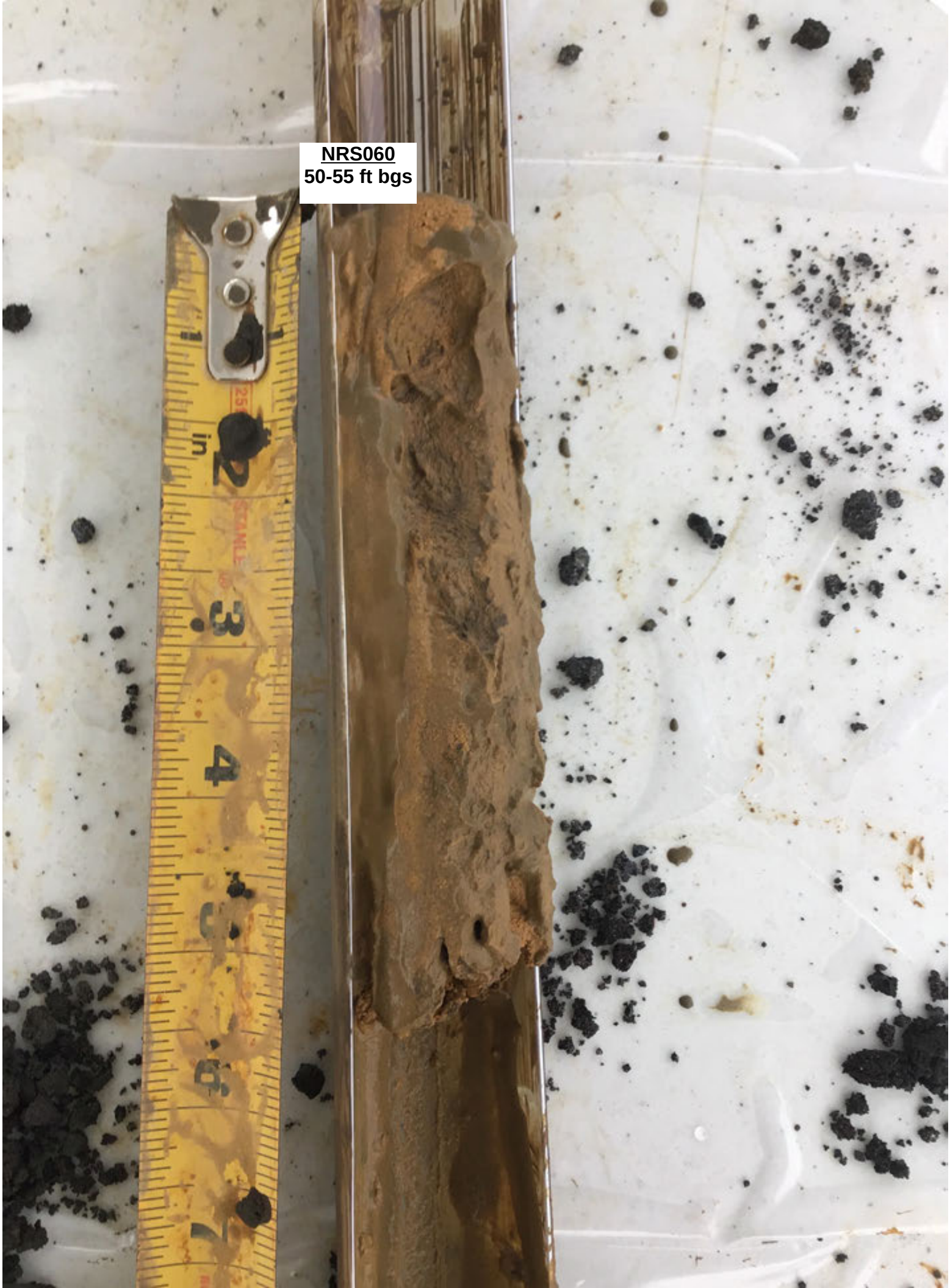
NRS060
25 ft bgs
NRS060
30 ft bgs

NRS060
30 ft bgs
NRS060
35 ft bgs

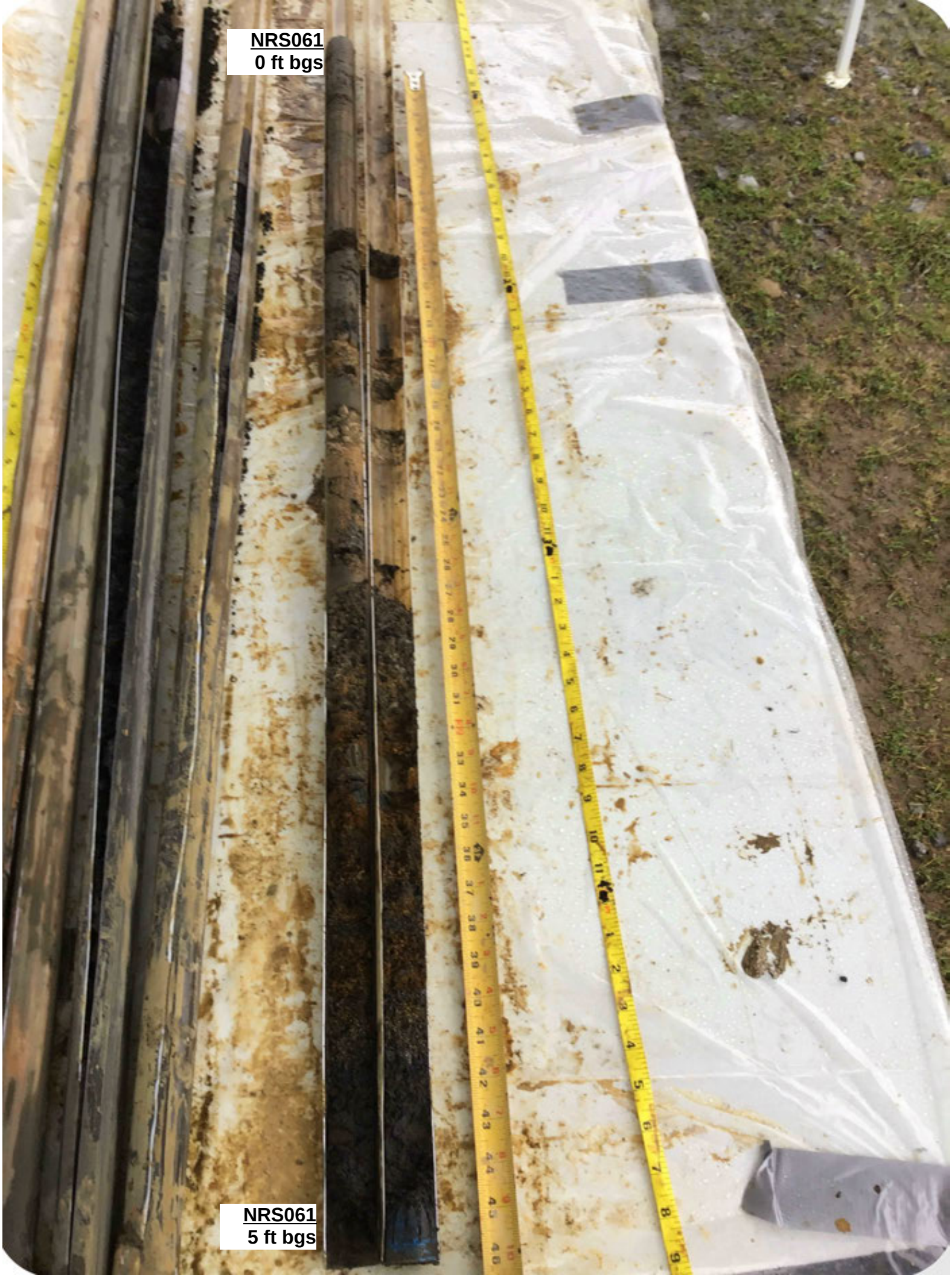
NRS060
35-40 ft bgs

NRS060
40-45 ft bgs

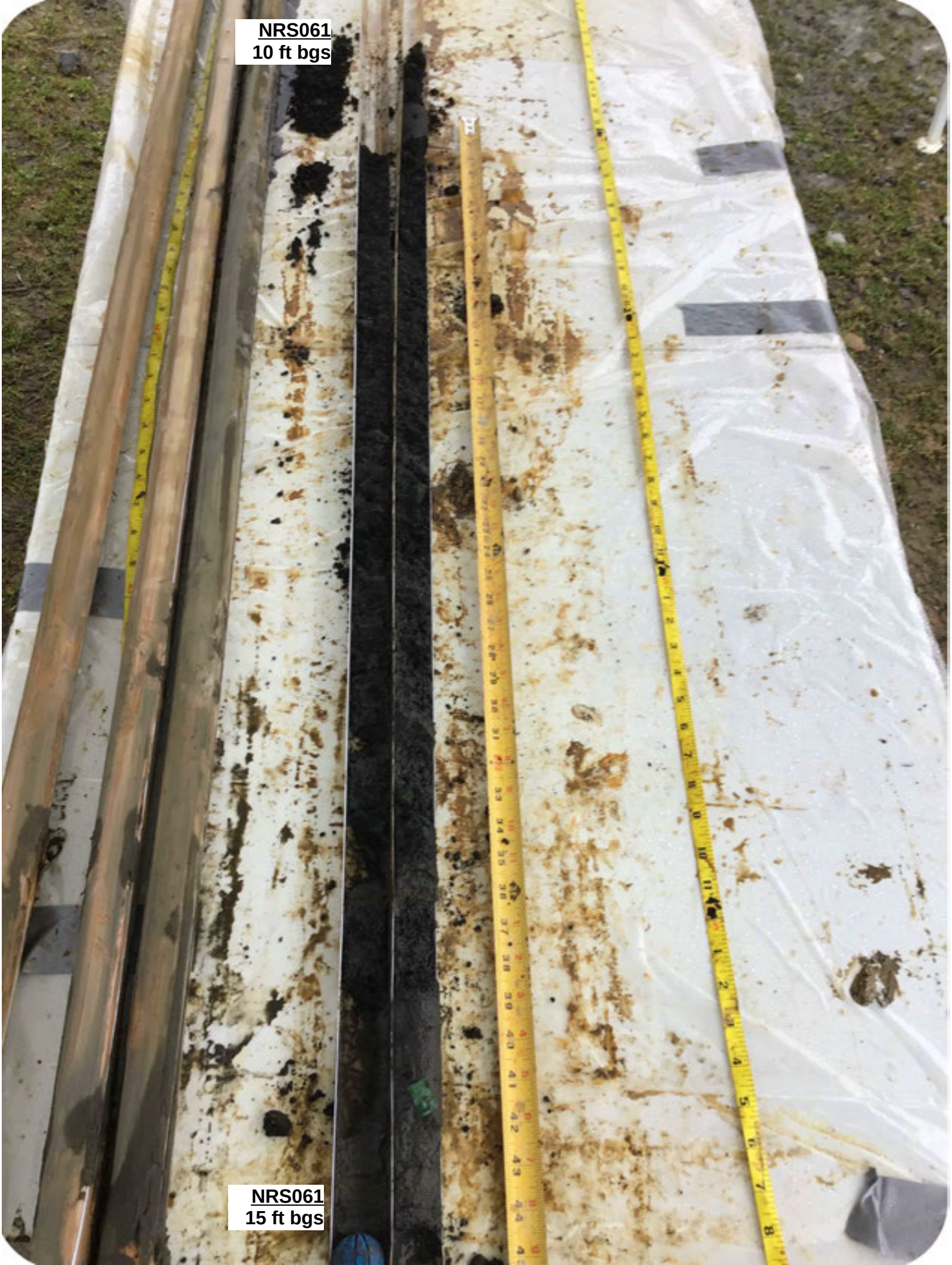
NRS060
45-50 ft bgs


NRS060
50-55 ft bgs

Boring NRS061

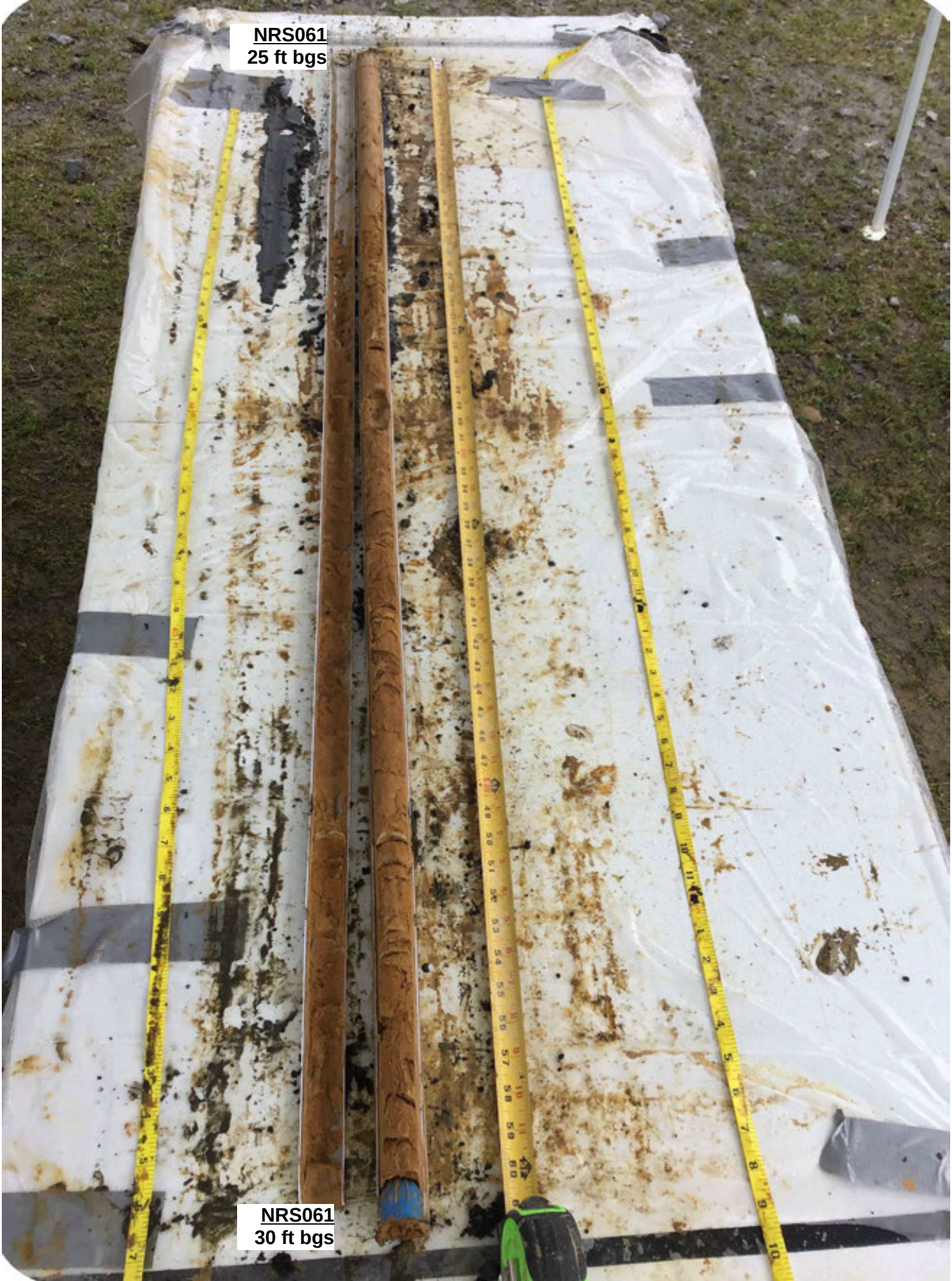

NRS061
0 ft bgs
NRS061
5 ft bgs

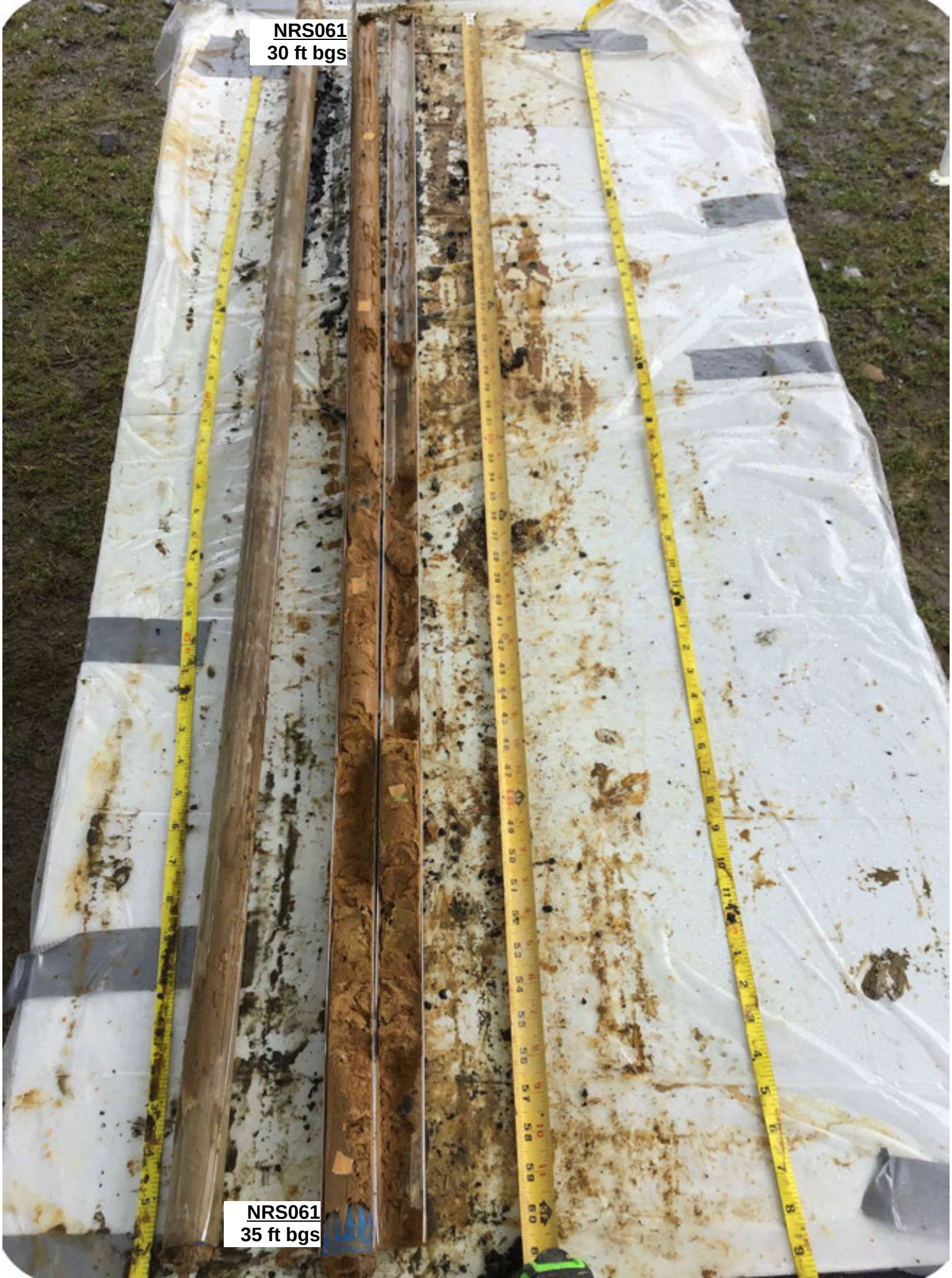
NRS061
5 ft bgs
NRS061
10 ft bgs


NRS061
10 ft bgs
NRS061
15 ft bgs

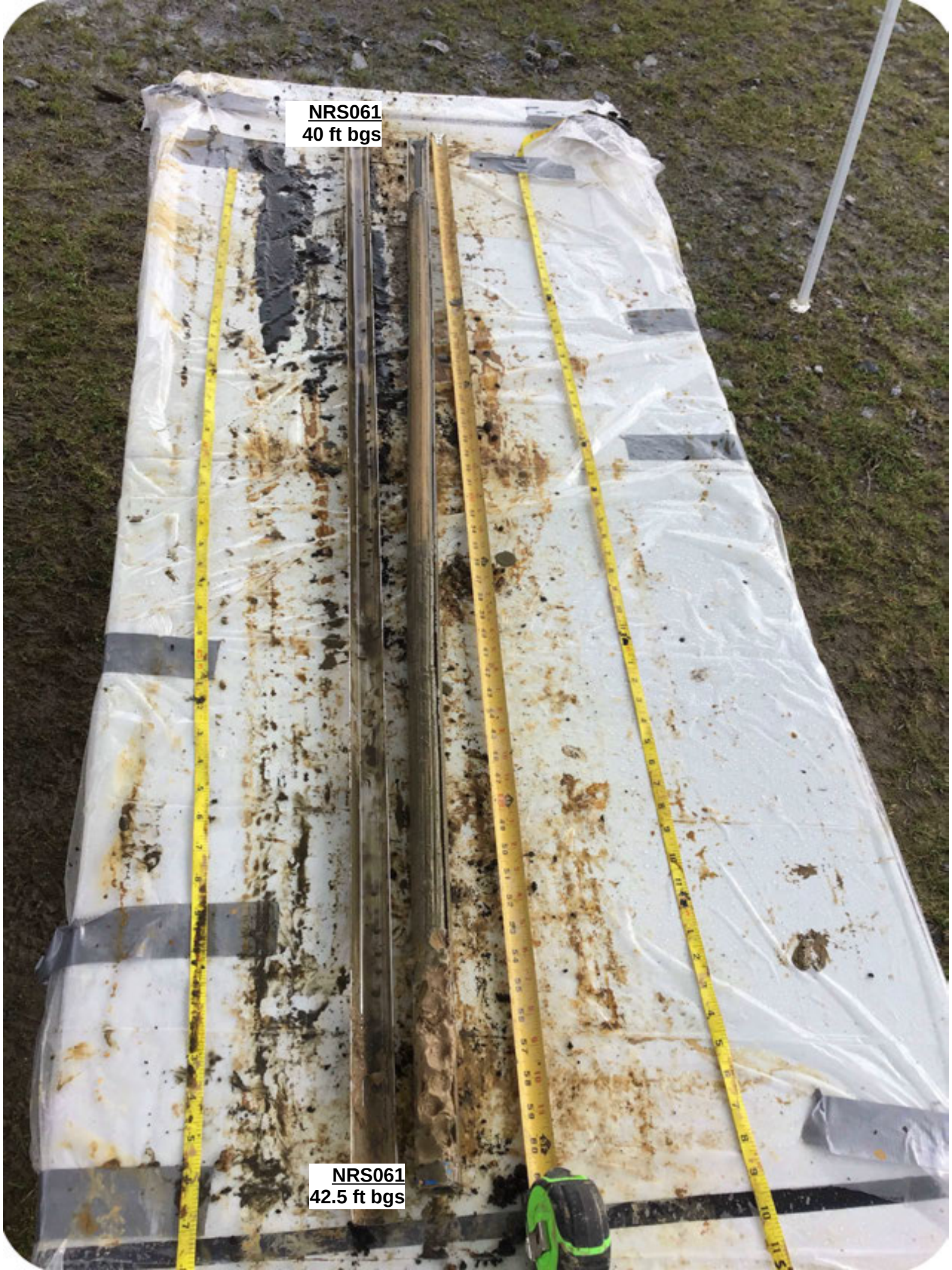
NRS061
15 ft bgs
NRS061
20 ft bgs

NRS061
20 ft bgs
NRS061
25 ft bgs

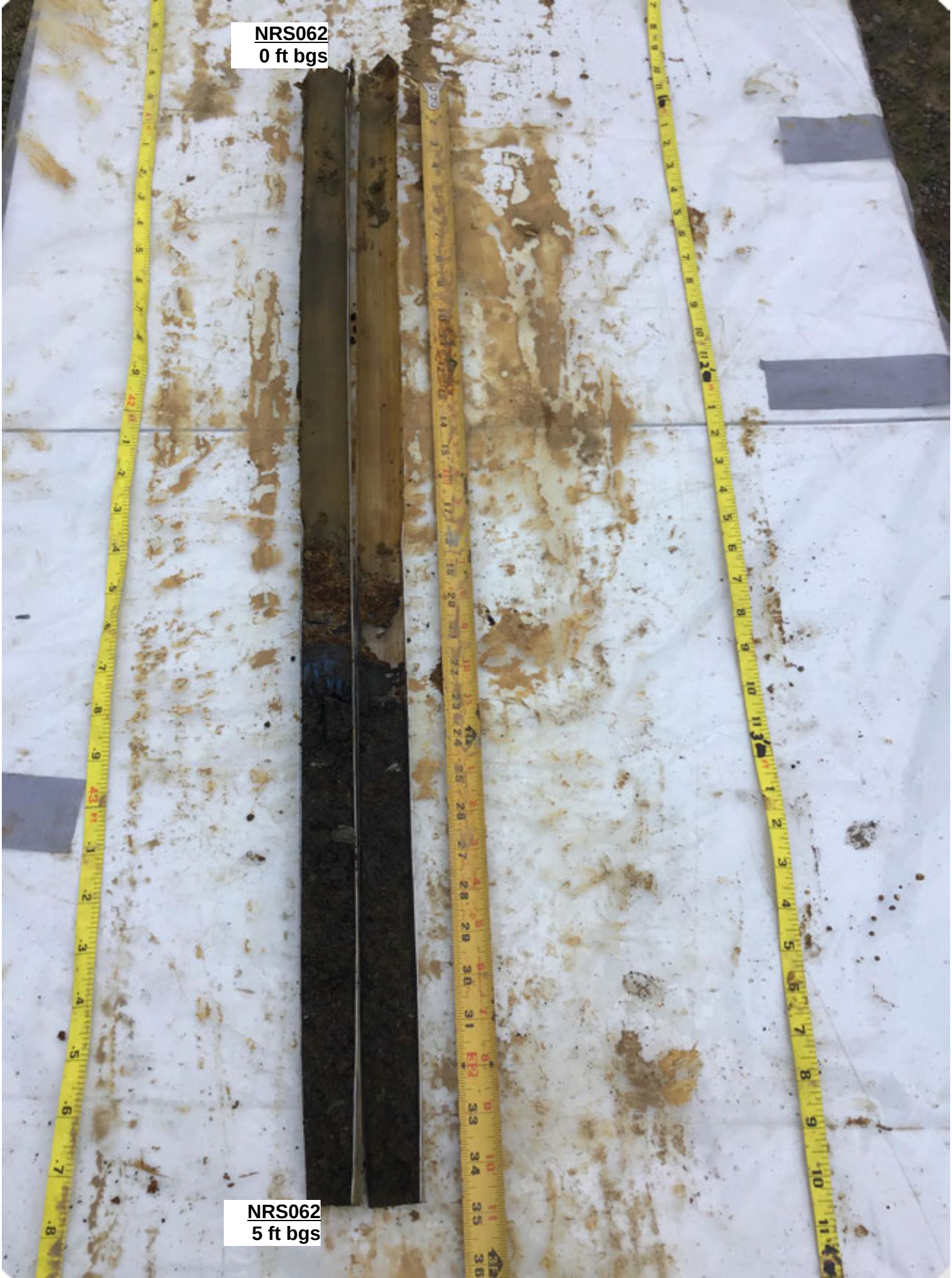

NRS061
25 ft bgs
NRS061
30 ft bgs


NRS061
30 ft bgs
NRS061
35 ft bgs

NRS061
35 ft bgs
NRS061
40 ft bgs


NRS061
40 ft bgs
NRS061
42.5 ft bgs

Boring NRS062

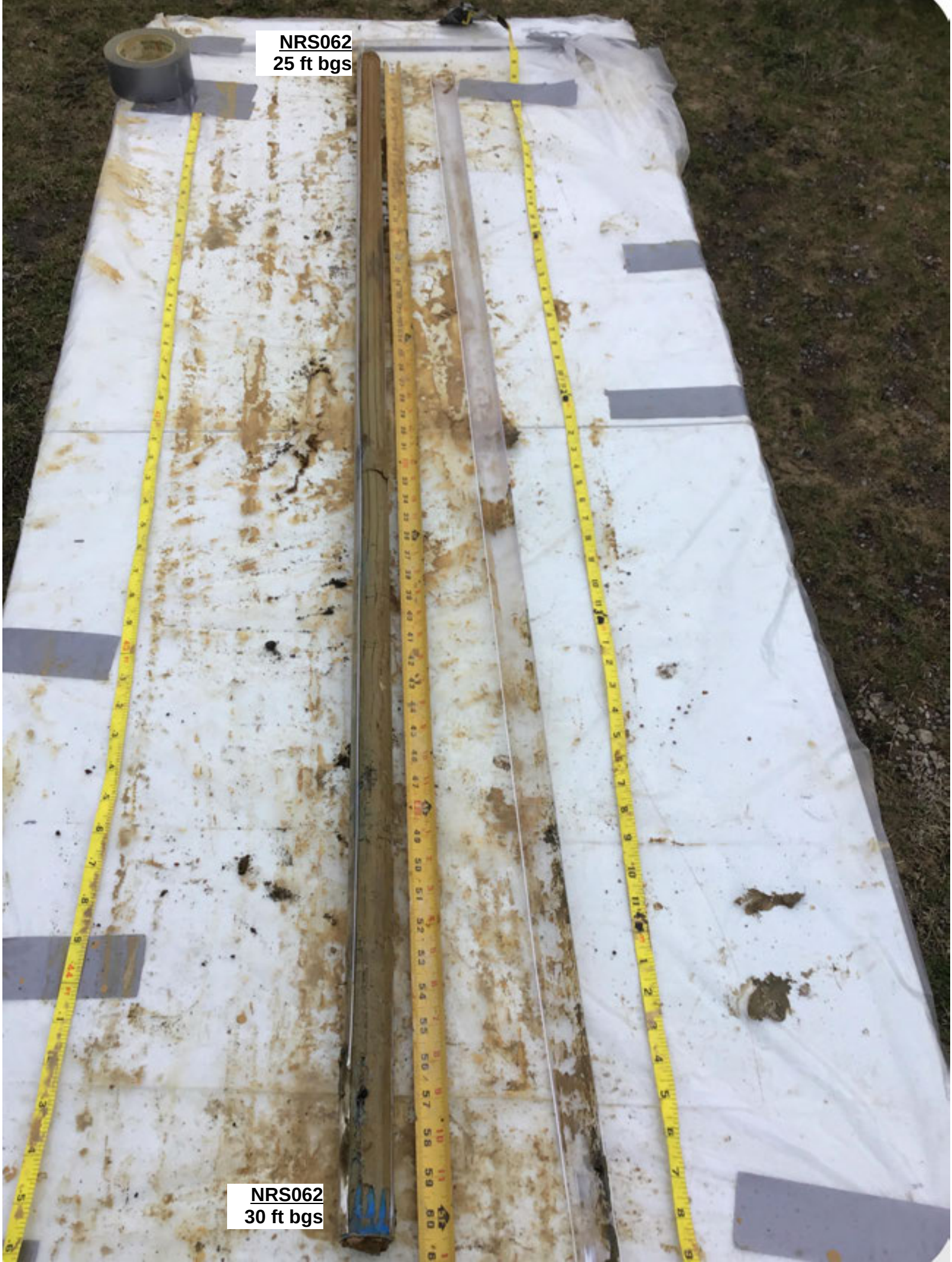

NRS062
0 ft bgs
NRS062
5 ft bgs

NRS062
5 ft bgs
NRS062
10 ft bgs

NRS062
10 ft bgs
NRS062
15 ft bgs

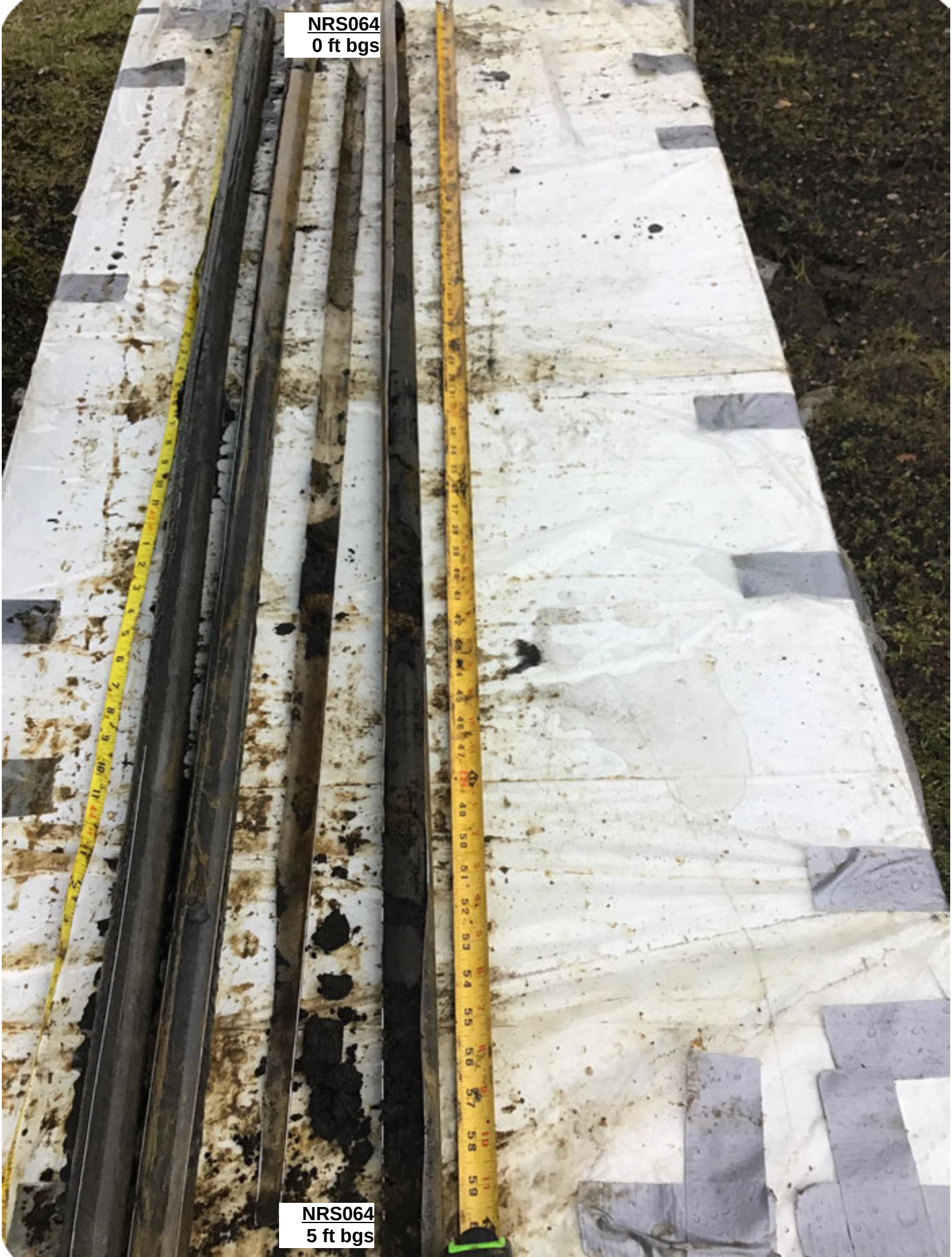
NRS062
15 ft bgs
NRS062
20 ft bgs

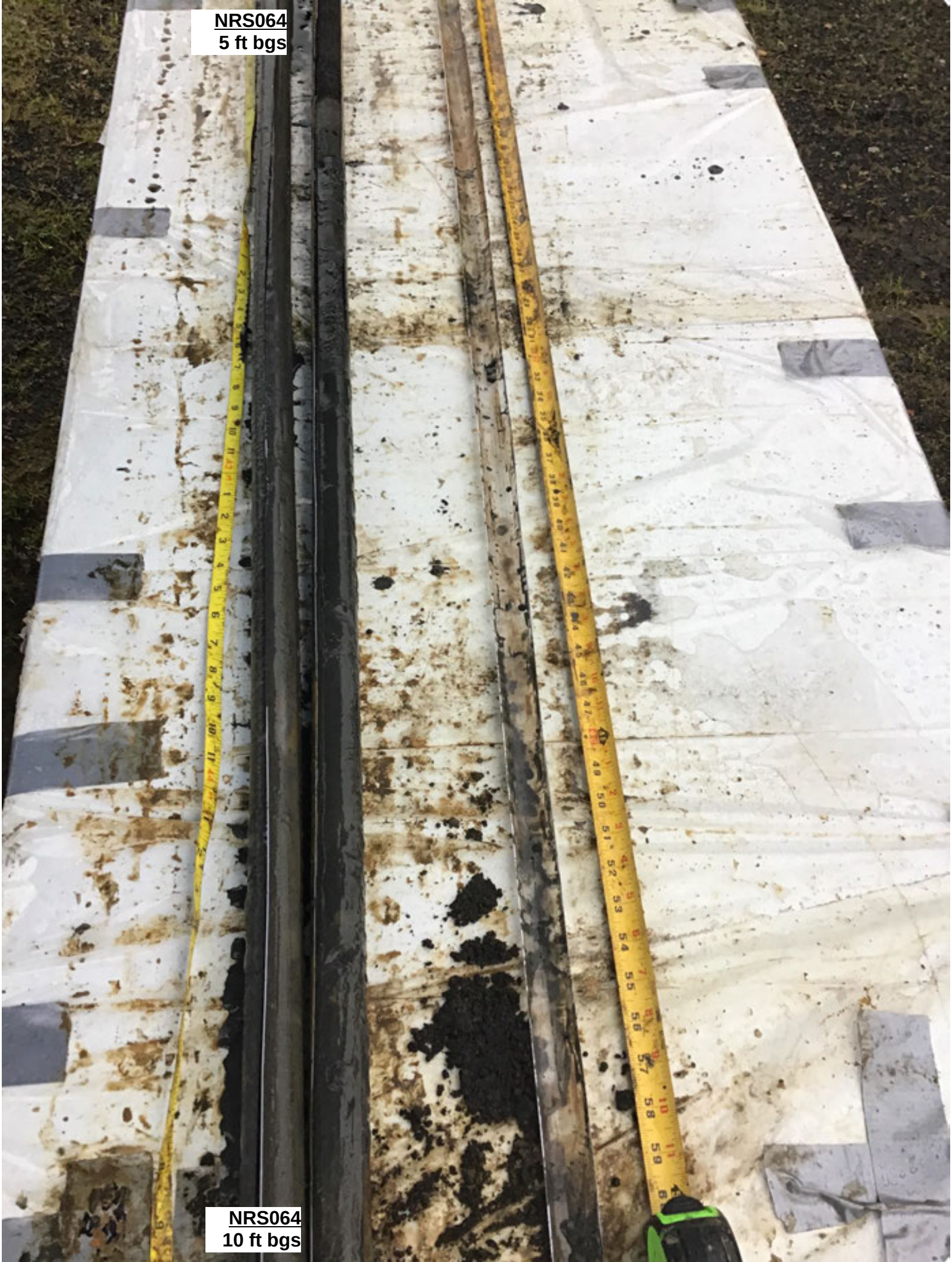
NRS062
20 ft bgs
NRS062
25 ft bgs


NRS062
25 ft bgs
NRS062
30 ft bgs

NRS062
30 ft bgs
NRS062
33 ft bgs
End boring

Boring NRS064


NRS064
0 ft bgs
NRS064
5 ft bgs


NRS064
5 ft bgs
NRS064
10 ft bgs

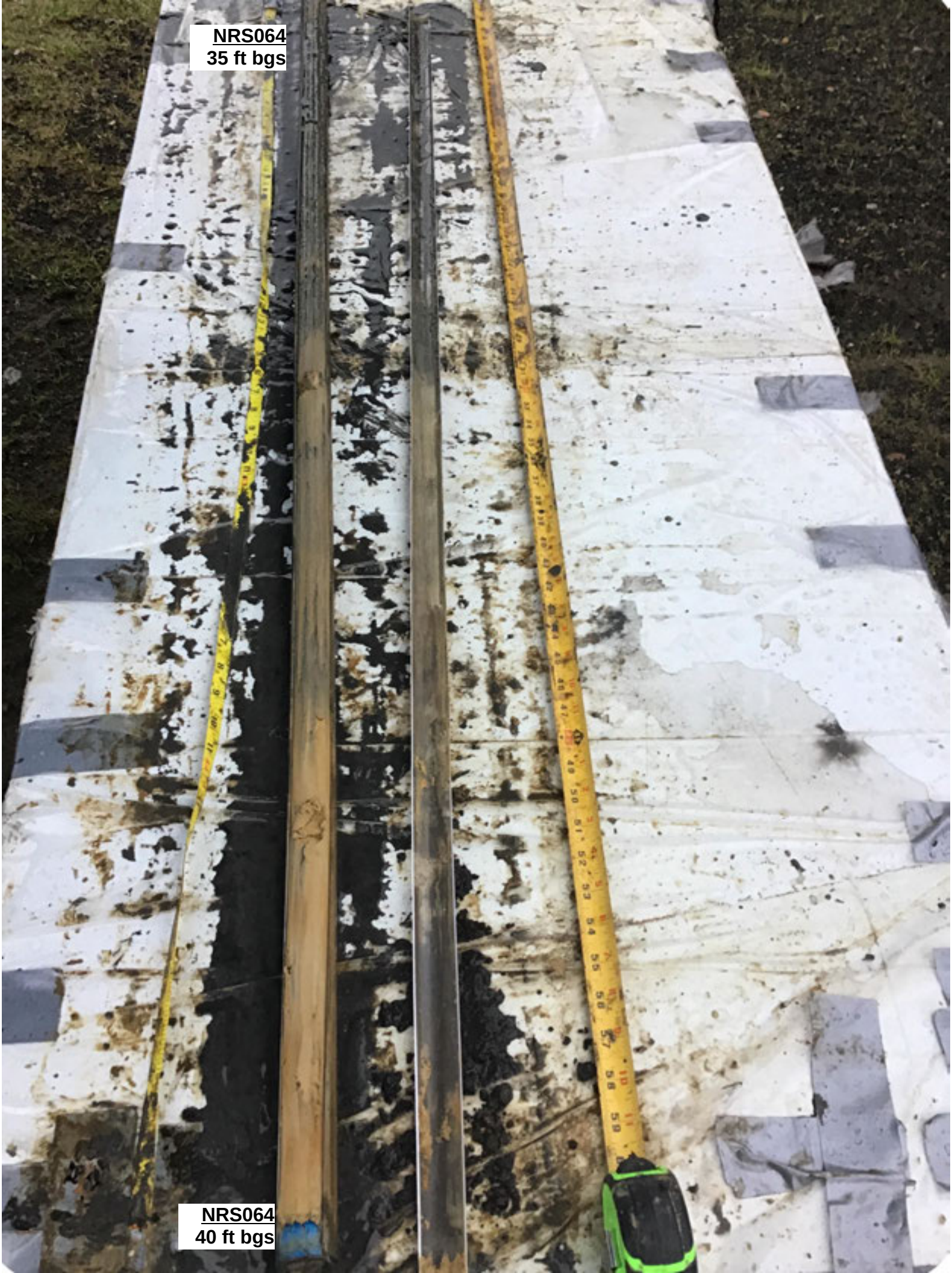
NRS064
10 ft bgs
NRS064
15 ft bgs

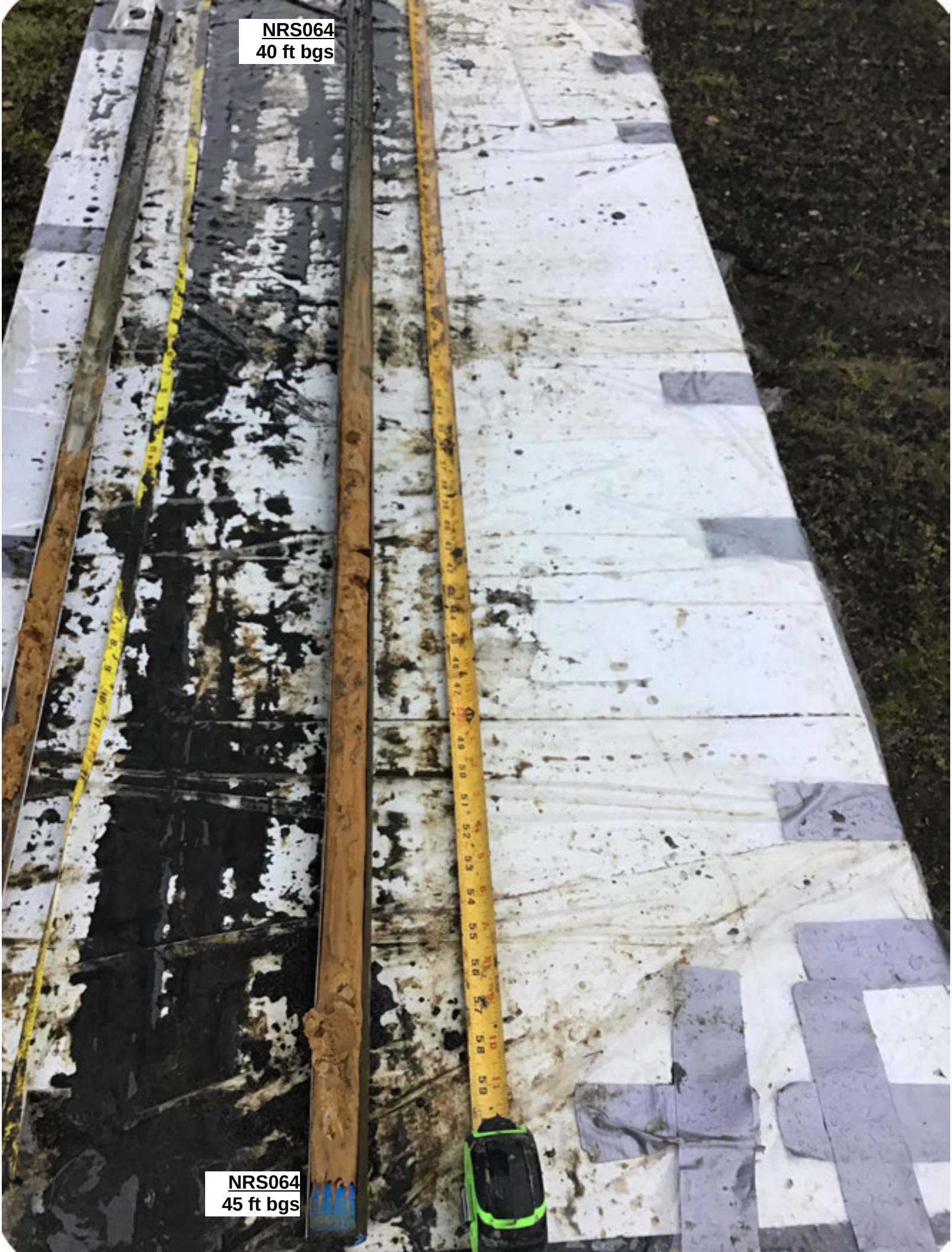
NRS064
15 ft bgs
NRS064
20 ft bgs

NRS064
20 ft bgs
NRS064
25 ft bgs

NRS064
25 ft bgs
NRS064
30 ft bgs

NRS064
30 ft bgs
NRS064
35 ft bgs


NRS064
35 ft bgs
NRS064
40 ft bgs


NRS064
40 ft bgs
NRS064
45 ft bgs

NRS064
45 ft bgs
NRS064
48 ft bgs
End boring

Boring NRS065

NRS065
0-5 ft bgs

NRS065
5 ft bgs
NRS065
10 ft bgs

NRS065
10 ft bgs
NRS065
15 ft bgs

NRS065
15 ft bgs
NRS065
20 ft bgs

NRS065
20 ft bgs
NRS065
25 ft bgs

NRS065
25 ft bgs
NRS065
30 ft bgs

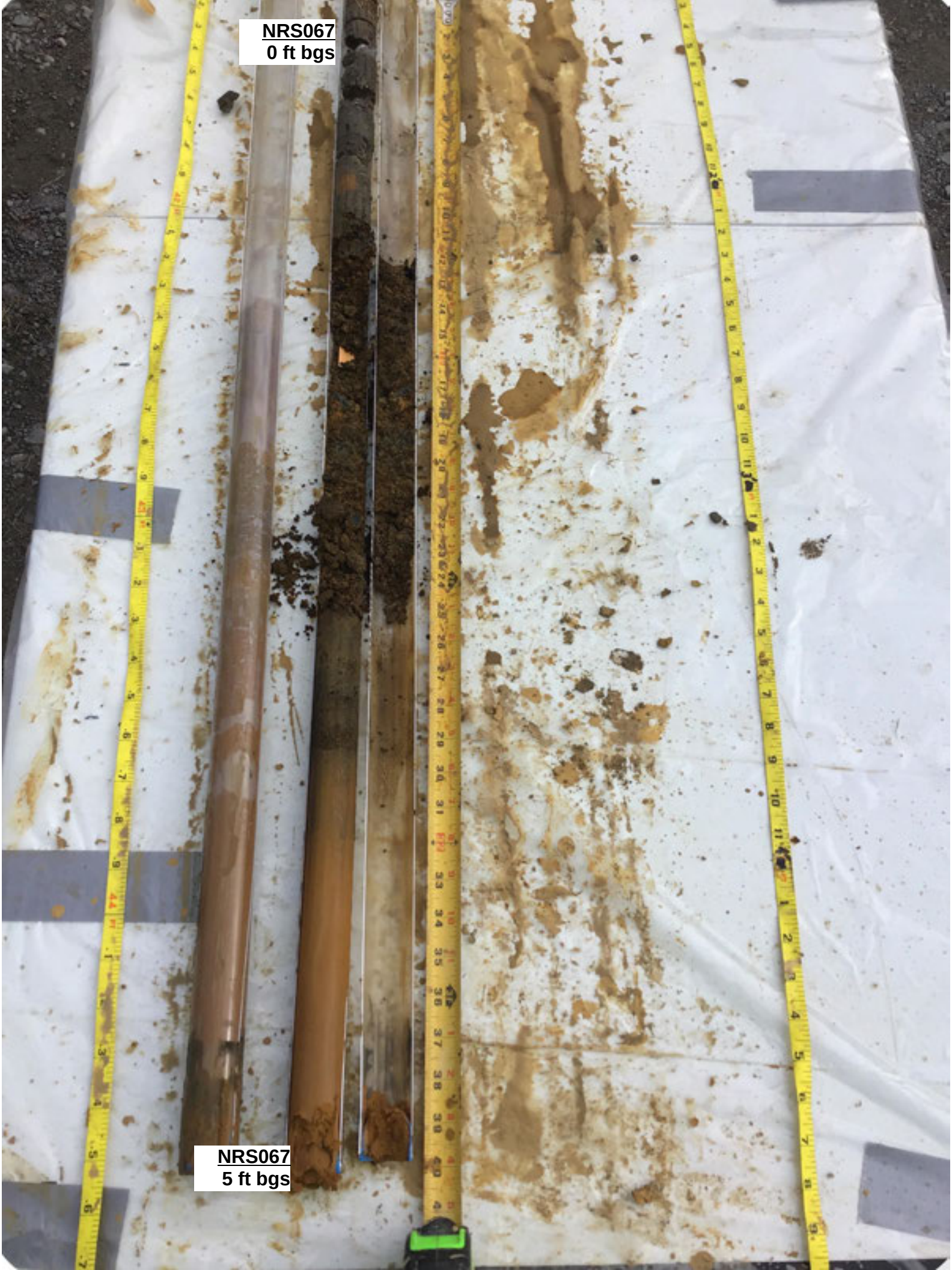
NRS065
30 ft bgs
NRS065
35 ft bgs

NRS065
35 ft bgs
NRS065
40 ft bgs

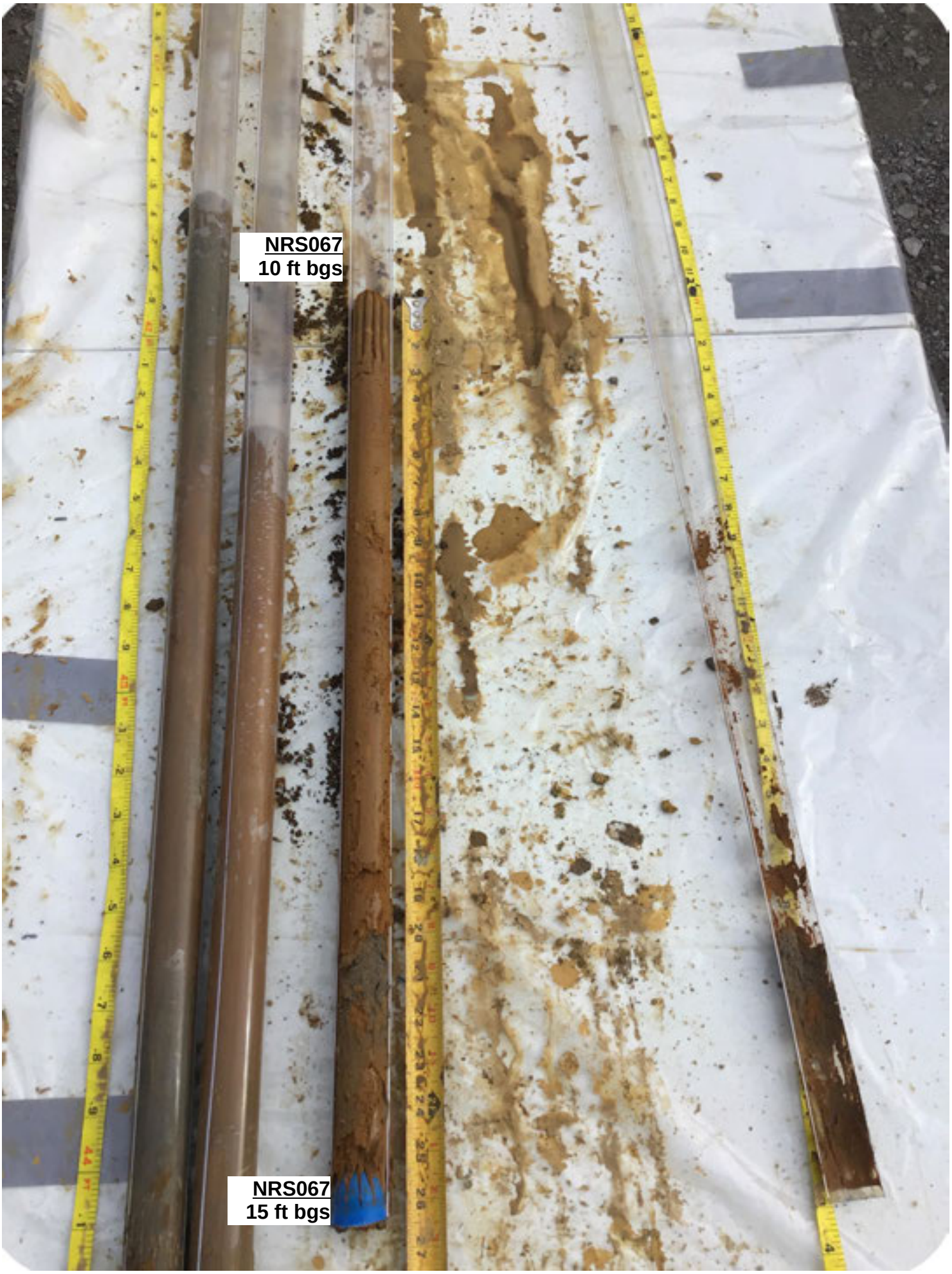
NRS065
40 ft bgs
NRS065
45 ft bgs

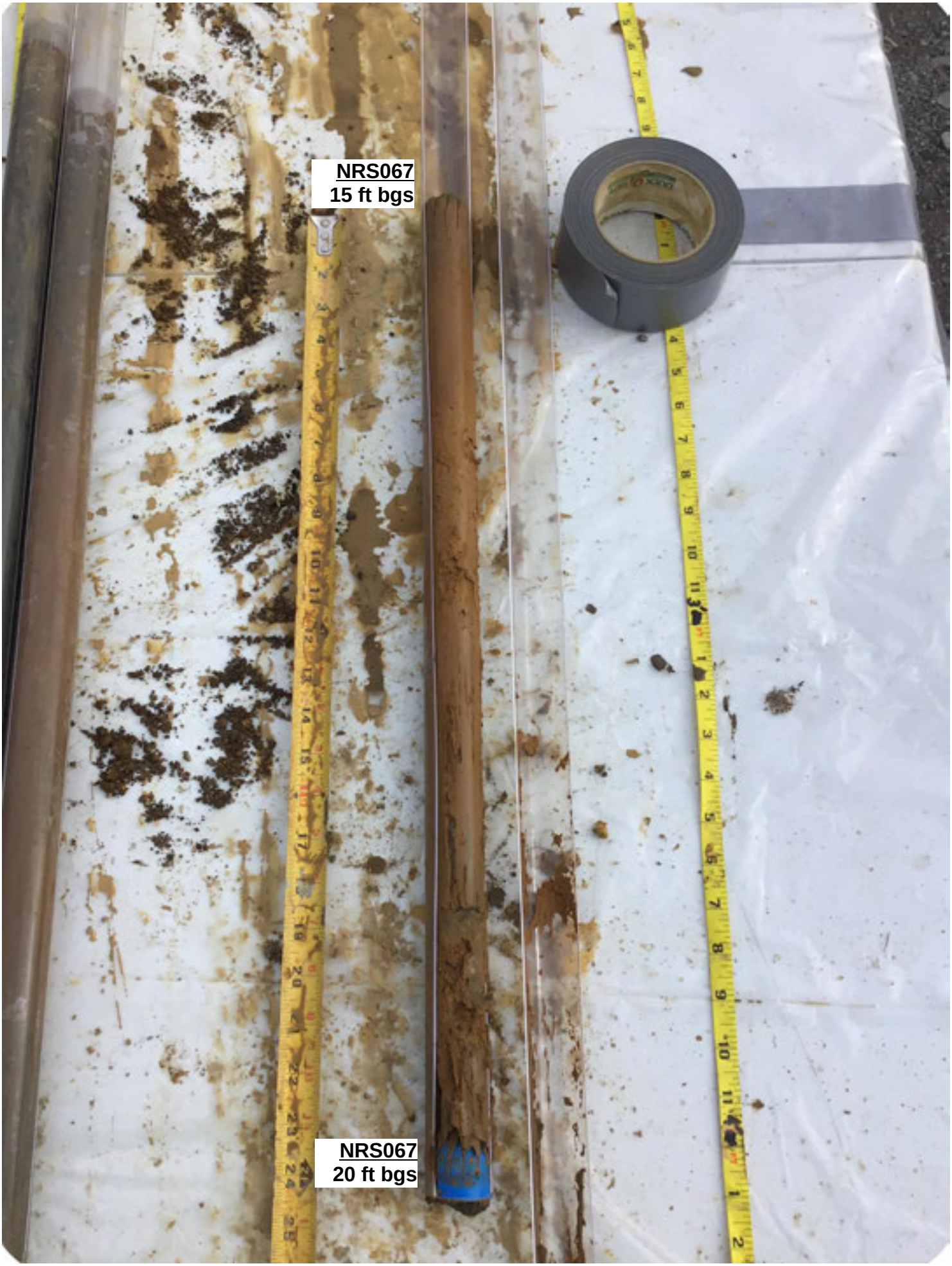
NRS065
45 ft bgs
NRS065
47.5 ft bgs
End boring

Boring NRS067


NRS067
0 ft bgs
NRS067
5 ft bgs

NRS067
5 ft bgs
NRS067
10 ft bgs


NRS067
10 ft bgs
NRS067
15 ft bgs


NRS067
15 ft bgs
NRS067
20 ft bgs

NRS067
20 ft bgs
NRS067
25 ft bgs

NRS067
25 ft bgs
NRS067
30 ft bgs

NRS067
30 ft bgs
NRS067
35 ft bgs
Boring end 35.5'

Boring NRS068 (Well GAF-526U)

NRS068
0 ft bgs
NRS068
10 ft bgs

NRS068
10 ft bgs
Top
NRS068
20 ft bgs

NRS068
20 ft bgs
NRS068
30 ft bgs
Bottom

NRS068
30 ft bgs
NRS068
40 ft bgs

NRS068
40 ft bgs
NRS068
50 ft bgs
SemperGuard
by Sempermed
size XL
Powder-Free

NRS068
50 ft bgs
NRS068
60 ft bgs
Nitrile
Powder-free

NRS068
60 ft bgs
NRS068
70 ft bgs
Botto

NRS068
70 ft bgs
NRS068
80 ft bgs
Port

NRS068
80 ft bgs
NRS068
90 ft bgs

NRS068
90 ft bgs
NRS068
95 ft bgs

Boring NRS069 (Well GAF-541U)

Top
NRS069
0 ft bgs
NRS069
10 ft bgs

TOP
NRS069
10 ft bgs
NRS069
20 ft bgs
DOWN

NRS069
20 ft bgs
NRS069
30 ft bgs
DOWN

NRS069
30 ft bgs
NRS069
40 ft bgs

top
NRS069
40 ft bgs
DOWN
NRS069
50 ft bgs

NRS069
50 ft bgs
NRS069
60 ft bgs
Cascade's CORE™ Driving Safety
CASCADE
SEMPERFORCE
SemperGuard Nitrile
Powder-Free

NRS069
60 ft bgs
Cascade's CORE™ Driving Safety
CASCADE
NRS069
66.4 ft bgs

NRS069
66.4 ft bgs
NRS069
70.1 ft bgs
End boring

Boring NRS070

NRS070
0 ft bgs
NRS070
10 ft bgs
Bolt

NRS070
10 ft bgs
NRS070
20 ft bgs

NRS070
20 ft bgs
NRS070
30 ft bgs

NRS070
30 ft bgs
NRS070
40 ft bgs

NRS070
40 ft bgs
TOP
50
NRS070
50 ft bgs

NRS070
50 ft bgs
Top
NRS070
60 ft bgs

Top
NRS070
60 ft bgs
NRS070
70 ft bgs
End boring

Appendix D – Groundwater Sampling Field Sheets

Table of Contents

1. Well Sampling Field Sheets

2. HACH Kit Well Sampling Field Sheets

3. In Situ Grab Groundwater Sampling Field Sheets

Well Sampling Field Sheets

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/15/20 Sheet 1 of 2

Well ID:	19R	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42.5 to 52.5	Initial Depth to Water (ft BTOC):	26.11	Total Depth (ft BTOC):	52.5
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JLM & CHARLIE ROWARDICH							Start Purge Time (CT):	0810

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0815	0.240	26.24	47.5	16.0	2.63	2282	3.86	38.6	420.6	208
0820	0.240	26.27	47.5	16.1	2.95	2236	1.09	10.9	379.2	199
0825	0.240	26.30	47.5	16.1	3.30	2194	0.52	5.2	335.3	194
0830	0.240	26.30	47.5	16.1	3.34	2219	0.50	5.0	311.2	134
0835	0.240	26.30	47.5	16.1	3.39	2244	0.48	4.8	294.9	99.2
0840	0.240	26.30	47.5	16.1	3.47	2272	0.43	4.3	266.4	61.1
0845	0.240	26.30	47.5	16.1	3.49	2284	0.35	3.5	258.8	49.2
0850	0.240	26.36	47.5	16.1	3.49	2290	0.29	2.9	252.6	45.2
0855	0.240	26.39	47.5	16.1	3.50	2295	0.24	2.4	249.3	41.9
0900	0.240	26.40	47.5	16.1	3.51	2304	0.22	2.2	246.0	35.5
0905	0.240	26.40	47.5	16.1	3.52	2309	0.20	2.0	245.1	33.0
0910	0.240	26.41	47.5	16.1	3.52	2309	0.22	2.2	242.3	30.3
0915	0.240	26.37	47.5	16.1	3.52	2311	0.21	2.1	241.3	26.4
0920	0.240	26.37	47.5	16.1	3.52	2310	0.18	1.8	241.0	26.8
0925	0.240	26.36	47.5	16.1	3.52	2310	0.16	1.6	240.4	26.5
0930	0.240	26.38	47.5	16.1	3.53	2314	0.15	1.5	239.1	23.8
0935	0.240	26.39	47.5	16.1	3.53	2316	0.24	2.4	238.5	21.4
0940	0.240	26.39	47.5	16.1	3.54	2317	0.20	2.0	237.5	19.3
0945	0.240	26.39	47.5	16.1	3.54	2323	0.17	1.7	273.0	17.3
0950	0.240	26.39	47.5	16.1	3.54	2327	0.18	1.8	235.7	17.4
0955	0.240	26.39	47.5	16.1	3.54	2326	0.17	1.7	235.6	16.2
1000	0.240	26.39	47.5	16.1	3.54	2326	0.17	1.7	235.6	14.8
1005	0.240	26.40	47.5	16.1	3.54	2326	0.16	1.6	235.5	15.2
1010	0.240	26.40	47.5	16.1	3.54	2326	0.15	1.5	235.5	17.5
Sample Readings										
1015	0.240	26.40	47.5	16.1	3.54	2326	0.15	1.5	235.4	17.1
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~8.0	Ambient Air Temperature (°F):	65°F		
Sample Time (CT):	1015	Pump Duration (mins) - i.e., total time pump ran during sample collection	160	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	26.40	Final Turbidity: 16.8	Filter Type and Size: 0.45	Pump Used:	MP-15: 26793 PUMP: DEDICATED

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 1/15/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/15/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/15/20 Sheet 2 of 2

Well ID: 19R

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID: 104 PSI: 40

Stability reached? ☒ Yes ☐ No

If no, provide explanation: N/A 1/15 JLM

Sample ID GAF-GW-19R-01152020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1947

MS/MSD collected? ☒ Yes ☐ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1020

Time (CT) last sample bottle placed on ice: 1300

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other 353.2, 9056A_GRGFM_28D_2320B_SM2340, 351.2, 365.4 1/15/20 JLM

General Comments/Observations: COLLECTED GAF-AQ-900A-01152020 & GAF-AQ-90M-01152020 1/15/20 JLM
DI WATER PROVIDED BY TEST AMERICA ON 11/7/19, NO LOT# PROVIDED 1/15/20 JLM
1/15/20 JLM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/15/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/15/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/16/20 Sheet 1 of 2

Well ID:	20	Well Diameter (in):	2	Screen Inteval (ft BTOC):	45 to 55	Initial Depth to Water (ft BTOC):	23.78	Total Depth (ft BTOC):	55
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JLM & CHARLIE ROWARDICH							Start Purge Time (CT):	0757

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0800	0.120	23.80	50	13.9	6.69	1140	4.44	44.4	144.5	14.5
0805	0.120	23.80	50	15.2	6.05	1185	1.60	16.0	64.2	6.72
0810	0.120	23.80	50	15.1	6.14	1185	0.68	6.8	44.6	4.91
0815	0.120	23.80	50	15.1	6.20	1185	0.50	5.0	31.2	4.69
0820	0.120	23.80	50	15.2	6.19	1193	0.48	4.8	29.1	4.04
0825	0.120	23.80	50	15.2	6.19	1204	0.46	4.6	27.8	3.69
0830	0.120	23.80	50	15.3	6.19	1208	0.45	4.5	22.8	3.32

1/16/19 JLM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0830	0.120	23.80	50	15.3	6.19	1208	0.45	4.5	22.8	3.32

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0	Ambient Air Temperature (°F):	46°		
Sample Time (CT):	0830	Pump Duration (mins) - i.e., total time pump ran during sample collection	105	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	23.80	Final Turbidity: 4.35	Filter Type and Size: 0.45	Pump Used:	MP-50: Z6793 PUMP: DEDICATED

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 1/16/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/16/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/16/20 Sheet 2 of 2

Well ID: 20

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI:40

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/16/20 JCM

Sample ID GAF-GW-20-01162020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0835

Time (CT) last sample bottle placed on ice: 1020

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other 353.2, 9056A_GRGFM_28D_2320B_SM2340,351.2,365.4 1/16/20 JCM

General Comments/Observations: 1/16/20 JCM

1/16/20 JCM

1/16/20 JCM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/16/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/16/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/16/20 Sheet 1 of 2

Well ID:	22	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42 to 52	Initial Depth to Water (ft BTOC):	25.75	Total Depth (ft BTOC):	52
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSKAL, JSM & CHARLIE ROWARDICH							Start Purge Time (CT):	1034

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1035	0.200	25.90	47	17.3	7.45	302.0	4.38	43.8	44.3	4.01
1040	0.200	26.71	47	17.7	7.48	313.1	2.04	20.4	52.9	4.21
1045	0.200	27.54	47	17.7	7.47	317.2	1.45	14.5	57.0	4.34
1050	0.200	28.31	47	17.8	7.46	316.4	1.37	13.7	60.1	4.23
1055	0.200	29.20	47	17.8	7.44	313.8	1.36	13.6	64.6	4.96
1100	0.200	30.06	47	17.9	7.41	313.1	1.41	14.1	72.9	4.81
1105	0.200	30.72	47	17.9	7.38	312.4	1.43	14.3	81.5	4.96

1/16/20 JSM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1105	0.200	30.72	47	17.9	7.38	312.4	1.43	14.3	81.5	4.96

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.5			Ambient Air Temperature (°F):	46°		
Sample Time (CT):	1105	Pump Duration (mins) - i.e., total time pump ran during sample collection	80			Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	32.46	Final Turbidity:	3.35	Filter Type and Size:	0.45	Pump Used:	MP-50: Z6793 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 1/16/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/16/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/16/20 Sheet 2 of 2

Well ID: 22

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI:40

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/16/19 SLM

Sample ID GAF-GW-22-01162020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1110

Time (CT) last sample bottle placed on ice: 1230

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other 353.2, 9056A_GR GFM_28D_2320B_SM2340, 351.2, 365.4 1/16/20 SLM

General Comments/Observations: COLLECTED GAF-AQ-900A-01162020 & GAF-AQ-901A-01162020 1/16/20 SLM
DI WATER PROVIDED BY TEST AMERICA ON 11/7/19, NO LOT# PROVIDED 1/16/20 SLM
1/16/20 SLM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/16/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/16/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/14/20 Sheet 1 of 2

Well ID:	~~MW~~26	Well Diameter (in):	2	Screen Inteval (ft BTOC):	96 to 106	Initial Depth to Water (ft BTOC):	17.80	Total Depth (ft BTOC):	106
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSKAL, JSM & CHARLIE ROWARD, CH							Start Purge Time (CT):	0813

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0815	0.140	18.11	101	15.6	7.29	1075	0.50	5.1	-121.7	45.3
0820	0.140	18.15	101	15.8	6.98	894	0.35	3.5	-23.7	82.8
0825	0.140	18.16	101	15.8	6.98	867	0.29	2.9	-51.2	52.9
0830	0.140	18.17	101	15.8	6.98	854	0.23	2.3	-80.6	45.3
0835	0.140	18.18	101	15.8	6.98	865	0.21	2.1	-90.3	45.4
0840	0.140	18.18	101	15.9	6.99	874	0.19	1.9	-107.2	45.8
0845	0.140	18.17	101	15.9	7.16	893	0.18	1.8	-111.9	48.2
0850	0.140	18.17	101	15.9	7.22	919	0.17	1.7	-123.5	51.1
0855	0.140	18.16	101	15.9	7.21	931	0.16	1.6	-125.2	53.7
0900	0.140	18.15	101	15.9	7.21	944	0.16	1.6	-128.9	55.9

1/14/20 JSM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0900	0.140	18.15	101	15.9	7.21	944	0.16	1.6	-128.9	55.9

Additional Purge/Sample Data

Total Volume Purged (gal):	~2.0			Ambient Air Temperature (°F):	56 °F		
Sample Time (CT):	0900	Pump Duration (mins) - i.e., total time pump ran during sample collection	135			Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	18.02	Final Turbidity:	52.8	Filter Type and Size:	0.45	Pump Used:	MP-15: Z6793 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Date: 1/14/20
Reviewed by: SARA MEISSNER Signature: Date: 1/14/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/14/20 Sheet 2 of 2

Well ID: NBS26

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI:50

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/14/20 SLM

1/14/20 SLM

Sample ID GAF-GW-NBS26-01142020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1947

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☒ Yes ☐ No Field Duplicate ID: GAF-GW-903A-01142020

Field Duplicate Sample Time (CT): 0906

Time (CT) first sample bottle placed on ice: 0905

Time (CT) last sample bottle placed on ice: 1120

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☐ Other 1/14/20 SLM

General Comments/Observations: COLLECTED GAF-AQ-900A-01142020 & GAF-AQ-901A-01142020
DI WATER PROVIDED BY TEST AMERICA ON 11/7/19, NO LOT# PROVIDED 1/14/20 SLM

1/14/20 SLM

Sampler Name: JONATHAN MOSHER Signature: Jathan Mosher Date: 1/14/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/14/20

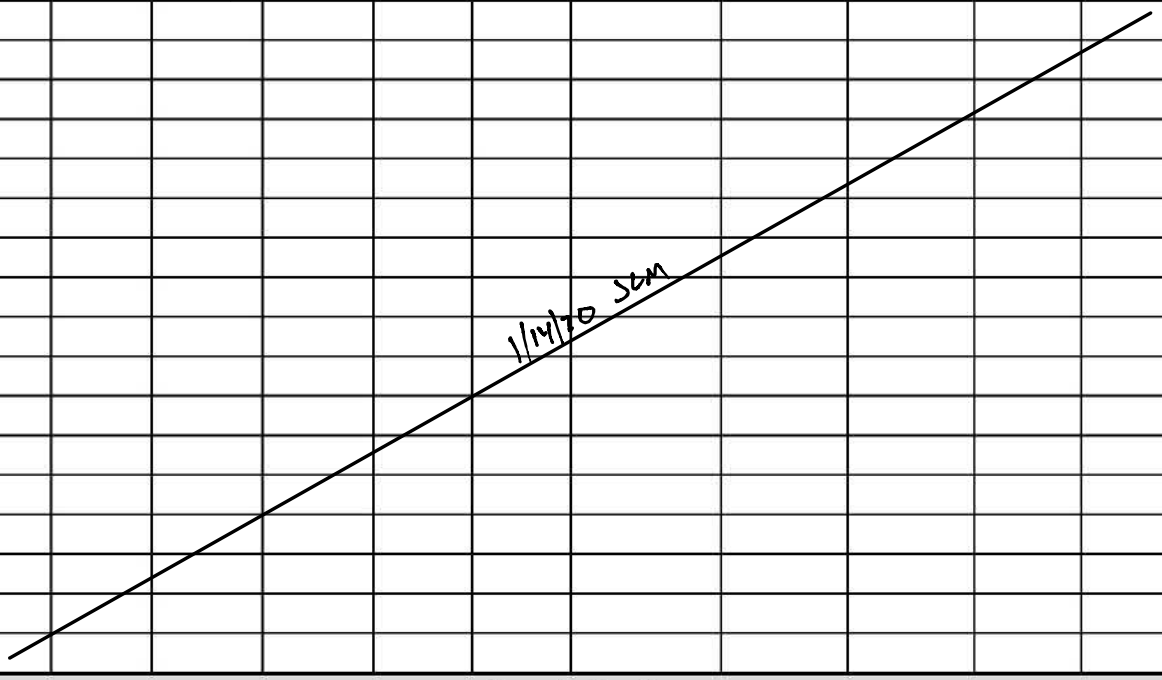
Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/14/20 Sheet 1 of 2

Well ID:	~~ARS~~ 27	Well Diameter (in):	2	Screen Inteval (ft BTOC):	80 to 90	Initial Depth to Water (ft BTOC):	19.91	Total Depth (ft BTOC):	90
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JSM & CHARLIE ROWARD, CH							Start Purge Time (CT):	1128

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1130	0.100	19.94	85	16.7	7.44	1264	0.85	8.5	-100.5	4.82
1135	0.100	20.39	85	16.8	6.93	1324	0.54	5.4	-74.3	4.31
1140	0.100	20.94	85	16.9	6.81	1368	0.50	5.0	-52.8	3.77
1145	0.100	21.42	85	16.8	6.80	1375	0.47	4.7	-50.1	3.84
1150	0.100	22.04	85	16.9	6.80	1373	0.45	4.5	-46.2	3.72
1155	0.100	22.68	85	16.9	6.81	1372	0.43	4.3	-41.8	3.68
1200	0.100	23.21	85	17.0	6.81	1374	0.39	3.9	-40.2	3.79



Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1200	0.100	23.21	85	17.0	6.81	1374	0.39	3.9	-40.2	3.79

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0	Ambient Air Temperature (°F):	60°F		
Sample Time (CT):	1200	Pump Duration (mins) - i.e., total time pump ran during sample collection	65	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	30.81	Final Turbidity: 2.79	Filter Type and Size: N/A	Pump Used:	MP-15: 26793 PUMP: DEDICATED

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 1/14/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/14/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/14/20 Sheet 2 of 2

Well ID: MW527

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:W3 PSI:45

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/14/20 SCM

1/14/20 SCM

Sample ID GAF-GW-MW527-01142020

☒ Unfiltered ☐ Filtered ☐ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1205

Time (CT) last sample bottle placed on ice: 1310

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☐ Other 1/14/20 SCM

1/14/20 SCM

General Comments/Observations: 1/14/20 SCM

1/14/20 SCM

1/14/20 SCM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/14/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/14/20

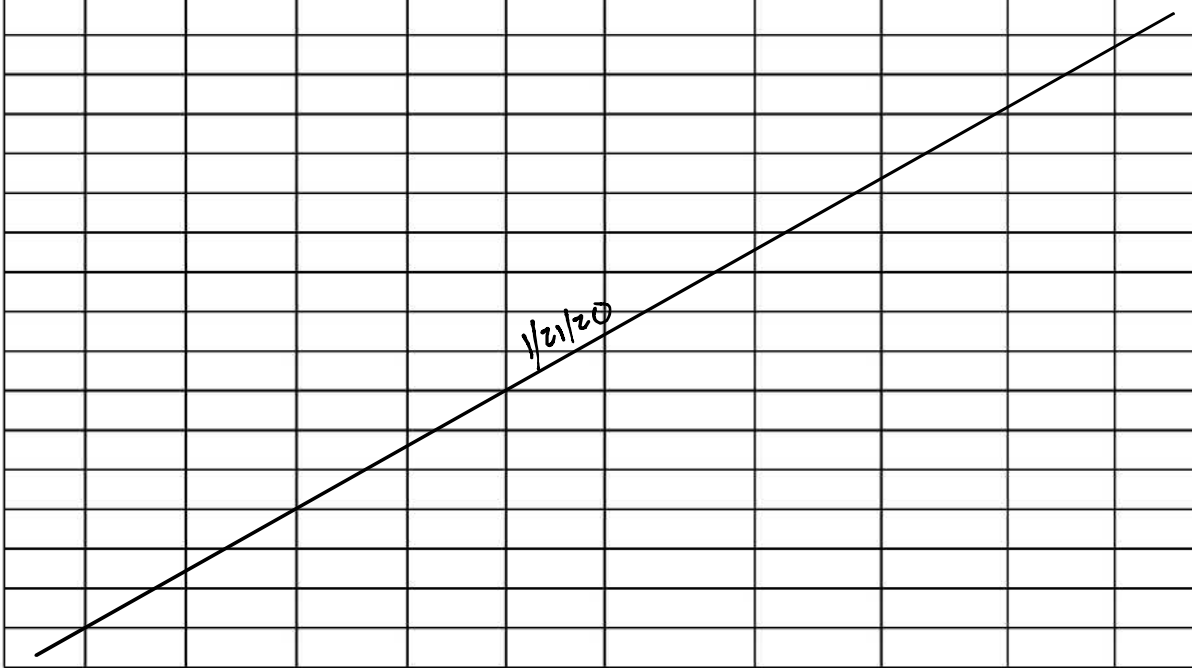
Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/21/20 Sheet 1 of 2

Well ID:	GAF-439U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	32.5 to 37.5	Initial Depth to Water (ft BTOC):	3.52	Total Depth (ft BTOC):	37.5
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JLM & CHARLIE ROWARDICH							Start Purge Time (CT):	0758

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0800	0.200	3.55	35	11.5	6.82	1148	2.13	21.3	-55.9	34.3
0825	0.120	3.48	35	10.7	6.78	1140	0.98	9.8	-63.8	39.3
0810	0.120	3.82	35	12.0	6.86	1052	0.60	6.0	-68.0	44.7
0815	0.120	3.87	35	12.2	6.83	1129	0.53	5.3	-73.9	48.2
0820	0.120	3.90	35	12.3	6.82	1185	0.49	4.9	-77.0	51.9
0825	0.120	3.91	35	12.4	6.87	1197	0.46	4.6	-81.2	53.6
0830	0.120	3.92	35	12.5	6.89	1209	0.44	4.4	-84.9	54.2



Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0830	0.120	3.92	35	12.5	6.89	1209	0.44	4.4	-84.9	54.2

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0			Ambient Air Temperature (°F):	25°		
Sample Time (CT):	0830	Pump Duration (mins) - i.e., total time pump ran during sample collection		75	Color/ Odor	TRANSLUCENT	
Final DTW (ft BTOC):	4.21	Final Turbidity:	69.4	Filter Type and Size:	0.45	Pump Used:	MP-50: 26793 PUMP: DEDICATED

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 1/21/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/21/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/21/20 Sheet 2 of 2

Well ID: GAF-439V

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI: 22

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/21/20

Sample ID GAF-GW-439V-01212020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0835

Time (CT) last sample bottle placed on ice: 0950

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# UNKNOWN

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other 353.2, 9056A_GRGFM_28D_23203_SM2310, 351.2, 365.4

General Comments/Observations: COLLECTED GAF-AQ-900A-01202020 & GAF-AQ-901A-01202020
DI WATER PROVIDED BY TEST AMERICA ON 11/7/19, NO LOT# PROVIDED

1/21/20 JCM
1/21/20 JCM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/21/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/21/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/17/20 Sheet 1 of 2

Well ID:	GAF-440V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	44 to 54	Initial Depth to Water (ft BTOC):	12.55	Total Depth (ft BTOC):	54
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSKAL, JSM & CHARLIE ROWARDICH							Start Purge Time (CT):	0807

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0810	0.100	12.63	49	14.7	6.67	1219	2.94	29.4	40.0	196
0815	0.100	12.72	49	12.2	6.69	1147	2.25	22.5	55.2	773
0820	0.100	12.75	49	12.3	6.70	1150	1.81	18.1	68.1	422
0825	0.100	12.77	49	12.3	6.70	1154	1.33	13.3	87.0	304
0830	0.100	12.78	49	12.2	6.70	1155	1.21	12.1	102.4	254
0835	0.100	12.79	49	12.2	6.70	1155	1.24	12.4	117.3	269
0840	0.100	12.80	49	12.3	6.70	1156	1.19	11.9	130.2	251
0845	0.100	12.81	49	12.2	6.70	1156	1.27	12.7	141.9	240

1/17/20 JSM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0845	0.100	12.81	49	12.2	6.70	1156	1.27	12.7	141.9	240

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0	Ambient Air Temperature (°F):	34°		
Sample Time (CT):	0845	Pump Duration (mins) - i.e., total time pump ran during sample collection	110	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	13.12	Final Turbidity: 123	Filter Type and Size: 0.45	Pump Used:	MP-50: Z6793 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 1/17/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/17/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/17/20 Sheet 2 of 2

Well ID: GAF-440V

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID: 103 PSI: 30

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/17/20 JCM

Sample ID GAF-GW-440V-01172020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0850

Time (CT) last sample bottle placed on ice: 1040

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# UNKNOWN

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other 353.2, 9056A_GRGFM_28D_232U3_SM2340, 391.2, 365.4 1/17/20 JCM

General Comments/Observations: 1/17/20 JCM

1/17/20 JCM

1/17/20 JCM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/17/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/17/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/16/20 Sheet 1 of 2

Well ID:	441U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	43 to 53	Initial Depth to Water (ft BTOC):	13.61	Total Depth (ft BTOC):	53
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JSM & CHARLIE ROWARDICH							Start Purge Time (CT):	1303

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1305	0.120	13.92	47	18.2	2.55	5771	1.93	19.3	389.2	98.4
1310	0.100	14.51	47	18.3	2.60	5750	1.01	10.1	361.3	92.4
1315	0.100	15.1	47	18.5	2.99	5726	0.81	8.1	329.3	137
1320	0.100	15.34	47	18.5	3.41	5590	0.55	5.5	291.3	132
1325	0.100	15.67	47	18.5	3.49	5561	0.49	4.9	260.7	143
1330	0.100	16.02	47	18.5	3.50	5538	0.46	4.6	238.6	145
1335	0.100	16.33	47	18.5	3.50	5546	0.44	4.4	230.1	149

1/16/20 JSM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1335	0.100	16.33	47	18.5	3.50	5546	0.44	4.4	230.1	149

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0	Ambient Air Temperature (°F):	48°		
Sample Time (CT):	1335	Pump Duration (mins) - i.e., total time pump ran during sample collection	100	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	19.02	Final Turbidity: 136	Filter Type and Size: 0.45	Pump Used:	MP-30 : Z6793 PUMP : DEDICATED

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 1/16/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/16/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/16/20 Sheet 2 of 2

Well ID: GAF-441U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI:25

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/16/20 SLM

Sample ID GAF-GW-GAF441U-01162020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1340

Time (CT) last sample bottle placed on ice: 1520

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# UNKNOWN

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☐ Other 353.2, 9056A_GRGFM_28D_2320B_SM2340, 391.2, 365.4 1/16/20 SLM

General Comments/Observations: 1/16/20 SLM

1/16/20 SLM

1/16/20 SLM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/16/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/16/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/17/20 Sheet 1 of 2

Well ID:	442U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	62 to 72	Initial Depth to Water (ft BTOC):	43.37	Total Depth (ft BTOC):	72
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JCM & CHARLIE ROWARD, CH							Start Purge Time (CT):	1123

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1125	0.100	43.53	67	11.6	7.07	1343	3.70	37.0	-24.6	143
1130	0.100	43.97	67	13.2	6.82	1519	0.92	9.2	-11.3	141
1135	0.100	44.41	67	14.4	6.67	1720	0.61	6.1	12.7	143
1140	0.100	44.90	67	14.8	6.60	1738	0.50	5.0	7.4	120
1145	0.100	45.41	67	14.7	6.59	1736	0.47	4.7	5.2	112
1150	0.100	45.80	67	14.7	6.58	1735	0.44	4.4	3.1	115
1155	0.100	46.52	67	14.8	6.52	1730	0.47	4.7	-6.2	111

1/17/19 JCM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1155	0.100	46.52	67	14.8	6.52	1730	0.47	4.7	-6.2	111

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0	Ambient Air Temperature (°F):	37°		
Sample Time (CT):	1155	Pump Duration (mins) - i.e., total time pump ran during sample collection	110	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	56.00	Final Turbidity: 37.1	Filter Type and Size: 0.45	Pump Used:	MP-50: Z6793 PUMP: DEDICATED

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 1/17/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/17/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/17/20 Sheet 2 of 2

Well ID: GAF442V

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI:40

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/17/20 SLM

Sample ID GAF-GW-442V-01172020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1200

Time (CT) last sample bottle placed on ice: 1350

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# UNKNOWN

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other 353.2, 9056A_GRGFM_28D_2320B_SM2310,351.2,365.4 1/17/20 SLM

General Comments/Observations: COLLECTED GAF-AQ-900A-01172020 & GAF-AQ-901A-01172020 1/17/20 SLM
DI WATER PROVIDED BY TEST AMERICA ON 11/7/19, NO LOT# PROVIDED 1/17/20 SLM
1/17/20 SLM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/17/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/17/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/20/20 Sheet 1 of 2

Well ID:	GAF-MW4U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	53 to 63	Initial Depth to Water (ft BTOC):	36.51	Total Depth (ft BTOC):	63
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JLM & CHARLIE ROWARD, CH							Start Purge Time (CT):	1319

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1320	0.150	36.57	58	13.3	4.27	1812	1.62	16.2	258.3	17.0
1325	0.100	36.92	58	13.5	4.23	1821	1.30	13.0	260.2	11.2
1330	0.100	37.41	58	13.6	4.20	1830	0.98	9.8	278.4	10.1
1335	0.100	37.82	58	13.7	4.15	1842	0.90	8.0	292.1	9.49
1340	0.100	38.14	58	15.1	4.14	1873	0.52	5.2	292.6	9.41
1345	0.100	38.61	58	15.0	4.14	1904	0.47	4.5	293.1	9.60
1350	0.100	38.97	58	15.1	4.13	1917	0.43	4.3	292.6	9.97

1/20/20 JLM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1350	0.100	38.97	58	15.1	4.13	1917	0.43	4.3	292.6	9.97

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0			Ambient Air Temperature (°F):	25°		
Sample Time (CT):	1350	Pump Duration (mins) - i.e., total time pump ran during sample collection		80	Color/ Odor	TRANSLUCENT	
Final DTW (ft BTOC):	43.21	Final Turbidity:	9.30	Filter Type and Size:	0.45	Pump Used:	MP-50: 26793 PUMP: 903723

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 1/20/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/20/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/20/20 Sheet 2 of 2

Well ID: GAF-440U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI:30

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/20/20 JLM

Sample ID GAF-GW-440U-01202020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1355

Time (CT) last sample bottle placed on ice: 1515

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# UNKNOWN

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other 353.2, 9056A_GRGFM_28D_232013_SM2340, 351.2, 365.4

General Comments/Observations: COLLECTED GAF-AQ-900A-01202020 & GAF-AQ-900A-01202020 DI WATER PROVIDED BY TEST AMERICA ON 11/7/19 NO LOT# PROVIDED. COLLECTED GAF-AQ-904A-01202020

1/20/20 JLM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/20/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/20/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/21/20 Sheet 1 of 2

Well ID:	GAF-447U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	11.6 to 16.6	Initial Depth to Water (ft BTOC):	3.78	Total Depth (ft BTOC):	16.6
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JLM & CHARLIE ROWARD, CH							Start Purge Time (CT):	1219

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1220	0.200	4.71	14	11.3	6.51	1652	1.72	17.2	124.5	342
1225	0.100	5.23	14	11.5	6.52	1663	1.10	11.0	107.2	191
1230	0.100	5.89	14	11.2	6.52	1674	0.90	9.0	94.1	157
1235	0.100	6.33	14	11.7	6.53	1672	0.95	9.5	88.2	134
1240	0.100	6.85	14	11.3	6.54	1669	1.00	10.0	84.9	155
1245	0.100	7.32	14	11.3	6.54	1661	0.97	9.7	76.2	142
1250	0.100	7.81	14	11.4	6.53	1655	0.99	9.9	70.0	137

1/21/20 SLM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1250	0.100	7.81	14	11.4	6.53	1655	0.99	9.9	70.0	137

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0			Ambient Air Temperature (°F):	26°
Sample Time (CT):	1250	Pump Duration (mins) - i.e., total time pump ran during sample collection	100	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	11.00	Final Turbidity: 18.4	Filter Type and Size: 0.45	Pump Used:	MP-50: 26793 PUMP: DEDICATED

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 1/21/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/21/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/21/20 Sheet 2 of 2

Well ID: GAF-447V

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI: 10

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/21/20

Sample ID GAF-GW-447V-01212020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1255

Time (CT) last sample bottle placed on ice: 1435

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# Unknown

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other 353.2, 9056A_GRGFM_28D_23203_SM2310, 351.2, 365.4

General Comments/Observations: 1/21/20 JCM

1/21/20 JCM

1/21/20 JCM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/21/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/21/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/20/20 Sheet 1 of 2

Well ID:	GAF-498V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	38 to 53	Initial Depth to Water (ft BTOC):	12.50	Total Depth (ft BTOC):	53
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JLM & CHARLIE ROWARDICH							Start Purge Time (CT):	1054

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or <5
1055	0.200	12.50	45	10.7	6.56	896	1.08	10.8	-75.6	84.1
1100	0.100	13.51	45	13.7	6.72	962	0.72	7.2	-81.9	53.2
1105	0.100	14.53	45	14.2	6.89	1007	0.57	5.7	-92.2	45.1
1110	0.100	15.55	45	15.1	6.90	1027	0.48	4.8	-110.3	42.3
1115	0.100	16.59	45	15.0	6.90	1043	0.43	4.3	-118.1	49.7
1120	0.100	17.62	45	15.1	6.92	1031	0.38	3.8	-120.4	46.4
1125	0.100	18.71	45	15.1	6.93	1025	0.33	3.3	-123.9	48.5

1/20/20 JLM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1125	0.100	18.71	45	15.1	6.93	1025	0.33	3.3	-123.9	48.5

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0	Ambient Air Temperature (°F):	20°		
Sample Time (CT):	1125	Pump Duration (mins) - i.e., total time pump ran during sample collection	95	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	30.41	Final Turbidity: 70.5	Filter Type and Size: 0.45	Pump Used:	MP-50: Z6793 PUMP: 903773

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 1/20/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/20/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/20/20 Sheet 2 of 2

Well ID: GAF-448U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI: 30

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/20/20

Sample ID GAF-GW-448U-01202020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1130

Time (CT) last sample bottle placed on ice: 1305

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# UNKNOWN

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other 3532, 9056A_GRGFM_28D_23201B_SM2340,359.2,365 1/20/20 JLM

General Comments/Observations: 1/20/20 JLM

1/20/20 JLM

1/20/20 JLM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/20/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/20/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/21/20 Sheet 1 of 2

Well ID:	GAF-489V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	47 to 57	Initial Depth to Water (ft BTOC):	10.21	Total Depth (ft BTOC):	1004
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSKAL, JSM & CHARLIE ROWARD, CH							Start Purge Time (CT):	1002

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1005	0.100	10.35	52	13.2	6.53	62.5	2.05	20.5	72.9	38.6
1010	0.100	11.04	52	13.9	6.35	60.7	1.92	19.2	98.7	141
1015	0.100	12.12	52	13.8	6.33	59.8	1.84	18.4	111.0	31.2
1020	0.100	13.21	52	13.2	6.24	56.0	1.93	19.3	133.4	22.9
1025	0.100	14.32	52	13.1	6.20	53.0	1.88	18.8	151.5	18.6
1030	0.100	15.34	52	13.2	6.14	50.3	1.92	19.2	162.3	17.5
1035	0.100	16.31	52	13.2	6.11	48.7	1.96	19.6	171.5	17.6

1/21/20

Sample Readings

1035	0.100	16.31	52	13.2	6.11	48.7	1.96	19.6	171.5	17.6
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	41.0	Ambient Air Temperature (°F):	26°		
Sample Time (CT):	1035	Pump Duration (mins) - i.e., total time pump ran during sample collection	90	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	26.11	Final Turbidity: 5.26	Filter Type and Size: 0.45	Pump Used:	MP-50: 26793 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 1/21/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/21/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/21/20 Sheet 2 of 2

Well ID: GAF-489V

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI:30

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 1/21/20

Sample ID GAF-GW-489V-01212020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1040

Time (CT) last sample bottle placed on ice: 1207

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# UNKNOWN

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other 353.2, 9056A_GRGFM_28D_232013_SM2310, 351.2, 365.4

General Comments/Observations: 1/21/20 JCM

1/21/20 JCM

1/21/20 JCM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/21/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/21/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 1/20/20 Sheet 1 of 2

Well ID:	S3	Well Diameter (in):	2	Screen Inteval (ft BTOC):	51 to 61	Initial Depth to Water (ft BTOC):	25.87	Total Depth (ft BTOC):	61
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSKAL, JLM & CHARLIE ROWARDICH							Start Purge Time (CT):	0858

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0900	0.100	25.92	56	9.9	3.89	1460	6.81	68.1	257.3	29.9
0905	0.130	25.88	56	9.2	3.86	1451	6.61	66.1	255.2	16.3
0910	0.130	25.88	56	9.1	3.84	1443	6.25	62.5	253.6	12.9
0915	0.130	25.88	56	8.9	3.82	1437	0.50	5.0	252.6	11.4
0920	0.130	25.88	56	9.0	3.87	1446	0.46	4.6	251.9	11.9
0925	0.130	25.88	56	9.0	3.83	1465	0.43	4.3	251.7	11.7
0930	0.130	25.88	56	9.0	3.80	1470	0.39	3.9	251.4	12.2

1/20/20 JLM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0930	0.130	25.88	56	9.0	3.80	1470	0.39	3.9	251.4	12.2

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0			Ambient Air Temperature (°F):	20°		
Sample Time (CT):	0930	Pump Duration (mins) - i.e., total time pump ran during sample collection	65			Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	25.88	Final Turbidity:	7.45	Filter Type and Size:	0.45	Pump Used:	MP-50: 26743 PUMP: 903723

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 1/20/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/20/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 1/20/20 Sheet 2 of 2

Well ID: GAF-S3

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI:40

Stability reached? ☒ Yes ☐ No

If no, provide explanation: N/A 1/20/20 SLM

Sample ID GAF-GW-S3-01202020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A1942

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0935

Time (CT) last sample bottle placed on ice: 1040

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# UNKNOWN

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other 353.2, 9056A_GRGFM_28D_2320B_SM2340, 351.2, 365.4 1/20/20 SLM

General Comments/Observations: 1/20/20 SLM

1/20/20 SLM

1/20/20 SLM

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 1/20/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 1/20/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 02·13·2020 Sheet 1 of 2

Well ID:	GAF444N	Well Diameter (in):	2	Screen Inteval (ft BTOC):	53 to 63	Initial Depth to Water (ft BTOC):	33.83	Total Depth (ft BTOC):	63
Sample Team Members: Name/Affiliation/Initials:	Charlie Howard/AECOM/CCH							Start Purge Time (CT):	0940

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0945	0.100	34.9	57	14.8	3.87	2316	1.24	12.4	283	38.8
0950	"	35.29	"	14.9	3.89	2318	1.10	11.0	275.1	44.9
0955		35.47		15.0	3.91	2321	1.04	10.4	263.4	57.9
1000		36.21		15.0	3.92	2320	1.05	10.6	253.8	52.2
1005		36.66		14.6	3.93	2292	1.00	10.0	249.9	45.4
1010		36.80		14.4	3.93	2282	1.01	9.9	246.2	42.3
1015		37.91		14.3	3.93	2275	0.88	8.8	241.1	38.8
1020		37.60		14.2	3.94	2273	0.77	7.5	240.4	34.2
1025		37.33		14.1	3.94	2269	0.78	7.5	239.9	31.0
1030		38.81		14.0	3.94	2260	0.79	7.6	237.7	28.8
1035		38.10		13.9	3.94	2253	0.77	7.5	236.2	24.9
1040		38.49		14.2	3.94	2261	0.76	7.6	234.1	19.9
1045		38.61		14.4	3.94	2285	0.76	7.5	233.7	16.9
1050		38.88		14.2	3.94	2277	0.75	7.4	231.2	12.9
1055		39.10		14.1	3.95	2267	0.74	7.3	226.7	10.6
1100		39.51		14.2	3.93	2266	0.76	7.4	229.9	9.23
1105		39.70		14.2	3.94	2261	0.74	7.5	230.3	10.6

2/13/20

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	2			Ambient Air Temperature (°F):	40		
Sample Time (CT):	1105	Pump Duration (mins) - i.e., total time pump ran during sample collection	30			Color/ Odor	Clear / NA
Final DTW (ft BTOC):	40.15	Final Turbidity:	5.23	Filter Type and Size:	—	Pump Used:	MP-50 Bladder

Sampler Name: C Howard Signature: [signature] Date: 02·13·20
Reviewed by: SARA MEISSNER Signature: [signature] Date: 2/5/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 02·13·2020 Sheet 2 of 2

Well ID: GAF 444U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes =

Pump Settings (ID & psi or mV): #103, 30psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation:

Sample ID: GAFGWGAF444U 02132020

☑ Unfiltered ☐ Filtered ☐ Both

Filter ID: NA

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1120

Time (CT) last sample bottle placed on ice: 1140

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 7001725

Samples collected for the following analysis:

☐ Metals ☐ Dissolved Metals ☐ TSS ☐ TDS ☐ Anions ☐ General Chemistry ☐ Ra-226/Ra-228

☐ Dissolved Ra-226/Ra-228 ☐ TOC ☑ Other NRS Treatability

General Comments/Observations:

Fe: 5.5 mg/L, H_2S >2mg/L, CO_2=100 mg/L

CeH 2/13/20

Sampler Name: C Howard Signature: Date: 2·13·20

Reviewed by: SARA MEISSNER Signature: Date: 2/13/20

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~ 60621225
Groundwater Sampling Form (GWSF) Date: 3/18/20 Sheet 1 of 2

Well ID:	GAF-19R	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42.5 to 52.5	Initial Depth to Water (ft BTOC):	25.42	Total Depth (ft BTOC):	52.5
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JLM & COLEMAN HILL, CH							Start Purge Time (CT):	0748

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0750	0.240	25.42	47.5	14.6	7.52	2845	1.08	10.8	456.6	58.1
0755	0.240	26.10	47.5	15.3	7.87	7635	0.49	4.9	413.1	54.3
0800	0.240	26.12	47.5	15.4	3.21	2630	0.29	2.9	372.3	52.9
0805	0.240	26.13	47.5	15.5	3.34	2625	0.14	1.4	335.1	53.6
0810	0.240	26.14	47.5	15.5	3.36	2639	0.13	1.3	328.7	52.6
0815	0.240	26.16	47.5	15.5	3.41	2652	0.12	1.2	320.8	54.1
0820	0.240	26.16	47.5	15.5	3.44	2679	0.10	1.0	312.9	55.2

3/18/20 JLM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0820	0.240	26.16	47.5	15.5	3.44	2679	0.10	1.0	312.9	55.2

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0	Ambient Air Temperature (°F):	50°		
Sample Time (CT):	0820	Pump Duration (mins) - i.e., total time pump ran during sample collection	250	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	26.24	Final Turbidity: 35.8	Filter Type and Size: N/A	Pump Used:	MP-50: 1525 PUMP: DEDICATED

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 3/18/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 3/19/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 3/18/20 Sheet 2 of 2

Well ID: GAF-19R

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI:30

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 3/18/20 SLM

Sample ID GAF-GW-19R-03182020

☒ Unfiltered ☐ Filtered ☐ Both

Filter ID: N/A

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0825

Time (CT) last sample bottle placed on ice: 1235

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☐ Metals ☐ Dissolved Metals ☐ TSS ☐ TDS ☐ Anions ☐ General Chemistry ☐ Ra-226/Ra-228

☐ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other MRS TREATABILITY STUDY 3/18SLM

General Comments/Observations: 3/18/20

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 3/18/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 3/18/20

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~ 60621225

Groundwater Sampling Form (GWSF) Date: 3/17/20 Sheet 1 of 2

Well ID:	GAF-441U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	43 to 53	Initial Depth to Water (ft BTOC):	13.01	Total Depth (ft BTOC):	53
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JLM & COLEMAN HILL, CH							Start Purge Time (CT):	1143

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1145	0.100	13.70	48	15.9	2.40	6550	1.83	18.3	403.8	105
1150	0.100	14.02	48	15.4	2.79	6540	1.03	10.3	358.7	217
1155	0.100	14.29	48	15.5	3.07	6509	0.59	5.9	337.5	256
1200	0.100	14.61	48	15.4	3.28	6496	0.54	5.4	315.7	411
1205	0.100	14.89	48	15.3	3.41	6471	0.48	4.8	298.2	448
1210	0.100	15.06	48	15.2	3.51	6452	0.47	4.7	280.2	461
1215	0.100	15.30	48	15.3	3.57	6442	0.45	4.5	266.9	470

3/17/20 JLM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1215	0.100	15.30	48	15.3	3.57	6442	0.45	4.5	266.9	470

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0	Ambient Air Temperature (°F):	50°		
Sample Time (CT):	1215	Pump Duration (mins) - i.e., total time pump ran during sample collection	30	Color/ Odor	LIGHT BROWN
Final DTW (ft BTOC):	16.56	Final Turbidity: 223	Filter Type and Size: N/A	Pump Used:	MP-50: 1525 PUMP: 47677

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 3/17/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 3/17/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 3/17/20 Sheet 2 of 2

Well ID: GAF-441U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI:30

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 3/17/20 JLM

Sample ID GAF-GW-441U-03172020

☒ Unfiltered ☐ Filtered ☐ Both

Filter ID: N/A

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1230

Time (CT) last sample bottle placed on ice: 1245

Heavy equipment in area? ☒ Yes ☐ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# UNKNOWN

Samples collected for the following analysis:

☐ Metals ☐ Dissolved Metals ☐ TSS ☐ TDS ☐ Anions ☐ General Chemistry ☐ Ra-226/Ra-228

☐ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other NRS TREATABILITY STUDY 3/17 JLM

General Comments/Observations: 3/17/20

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 3/17/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 3/31/20

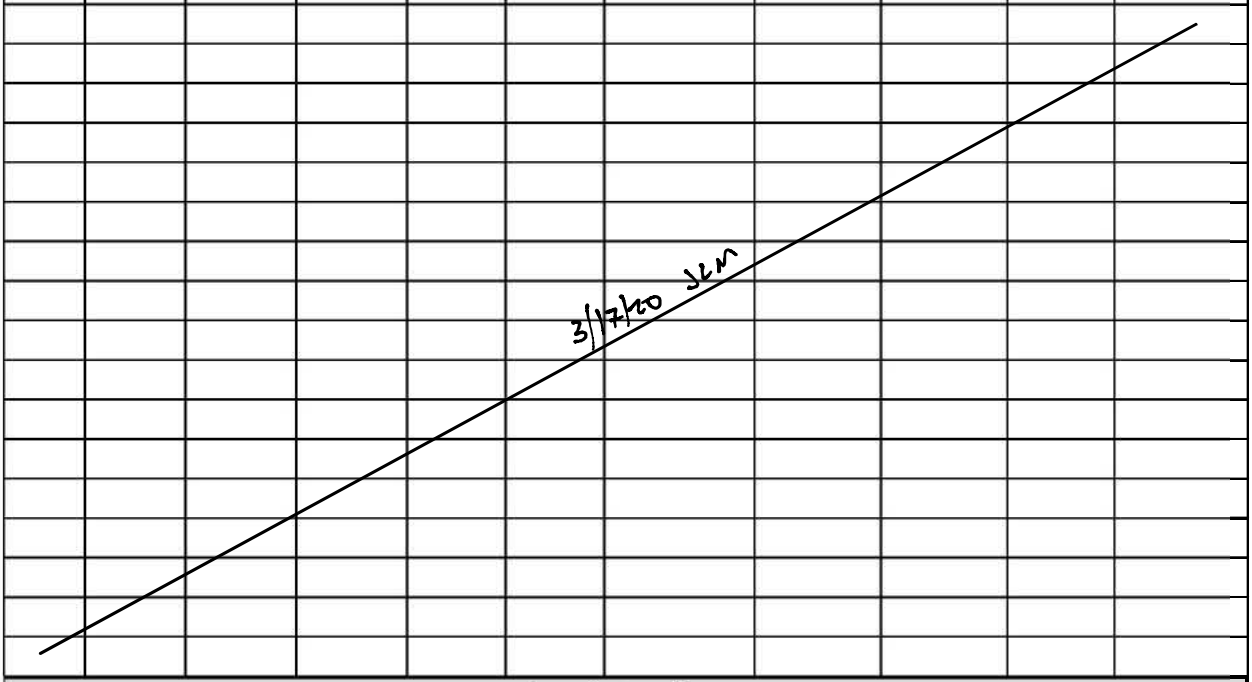
Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~ 60621225

Groundwater Sampling Form (GWSF) Date: 3/17/20 Sheet 1 of 2

Well ID:	GAF-44U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	53 to 63	Initial Depth to Water (ft BTOC):	36.00	Total Depth (ft BTOC):	63
Sample Team Members: Name/Affiliation/Initials:	AECOM: JONATHAN MOSHAL, JLM & COLEMAN HILL, CH							Start Purge Time (CT):	0818

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or <5
0830	0.100	36.00	58	14.3	4.69	2386	5.02	50.2	191.7	286
0835	0.100	36.69	58	16.2	3.99	2392	5.88	58.8	212.2	256
0840	0.100	37.20	58	16.4	3.91	2400	6.03	60.3	224.8	312
0845	0.100	37.81	58	16.3	3.89	2406	6.67	66.7	241.7	273
0850	0.100	38.33	58	16.3	3.88	2405	7.13	71.3	255.3	213
0855	0.100	38.78	58	16.4	3.86	2406	7.26	72.6	256.4	221
0900	0.100	39.21	58	16.4	3.86	2405	7.37	73.7	259.2	224



Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0900	0.100	39.21	58	16.4	3.86	2405	7.37	73.7	259.2	224

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.0			Ambient Air Temperature (°F):	50°		
Sample Time (CT):	0900	Pump Duration (mins) - i.e., total time pump ran during sample collection	105			Color/ Odor	LIGHT BROWN
Final DTW (ft BTOC):	49.20	Final Turbidity:	108	Filter Type and Size:	N/A	Pump Used:	MP-50: 1525 PUMP: 47677

Sampler Name: JONATHAN MOSHAL Signature: Jonathan Moshal Date: 3/17/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 3/ 1/20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 3/17/20 Sheet 2 of 2

Well ID: GAF-444V

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID:103 PSI:30

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 3/17/20 SLM

Sample ID GAF-GW-444V - 03172020

☒ Unfiltered ☐ Filtered ☐ Both

Filter ID: N/A

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0905

Time (CT) last sample bottle placed on ice: 1050

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# UNKNOWN

Samples collected for the following analysis:

☐ Metals ☐ Dissolved Metals ☐ TSS ☐ TDS ☐ Anions ☐ General Chemistry ☐ Ra-226/Ra-228

☐ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other NRS TREATABILITY STUDY 3/17 SLM

General Comments/Observations: 3/17/20

Sampler Name: JONATHAN MOSHER Signature: Jonathan Mosher Date: 3/17/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 3/ /20

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 4/22/20 Sheet 1 of 2

Well ID:	19R	Well Diameter (in):	2"	Screen Inteval (ft BTOC):	42 to 52	Initial Depth to Water (ft BTOC):	25.84	Total Depth (ft BTOC):	52
Sample Team Members: Name/Affiliation/Initials:	ETHAN HOUSE / EAH / AECOM / GEOLOGIST COLEMAN HILL / CH / AECOM / FIELD SCIENTIST							Start Purge Time (CT):	0740

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (~~µS~~ mS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0750	.240	26.61	47	15.2	3.13	2.77	5.25	52.8	350.9	118
0755	.240	26.71	47	15.4	3.33	2.77	1.32	13.0	321.2	90.7
0800	.240	26.77	47	15.5	3.41	2.85	0.65	6.6	286.7	64.3
0805	.240	26.81	47	15.5	3.43	2.89	0.64	6.5	277.3	48.3
0810	.240	26.86	47	15.5	3.44	2.90	0.48	4.8	274.6	38.5
0815	.240	26.87	47	15.5	3.45	2.92	0.40	4.0	269.8	32.9
0820	.240	26.87	47	15.5	3.46	2.94	0.33	3.3	266.2	31.0
0825	.240	26.88	47	15.6	3.47	2.95	0.29	2.9	264.0	26.9
0830	.240	26.92	47	15.6	3.47	2.95	0.30	3.0	263.2	27.1
0835	.240	26.93	47	15.5	3.47	2.95	0.24	2.4	262.4	22.2
0840	.240	26.90	47	15.5	3.48	2.96	0.23	2.3	261.7	22.2
0845	.240	26.91	47	15.6	3.48	2.96	0.23	2.3	261.1	20.2
0850	.240	26.91	47	15.6	3.48	2.97	0.24	2.4	259.9	17.7
0855	.240	26.91	47	15.7	3.48	2.97	0.22	2.2	259.4	17.7
0900	.240	26.91	47	15.6	3.48	2.97	0.20	2.1	259.2	15.3
0905	.240	26.91	47	15.6	3.49	2.97	0.22	2.2	258.4	15.6
0910	.240	26.91	47	15.7	3.49	2.97	0.22	2.3	258.1	14.1
0915	.240	26.91	47	15.7	3.49	2.98	0.24	2.4	257.2	12.8
0920	.240	26.91	47	15.7	3.49	2.97	0.22	2.3	257.3	12.8
0925	.240	26.91	47	15.8	3.49	2.97	0.26	2.6	257.2	12.5
1202	.240	26.50	47	16.3	3.49	2.97	1.33	13.9	261.2	25.2

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0940	.240	26.91	47	15.8	3.49	2.97	0.26	2.6	257.2	12.5

Additional Purge/Sample Data

Total Volume Purged (gal):	9 GALLONS			Ambient Air Temperature (°F):	64° F		
Sample Time (CT):	0940	Pump Duration (mins) - i.e., total time pump ran during sample collection	138			Color/ Odor	CLEAR/NO ODOR
Final DTW (ft BTOC):	26.50	Final Turbidity:	25.2	Filter Type and Size:	.045	Pump Used:	MP-50

Sampler Name: COLEMAN HILL Signature: Coleman Hill Date: 4/22/20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 4/22/20 Sheet 2 of 2

Well ID: 19R

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID: 103 PSI: 40

Stability reached? ☒ Yes ☐ No

If no, provide explanation: N/A

Sample ID: GAF-GW-53-04222020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2073

MS/MSD collected? ☒ Yes ☐ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0943

Time (CT) last sample bottle placed on ice: 1201

all samples on ice and custody sealed w/in 15 min.

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☐ Other

General Comments/Observations: 12 1Liter HNO3, 3 500mL unPres, 6 250mL UnPres, 6 250mL HNO3 3 250 UNPRES, 3 250mL ZN ACETATE, 6 250 SULFURIC, 3 500mL SULFURIC, 6 VOAS-SULFURIC

Sampler Name: COLEMAN HILL Signature: Coleman Hill Date: 4/22/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~ 60627477

Groundwater Sampling Form (GWSF) Date: 22 APRIL 2020 Sheet 1 of 2

Well ID:	20	Well Diameter (in):	2"	Screen Inteval (ft BTOC):	45.0 to 55.0	Initial Depth to Water (ft BTOC):	24.54	Total Depth (ft BTOC):	55.0
Sample Team Members: Name/Affiliation/Initials:	ASIA PITZER / AECOM / ALP NIELS HEIDNER / AECOM / NH							Start Purge Time (CT):	0753

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0800	.260	24.87	50.0	15.4	6.72	1.78	1.88	18.9	32.2	2.30
0805	.100	24.82	50.0	15.3	6.31	1.77	1.29	13.0	12.6	2.29
0810	.100	24.82	50.0	15.4	6.26	1.76	1.67	16.9	8.4	1.90
0815	.112	24.85	50.0	15.6	6.17	1.76	1.15	11.6	7.3	1.43
0820	.160	24.85	50.0	15.6	6.16	1.77	0.97	9.9	6.9	1.34
0825	.100	24.85	50.0	15.5	6.13	1.77	0.93	9.4	7.8	0.96
0830	.112	24.87	50.0	15.6	6.11	1.78	0.84	8.5	7.8	0.75
0835	.100	24.87	50.0	15.8	6.10	1.78	0.76	7.7	7.5	0.68
0840	.112	24.87	50.0	15.8	6.09	1.79	0.59	6.0	7.1	0.61
0845	.112	24.87	50.0	15.8	6.08	1.79	0.59	5.9	7.0	0.53
0850	.112	24.87	50.0	16.0	6.07	1.80	0.51	5.2	6.6	0.77
0855	.112	24.87	50.0	16.0	6.05	1.80	0.47	4.8	7.3	0.69
0900	.112	24.87	50.0	16.0	6.04	1.80	0.43	4.2	6.8	0.87
0905	.112	24.87	50.0	16.1	6.04	1.80	0.43	4.4	6.7	1.20

A Pitzer 4/22/20

Sample Readings

0905	.112	24.87	50.0	16.1	6.04	1.80	0.43	4.4	6.7	1.20
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):				Ambient Air Temperature (°F):			54°F
Sample Time (CT):	0905	Pump Duration (mins) - i.e., total time pump ran during sample collection			247	Color/ Odor	CLEAR/ NONE
Final DTW (ft BTOC):	25.04	Final Turbidity:	2.59	Filter Type and Size:	.45 µm	Pump Used:	MP-50 S/N: 2032 DEDICATED

Sampler Name: ASIA PITZER Signature: A Pitzer Date: 4/22/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: 4/24/20

POST-SAMPLE READINGS:	TEMP (°C)	pH (s.u.)	Sp.Con (mS/cm)	DO (mg/L)	DO (%)	ORP (mV)
	17.7	5.84	1.86	0.66	6.9	20.2

136

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620 6059504

Groundwater Sampling Form (GWSF) Date: 22 APRIL 2020 Sheet 2 of 2

Well ID: 20

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = _____

Pump Settings (ID & psi or mV): ID: 102 + 27.5 psi

Stability reached? ☒ Yes ☐ No

If no, provide explanation: _____

Sample ID: GAF-GW-20-04222020

Field Blank ID: GAF-AQ-900C-04222020
Time: 1000
Test America DI water fill/ship date

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: BATCH AMJ 12-11-19
LOT NO A 2073

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☒ Yes ☐ No Field Duplicate ID: GAF-GW-903C-04222020

Field Duplicate Sample Time (CT): _____

Time (CT) first sample bottle placed on ice: 0912

Time (CT) last sample bottle placed on ice: 1146

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# 74148-500R

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other _____

General Comments/Observations: 250-mL Total Metals w/ nitric (x1), 1-L Radium w/ nitric (x2), 250-mL Total Dissolved Metals w/ nitric (x1), 1-L Dissolved Radium w/ nitric (x2), 250-mL Anions unpreserved (x1), 500-mL TDS unpreserved (x1), 1-L TSS unpreserved (x2)

Sampler Name: ASIA PITZER Signature: A Pitzer Date: 4/22/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~ 60627477

Groundwater Sampling Form (GWSF) Date: 23 APRIL 2020 Sheet 1 of 2

Well ID:	22	Well Diameter (in):	2"	Screen Inteval (ft BTOC):	42.0 to 52.0	Initial Depth to Water (ft BTOC):	25.68	Total Depth (ft BTOC):	52.0
Sample Team Members: Name/Affiliation/Initials:	ASIA PITZER / AECOM / ALP NIELS HEIDNER / AECOM / NH							Start Purge Time (CT):	0808

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0815	.100	26.42	47.0	16.6	7.55	0.527	2.45	25.0	138.5	2.66
0820	.108	27.28	47.0	16.8	7.26	0.546	1.50	15.4	92.6	1.69
0825	.100	27.69	47.0	16.9	7.20	0.547	1.40	14.5	86.0	1.40
0830	.100	28.17	47.0	16.9	7.12	0.547	1.73	17.6	77.9	0.92
0835	.100	28.55	47.0	17.0	7.11	0.543	1.85	19.0	76.7	1.09
0840	.120	29.11	47.0	17.2	7.10	0.541	1.84	19.5	75.0	0.80
0845	.108	29.37	47.0	17.2	7.08	0.538	1.88	19.4	74.8	0.80

A Pul 4/23/20

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0845	.108	29.37	47.0	17.2	7.08	0.538	1.88	19.4	74.8	0.80

Additional Purge/Sample Data

Total Volume Purged (gal):				Ambient Air Temperature (°F):			59°F
Sample Time (CT):	0845	Pump Duration (mins) - i.e., total time pump ran during sample collection			133	Color/ Odor	CLEAR / NONE
Final DTW (ft BTOC):	37.02	Final Turbidity:	0.53	Filter Type and Size:	.45 µm	Pump Used:	MP-50 S/N: 2032 DEDICATED

.112

Sampler Name: ASIA PITZER Signature: A Pul Date: 4/23/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

POST-SAMPLE READINGS:	TEMP (°C)	pH (s.u.)	Sp Con (mS/cm)	DO (mg/L)	DO (%)	ORP (mV)
	17.3	7.12	0.526	2.84	29.3	69.4

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620 6059504

Groundwater Sampling Form (GWSF) Date: 23 APRIL 2020 Sheet 2 of 2

Well ID: 22

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = _____

Pump Settings (ID & psi or mV): ID: 103 + 25 psi

Stability reached? ☒ Yes ☐ No

If no, provide explanation: _____

Sample ID: GAF-GW-22-04232020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: BATCH AMJ 12-11-19
LOT NO A 2073

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: _____

Field Duplicate Sample Time (CT): _____

Time (CT) first sample bottle placed on ice: 0852

Time (CT) last sample bottle placed on ice: 1011

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# 74148-500R

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other _____

General Comments/Observations: 250-mL Total Metals w/ nitric (x1), 1-L Radium w/ nitric (x2), 250-mL Total Dissolved Metals w/ nitric (x1), 1-L Dissolved Radium w/ nitric (x2), 250-mL Anions unpreserved (x1), 500-mL TDS unpreserved (x1), 1-L TSS unpreserved (x2)

Sampler Name: ASIA PITZER Signature: A Pitzer Date: 4/23/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 4/22/20 Sheet 1 of 2

Well ID:	26	Well Diameter (in):	2"	Screen Inteval (ft BTOC):	96 to 106	Initial Depth to Water (ft BTOC):	17.42	Total Depth (ft BTOC):	106
Sample Team Members: Name/Affiliation/Initials:	ETHAN HOUSE / EAH / AECOM / GEOLOGIST COLEMAN HILL / CH / AECOM / FIELD SCIENTIST							Start Purge Time (CT):	1305

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1315	.140	17.68	101	16.7	6.55	1093	1.06	10.9	-34.4	130
1320	.140	17.70	101	16.8	6.62	929	0.96	9.9	-45.0	38.6
1325	.140	17.70	101	16.7	6.65	914	0.92	9.6	-51.8	23.9
1330	.140	17.70	101	16.8	6.72	902	0.91	9.4	-74.5	18.3
1335	.140	17.70	101	16.8	6.81	899	0.85	8.8	-93.2	13.8
1340	.140	17.70	101	16.6	6.90	916	0.80	8.2	-133.7	15.0
1345	.140	17.70	101	16.7	6.93	932	0.78	8.1	-144.3	4.92
1350	.140	17.70	101	16.7	6.96	966	0.76	8.1	-156.1	7.92
1355	.140	17.70	101	16.7	6.99	995	0.77	7.9	-156.2	14.1
1400	.140	17.70	101	16.7	7.01	1019	0.76	7.8	-155.5	25.4
1405	.140	17.70	101	16.7	7.02	1041	0.75	7.8	-156.5	27.0
1410	.140	17.70	101	16.8	7.03	1060	0.71	7.4	-155.3	34.1
1415	.140	17.70	101	16.8	7.03	1080	0.67	6.9	-153.6	26.0
1420	.140	17.70	101	16.8	7.04	1088	0.63	6.5	-153.1	24.0
1425	.140	17.70	101	16.8	7.04	1099	0.60	6.2	-152.0	21.4
1430	.140	17.70	101	16.8	7.02	1110	0.57	5.8	-146.9	21.1
1435	.140	17.70	101	16.7	7.04	1112	0.55	5.6	-145.2	21.9
1535	.140	17.73	101	16.1	6.91	1164	0.65	6.6	-136.7	39.8

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1440	.140	17.70	101	16.7	7.04	1112	0.55	5.6	-145.2	21.9

Additional Purge/Sample Data

Total Volume Purged (gal):	3.0	Ambient Air Temperature (°F):	70°F
Sample Time (CT):	1440	Pump Duration (mins) - i.e., total time pump ran during sample collection	46
Color/ Odor	CLEAR/NO ODOR		
Final DTW (ft BTOC):	17.73	Final Turbidity:	39.8
Filter Type and Size:	.045	Pump Used:	MP-50

Sampler Name: COLEMAN HILL Signature: Coleman Hill Date: 4/22/20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 4/22/20 Sheet 2 of 2

Well ID: 26

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID: 103 PSI: 40

Stability reached? ☒ Yes ☐ No

If no, provide explanation: N/A

Sample ID: GAF-GW-26-04222020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: N/A

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1445

Time (CT) last sample bottle placed on ice: 1531

all samples on ice and custody sealed w/in 15 min.

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☐ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☐ Dissolved Ra-226/Ra-228 ☒ TOC ☐ Other

General Comments/Observations: 4 1L Hdpe HNO3, 1 500mL unPres, 1 250mL UnPres, 2 250mL HNO3 2 1L UNPRESERVED

Sampler Name: COLEMAN HILL Signature: Coleman Hill Date: 4/22/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~ 60627477

Groundwater Sampling Form (GWSF) Date: 22 APRIL 2020 Sheet 1 of 2

Well ID:	27	Well Diameter (in):	2"	Screen Inteval (ft BTOC):	80.0 to 90.0	Initial Depth to Water (ft BTOC):	19.01	Total Depth (ft BTOC):	90.0
Sample Team Members: Name/Affiliation/Initials:	ASIA PITZER / AECOM / ALP NIELS HEIDNER / AECOM / NH							Start Purge Time (CT):	1205

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1215	.140	20.22	85.0	17.6	6.67	1.91	1.89	19.9	-93.0	0.95
1220	.120	21.38	85.0	17.5	6.56	1.92	1.07	11.1	-40.6	0.44
1225	.100	21.90	85.0	17.6	6.57	1.92	1.01	10.6	-37.1	0.37
1230	.100	22.51	85.0	17.8	6.57	1.92	0.95	10.1	-35.3	0.34
1235	.108	23.64	85.0	17.4	6.57	1.93	0.83	8.7	-29.4	0.33
1240	.108	24.27	85.0	17.4	6.59	1.93	0.77	8.0	-25.9	0.24
1245	.108	25.22	85.0	17.7	6.60	1.94	0.68	7.1	-22.5	0.23
1250	.108	25.74	85.0	17.9	6.62	1.95	0.65	6.9	-20.5	0.23
1255	.108	26.46	85.0	18.1	6.62	1.95	0.61	6.5	-19.0	0.21
1300	.108	26.98	85.0	18.2	6.64	1.95	0.57	6.0	-18.6	0.20
1305	.108	27.34	85.0	18.4	6.65	1.96	0.52	5.4	-18.9	0.37
1310	.108	27.89	85.0	18.5	6.67	1.95	0.49	5.0	-19.4	0.56
1315	.108	28.28	85.0	18.4	6.67	1.97	0.36	3.9	-17.4	1.08
1320	.108	29.27	85.0	18.1	6.66	1.98	0.29	3.0	-21.9	0.31

A Pal 4/22/20

Sample Readings

1320	.108	29.27	85.0	18.1	6.66	1.98	0.29	3.0	-21.9	0.31
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):				Ambient Air Temperature (°F):		65 °F	
Sample Time (CT):	1320	Pump Duration (mins) - i.e., total time pump ran during sample collection	1506			Color/ Odor	CLEAR/ NONE
Final DTW (ft BTOC):	32.68	Final Turbidity:	0.45	Filter Type and Size:	.45 µm	Pump Used:	MP-50 S/N: 2032 DEDICATED

Sampler Name: ASIA PITZER Signature: A Pal Date: 4/22/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

POST-SAMPLE READINGS:	TEMP (°C)	pH (s.u.)	Sp.Con (mS/cm)	DO (mg/L)	DO (%)	ORP (mV)
	17.9	6.55	1.94	0.34	3.6	-3.3

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620 6059504

Groundwater Sampling Form (GWSF) Date: 22 APRIL 2020 Sheet 2 of 2

Well ID: 27

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = _____

Pump Settings (ID & psi or mV): ID: 102 + 40 psi

Stability reached? ☒ Yes ☐ No

If no, provide explanation: _____

Sample ID: GAF-GW-27-04222020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: BATCH AMJ 12-11-19 LOT NO A 2073

Filter Blank ID: GAF-AQ-901C-04222020
Time: 1420
Pine Environmental
Batch AMJ 12-11-19
Lot No. A 2073

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: _____

Field Duplicate Sample Time (CT): _____

Time (CT) first sample bottle placed on ice: 1327

Time (CT) last sample bottle placed on ice: 1450

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# 74148-500R

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other _____

General Comments/Observations: 250-mL Total Metals w/ nitric (x1), 1-L Radium w/ nitric (x2), 250-mL Total Dissolved Metals w/ nitric (x1), 1-L Dissolved Radium w/ nitric (x2), 250-mL Anions unpreserved (x1), 500-mL TDS unpreserved (x1), 1-L TSS unpreserved (x2)

Sampler Name: ASIA PITZER Signature: A Pitzer Date: 4/22/20

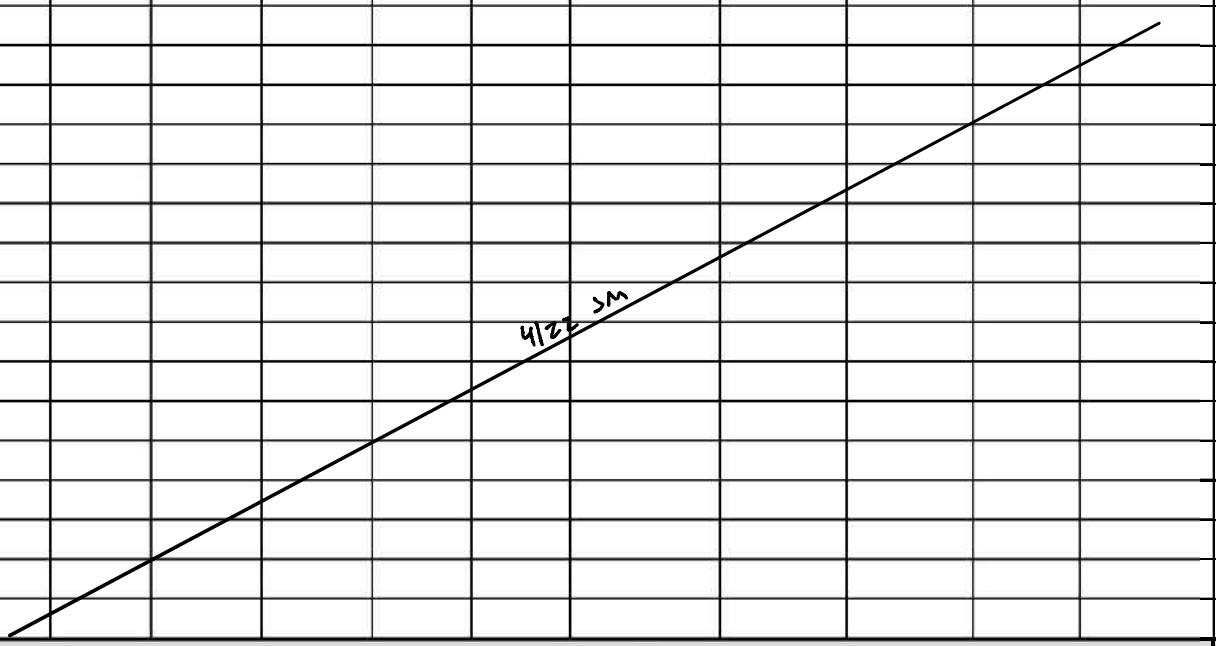
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60621225
Groundwater Sampling Form (GWSF) Date: 4/22/20 Sheet 1 of 2

Well ID:	GAF-439V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	32.5 to 37.5	Initial Depth to Water (ft BTOC):	2.65	Total Depth (ft BTOC):	37.5
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOWARD/CH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0755

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0755	0.120	2.74	35	14.7	7.08	1825	2.51	25.1	-25.8	77.3
0800	0.100	3.34	35	14.6	6.97	1851	1.65	16.5	-40.2	85.2
0805	0.100	3.65	35	14.6	6.77	1868	1.03	10.3	-55.4	103
0810	0.100	3.76	35	14.8	6.72	1877	0.81	8.1	-65.2	128
0815	0.100	3.80	35	15.0	6.71	1880	0.61	6.1	-68.2	236
0820	0.100	3.84	35	15.1	6.70	1882	0.54	5.4	-70.1	242
0825	0.100	3.89	35	15.1	6.69	1885	0.49	4.9	-72.9	249
0830	0.100	3.92	35	15.1	6.68	1886	0.47	4.7	-74.5	247



Sample Readings

0835	0.100	3.94	35	15.1	6.67	1887	0.45	4.5	-76.2	252

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~1	Ambient Air Temperature (°F):	60 °F		
Sample Time (CT):	0835	Pump Duration (mins) - i.e., total time pump ran during sample collection	125	Color/ Odor	LIGHT BROWN
Final DTW (ft BTOC):	3.92	Final Turbidity: 372	Filter Type and Size: 0.45	Pump Used:	MP50: 046692 PUMP: 25726

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/22/20
Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]60621225
Groundwater Sampling Form (GWSF) Date: 4/22/20 Sheet 2 of 2

Well ID: GAF-439U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 4/22 JM

Pump Settings (ID & psi or mV): ID: 98 PSI: 20 4/22 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 4/22 JM

Sample ID: GAF-GW-439U-04222020

☐ Unfiltered ☒ Filtered ☐ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0840

Time (CT) last sample bottle placed on ice: 1040

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20200422_JLM 4/22JM

General Comments/Observations: 4/22 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/24/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477
Groundwater Sampling Form (GWSF) Date: 4/23/20 Sheet 1 of 2

Well ID:	GAF-440V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	44 to 54	Initial Depth to Water (ft BTOC):	10.43	Total Depth (ft BTOC):	54
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOWARD/CH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1140

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1140	0.100	10.43	49	16.3	6.55	1793	2.15	21.5	60.5	509
1145	0.100	11.67	49	16.2	6.55	1822	0.99	9.9	33.7	777
1150	0.100	11.91	49	16.3	6.55	1824	0.92	9.2	31.5	589
1155	0.100	12.22	49	16.3	6.56	1830	0.69	6.9	29.7	452
1200	0.100	12.51	49	16.3	6.56	1838	0.57	5.7	27.8	381
1205	0.100	12.60	49	16.3	6.56	1842	0.50	5.0	25.2	352
1210	0.100	12.68	49	16.3	6.56	1843	0.49	4.9	23.2	321
1215	0.100	12.76	49	16.3	6.56	1844	0.48	4.8	22.6	281
1220	0.100	12.85	49	16.4	6.56	1845	0.47	4.7	21.2	253
1225	0.100	12.87	49	16.5	6.56	1849	0.46	4.6	18.9	195
1230	0.100	12.92	49	16.5	6.56	1849	0.46	4.6	17.8	153
1235	0.100	12.95	49	16.5	6.55	1853	0.44	4.4	15.2	133
1240	0.100	12.98	49	16.6	6.54	1858	0.42	4.2	13.4	106
1245	0.100	13.02	49	16.5	6.55	1862	0.47	4.7	11.2	88.6
1250	0.100	13.04	49	16.5	6.55	1864	0.43	4.3	12.3	83.2
1255	0.100	13.06	49	16.5	6.54	1867	0.39	3.9	12.1	85.9
1300	0.100	13.08	49	16.5	6.54	1869	0.35	3.5	11.9	81.2
1305	0.100	13.10	49	16.5	6.54	1871	0.34	3.4	11.2	79.3
1310	0.100	13.12	49	16.5	6.54	1873	0.33	3.3	10.9	83.4
1315	0.100	13.15	49	16.5	6.53	1875	0.32	3.2	10.4	74.2
1320	0.100	13.17	49	16.6	6.53	1876	0.31	3.1	10.2	68.1
1325	0.100	13.18	49	16.6	6.53	1877	0.30	3.0	9.6	64.3
1330	0.100	13.19	49	16.6	6.53	1878	0.30	3.0	9.4	61.9
1335	0.100	13.21	49	16.6	6.53	1879	0.30	3.0	9.2	58.3
Sample Readings										
1340	1.00	13.22	49	16.6	6.53	1879	0.29	2.9	8.9	56.4
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~4	Ambient Air Temperature (°F):	60 °F		
Sample Time (CT):	1340	Pump Duration (mins) - i.e., total time pump ran during sample collection	90	Color/ Odor	LIGHT BROWN
Final DTW (ft BTOC):	13.23	Final Turbidity: 41.3	Filter Type and Size: 0.45	Pump Used:	MP50: 046692 PUMP: 25726

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/23/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60627477
Groundwater Sampling Form (GWSF) Date: 4/23/20 Sheet 2 of 2

Well ID: GAF-440U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 4/23 JM

Pump Settings (ID & psi or mV): ID:103 PSI:30 4/23 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 4/23 JM

Sample ID: GAF-GW-440U-04232020

☐ Unfiltered ☒ Filtered ☐ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1345

Time (CT) last sample bottle placed on ice: 1510

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF_DRE_20200423_JLM 4/23 JM

General Comments/Observations: GAF-AB-900B-04232020 COLLECTED AT 1300. GAF-AB-901B-04232020 COLLECTED AT 1315 USING DI WATER SUPPLIED BY TA ON 4/13/20. 4/23 JM

4/23 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/23/20
Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477
Groundwater Sampling Form (GWSF) Date: 4/24/20 Sheet 1 of 2

Well ID:	GAF-441 U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	43 to 53	Initial Depth to Water (ft BTOC):	12.65	Total Depth (ft BTOC):	53
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOWARD/CH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0715

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0715	0.100	12.65	48	16.3	2.64	7395	2.21	22.1	415.6	98.2
0720	0.100	13.31	48	16.6	2.64	7522	2.23	22.3	370.2	119
0725	0.100	13.84	48	16.9	3.29	7523	0.97	9.7	311.8	162
0730	0.100	14.40	48	16.9	3.38	7606	0.89	8.9	292.6	202
0735	0.100	14.61	48	17.1	3.40	7497	0.69	6.9	287.2	274
0740	0.100	14.74	48	17.3	3.41	7491	0.57	5.7	281.6	352
0745	0.100	15.01	48	17.1	3.39	7503	0.58	5.8	281.1	419
0750	0.100	15.18	48	17.3	3.35	7488	0.55	5.5	283.2	497
0755	0.100	15.37	48	17.5	3.31	7467	0.52	5.2	285.4	532
0800	0.100	15.59	48	17.6	3.27	7439	0.48	4.8	287.8	608
0805	0.100	15.77	48	17.6	3.27	7437	0.45	4.5	289.6	632
0810	0.100	15.92	48	17.6	3.26	7431	0.44	4.4	289.9	654
0815	0.100	16.15	48	17.7	3.25	7425	0.43	4.3	290.5	581
0820	0.100	16.35	48	17.7	3.25	7421	0.44	4.4	291.1	562
0825	0.100	16.54	48	17.7	3.24	7409	0.47	4.7	291.5	669
0830	0.100	16.74	48	17.5	3.24	7410	0.46	4.6	292.3	691
0835	0.100	16.93	48	17.5	3.25	7410	0.46	4.6	292.0	715
0840	0.100	17.13	48	17.4	3.26	7411	0.44	4.4	291.7	742
0845	0.100	17.32	48	17.4	3.26	7411	0.44	4.4	291.3	751
0850	0.100	17.51	48	17.3	3.26	7412	0.43	4.3	290.4	721
0855	0.100	17.72	48	17.3	3.27	7413	0.41	4.1	289.1	804
0900	0.100	17.90	48	17.3	3.28	7414	0.40	4.0	287.7	791
0905	0.100	18.07	48	17.3	3.26	7415	0.39	3.9	287.1	800
0910	0.100	18.24	48	17.3	3.28	7415	0.39	3.9	286.3	842
Sample Readings										
0915	0.100	18.31	48	17.2	3.29	7416	0.39	3.9	286.1	781
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~2.5	Ambient Air Temperature (°F):	60°F
Sample Time (CT):	0915	Pump Duration (mins) - i.e., total time pump ran during sample collection	95
Color/ Odor	LIGHT BROWN		
Final DTW (ft BTOC):	19.12	Final Turbidity:	453
Filter Type and Size:	0.45	Pump Used:	MP50: 046692 PUMP: 25726

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/24/20
Reviewed by: Signature: Date:

60627477

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]

Groundwater Sampling Form (GWSF) Date: 4/24/20 Sheet 2 of 2

Well ID: GAF-441U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 4/24 JM

Pump Settings (ID & psi or mV): ID:103 PSI:35 4/24 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 4/24 JM

Sample ID: GAF-GW-441U-04242020

☐ Unfiltered ☒ Filtered ☐ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0920

Time (CT) last sample bottle placed on ice: 1050

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF_DRE_20200424 SLM 4/24 JM

General Comments/Observations: GAF-AB-900B-04242020 COLLECTED AT 1000. GAF-AB-901B-04242020 COLLECTED AT 1015 USING DI WATER SUPPLIED BY TA ON 4/13/20. 4/24 JM

4/24 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/24/20

Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]60621225
Groundwater Sampling Form (GWSF) Date: 4/22/20 Sheet 1 of 2

Well ID:	GAF-442V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	62 to 72	Initial Depth to Water (ft BTOC):	40.46	Total Depth (ft BTOC):	72
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOWARD/CH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1200

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1200	0.100	40.49	67	20.1	6.99	2491	2.66	26.6	-35.6	150
1205	0.100	41.75	67	18.4	6.51	2525	0.87	8.7	-69.8	90.1
1210	0.100	42.43	67	18.3	6.40	2526	0.71	7.1	-78.2	52.3
1215	0.100	43.09	67	18.3	6.35	2527	0.60	6.0	-90.3	30.6
1220	0.100	43.82	67	18.3	6.33	2528	0.55	5.5	-100.3	25.2
1225	0.100	44.52	67	18.3	6.31	2529	0.49	4.9	-106.1	22.6
1230	0.100	45.16	67	18.3	6.30	2530	0.46	4.6	-111.2	24.1
1235	0.100	45.81	67	18.3	6.30	2527	0.43	4.3	-113.8	23.9

4/22 JM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1240	0.100	46.38	67	18.3	6.29	2528	0.41	4.1	-116.1	25.0

Additional Purge/Sample Data

Total Volume Purged (gal):	~1	Ambient Air Temperature (°F):	64°F
Sample Time (CT):	1240	Pump Duration (mins) - i.e., total time pump ran during sample collection	135
Color/Odor	OPAQUE		
Final DTW (ft BTOC):	54.23	Final Turbidity:	16.6
Filter Type and Size:	0.45	Pump Used:	MP50: 046692 PUMP: 25726

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/22/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60621225
Groundwater Sampling Form (GWSF) Date: 4/22/20 Sheet 2 of 2

Well ID: GAF-442U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 4/22 JM

Pump Settings (ID & psi or mV): ID:103 PSI:30 4/22 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 4/22 JM

Sample ID: GAF-GW-442U-04222020

☐ Unfiltered ☒ Filtered ☐ Both

Filter ID: A 2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1245

Time (CT) last sample bottle placed on ice: 1455

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20200422_JLM 4/22JM

General Comments/Observations: GAF-AB-900B-04222020 COLLECTED AT 1445 . GAF-AB-901B-04222020 COLLECTED AT 1500 USING DI WATER SUPPLIED BY TA ON 4/13/20. 4/22JM

4/22 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/22/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 4/24/20 Sheet 1 of 2

Well ID:	GAF-444 U	Well Diameter (in):	2"	Screen Inteval (ft BTOC):	53 to 63	Initial Depth to Water (ft BTOC):	35.74	Total Depth (ft BTOC):	63
Sample Team Members: Name/Affiliation/Initials:	ETHAN HOUSE / EAH / AECOM / GEOLOGIST COLEMAN HILL / CH / AECOM / FIELD SCIENTIST							Start Purge Time (CT):	0725

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance ~~(µS/cm)~~ mS/cm	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0735	.100	36.28	58	17.3	4.46	2.63	3.53	36.5	199.3	219
0740	.100	36.96	58	17.3	4.45	2.63	3.02	31.7	199.5	227
0745	.100	37.80	58	17.4	4.44	2.63	0.94	9.9	201.3	174
0750	.100	38.60	58	17.4	4.44	2.63	0.91	9.5	201.1	78.5
0755	.100	38.95	58	17.5	4.48	2.62	199.4	0.54	5.7	45.8
0800	.100	39.30	58	17.5	4.48	2.62	0.50	5.3	200.3	35.4
0805	.100	39.94	58	17.6	4.43	2.62	0.43	4.6	204.1	25.6
0810	.100	40.56	58	17.5	4.34	2.62	0.37	3.9	212.6	23.6
0815	.100	40.93	58	17.5	4.32	2.62	0.36	3.7	214.6	23.8
0820	.100	41.32	58	17.5	4.30	2.61	0.33	3.5	217.3	23.7
1035	.100	49.09	58	17.2	4.17	2.61	0.47	4.8	248.5	39.2

Sample Readings

0825	.100	41.32	58	17.5	4.30	2.61	0.33	3.5	217.3	23.7

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	1.75	Ambient Air Temperature (°F):	59° F
Sample Time (CT):	0825	Pump Duration (mins) - i.e., total time pump ran during sample collection	122
Color/ Odor	CLEAR/NO ODOR		
Final DTW (ft BTOC):	49.09	Final Turbidity:	39.2
Filter Type and Size:	.45 MICRON	Pump Used:	MP15

Sampler Name: COLEMAN HILL Signature: Coleman Hill Date: 4/24/20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 4/24/20 Sheet 2 of 2

Well ID: GAF-444U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID: 103 PSI: 30

Stability reached? ☒ Yes ☐ No

If no, provide explanation: N/A

Sample ID: GAF-GW-444U-04242020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0829

Time (CT) last sample bottle placed on ice: 1031

all samples on ice and custody sealed w/in 15 min.

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☐ Other

General Comments/Observations: 4 1L-HDPE HNO3, 1 500mL UnPres, 2 250mL UnPres, 2 250mL HNO3 1 250 UNPRES, 1 250mL ZN ACETATE, 2 250 SULFURIC, 500mL SULFURIC, 2 VOAS - SULFURIC

Sampler Name: COLEMAN HILL Signature: Coleman Hill Date: 4/24/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~ 60627477

Groundwater Sampling Form (GWSF) Date: 23 APRIL 2020 Sheet 1 of 2

Well ID:	GAF-447U	Well Diameter (in):	2"	Screen Inteval (ft BTOC):	11.6 to 16.6	Initial Depth to Water (ft BTOC):	4.52	Total Depth (ft BTOC):	16.6
Sample Team Members: Name/Affiliation/Initials:	ASIA PITZER / AECOM / ALP NIELS HEIDNER / AECOM / NH							Start Purge Time (CT):	1052

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1055	.100	4.59	14.1	14.0	6.50	2.68	0.85	8.2	-6.0	829
1100	.100	5.02	14.1	13.9	6.45	2.67	0.59	5.6	-2.3	495
1105	.100	5.56	14.1	13.9	6.39	2.62	0.51	5.2	17.5	369
1110	.100	5.86	14.1	13.9	6.38	2.60	0.54	5.3	22.8	307
1115	.100	6.30	14.1	13.8	6.36	2.59	0.59	5.8	29.5	289
1120	.100	6.85	14.1	13.8	6.35	2.58	0.61	5.9	31.3	243
1125	.100	7.29	14.1	13.9	6.35	2.57	0.63	6.5	31.3	206

A Pal 4/23/20

Sample Readings

1125	.100	7.29	14.1	13.9	6.35	2.57	0.63	6.5	31.3	206
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):				Ambient Air Temperature (°F):			61 °F
Sample Time (CT):	1125	Pump Duration (mins) - i.e., total time pump ran during sample collection			144	Color/ Odor	CLEAR / NONE
Final DTW (ft BTOC):	11.26	Final Turbidity:	9.93	Filter Type and Size:	.45 µm	Pump Used:	MP-50 S/N: 2032 NON-DEDICATED

Sampler Name: ASIA PITZER Signature: A Pal Date: 4/23/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

POST-SAMPLE READINGS:	TEMP (°C)	pH (s.u.)	Sp.Con (mS/cm)	DO (mg/L)	DO (%)	ORP (mV)
	13.9	6.37	2.48	0.32	3.1	-3.8

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~ 6059504

Groundwater Sampling Form (GWSF) Date: 23 APRIL 2020 Sheet 2 of 2

Well ID: GAF-447U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = _____

Pump Settings (ID & psi or mV): ID: 103 + 10 psi

Stability reached? ☐ Yes ☒ No

If no, provide explanation: Collect sample before stabilization criteria met due to drawdown and shallow screen interval

Sample ID: GAF-GW-GAF-447U-04232020

Filter Blank ID: GAF-AQ-901C-04232020
Time: 1230
Pine Environmental
Batch AMJ 12-11-19
Lot No. A 2073

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: BATCH AMJ 12-11-19
LOT NO A 2073

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: _____

Field Duplicate Sample Time (CT): _____

Time (CT) first sample bottle placed on ice: 1132

Time (CT) last sample bottle placed on ice: 1312

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# 74148-500R

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other _____

General Comments/Observations: 250-mL Total Metals w/ nitric (x1), 1-L Radium w/ nitric (x2), 250-mL Total Dissolved Metals w/ nitric (x1), 1-L Dissolved Radium w/ nitric (x2), 250-mL Anions unpreserved (x1), 500-mL TDS unpreserved (x1), 1-L TSS unpreserved (x2)

Sampler Name: ASIA PITZER Signature: A Pitzer Date: 4/23/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~ 60627477

Groundwater Sampling Form (GWSF) Date: 23 APRIL 2020 Sheet 1 of 2

Well ID:	GAF-448U	Well Diameter (in):	2"	Screen Inteval (ft BTOC):	38.0 to 53.0	Initial Depth to Water (ft BTOC):	12.22	Total Depth (ft BTOC):	53.0
Sample Team Members: Name/Affiliation/Initials:	ASIA PITZER / AECOM / ALP NIELS HEIDNER / AECOM / NH							Start Purge Time (CT):	1335

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1340	.100	12.01	45.5	16.8	6.44	1.56	1.17	11.8	-112.7	96.6
1345	.100	12.74	45.5	16.8	6.46	1.59	0.56	5.9	-118.4	102
1350	.100	13.90	45.5	16.8	6.46	1.61	0.29	3.0	-122.6	107
1355	.100	14.70	45.5	16.8	6.47	1.61	0.25	2.5	-122.6	108
1400	.100	15.62	45.5	16.8	6.47	1.61	0.20	2.1	-122.4	97.4
1405	.100	16.27	45.5	16.8	6.48	1.61	0.19	2.0	-122.2	97.3
1410	.100	17.09	45.5	16.8	6.48	1.61	0.18	1.9	-122.4	98.2
1415	.100	17.54	45.5	16.7	6.49	1.61	0.17	1.7	-120.4	94.3
1420	.100	18.01	45.5	16.8	6.48	1.61	0.26	2.7	-117.1	89.6
1425	.100	18.42	45.5	16.8	6.49	1.61	0.16	1.6	-120.1	88.3
1430	.100	19.37	45.5	16.8	6.50	1.60	0.13	1.4	-122.4	75.7
1435	.100	20.26	45.5	16.8	6.52	1.60	0.11	1.1	-124.7	65.3

A Pitzer 4/23/20

Sample Readings

1435	.100	20.26	45.5	16.8	6.52	1.60	0.11	1.1	-124.7	65.3
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):				Ambient Air Temperature (°F):		61 °F	
Sample Time (CT):	1435	Pump Duration (mins) - i.e., total time pump ran during sample collection			155	Color/ Odor	CLEAR/ NONE
Final DTW (ft BTOC):	32.65	Final Turbidity:	101	Filter Type and Size:	.45 µm	Pump Used:	MP-50 S/N: 2032 NON-DEDICATED

Sampler Name: ASIA PITZER Signature: A Pitzer Date: 4/23/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

POST-SAMPLE READINGS:	TEMP (°C)	pH (s.u.)	Sp Con (mS/cm)	DO (mg/L)	DO (%)	ORP (mV)
	17.7	6.63	1.40	0.16	1.7	-108.6

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~ 6059504

Groundwater Sampling Form (GWSF) Date: 23 APRIL 2020 Sheet 2 of 2

Well ID: GAF-448U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = _____

Pump Settings (ID & psi or mV): ID: 103 + 30 psi

Stability reached? ☐ Yes ☒ No

If no, provide explanation: Collect sample before stabilization criteria met due to drawdown and shallow screen interval

Sample ID: GAF-GW-GAF-448U-04232020 20

Field Blank ID: GAF-AQ-900C-04232020
Time: 1530
Test America fill/ship date

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: BATCH AMJ 12-11-19
LOT NO A 2073

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: _____

Field Duplicate Sample Time (CT): _____

Time (CT) first sample bottle placed on ice: 1442

Time (CT) last sample bottle placed on ice: 1600

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# 74148-500R

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other _____

General Comments/Observations: 250-mL Total Metals w/ nitric (x1), 1-L Radium w/ nitric (x2), 250-mL Total Dissolved Metals w/ nitric (x1), 1-L Dissolved Radium w/ nitric (x2), 250-mL Anions unpreserved (x1), 500-mL TDS unpreserved (x1), 1-L TSS unpreserved (x2)

Sampler Name: ASIA PITZER Signature: A Pitzer Date: 4/23/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477
Groundwater Sampling Form (GWSF) Date: 4/23/20 Sheet 1 of 2

Well ID:	GAF-489V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	47 to 57	Initial Depth to Water (ft BTOC):	9.30	Total Depth (ft BTOC):	57
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOWARD/CH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0735

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0735	0.120	9.10	52	14.8	7.95	122.6	5.81	58.1	75.5	195
0740	0.120	9.52	52	14.8	6.96	107.2	3.44	34.4	98.5	321
0745	0.100	9.70	52	14.7	6.53	101.2	2.72	27.2	112.6	461
0750	0.100	10.50	52	14.8	6.23	103.5	2.58	25.8	126.0	525
0755	0.100	11.35	52	14.6	6.15	103.4	2.52	25.2	131.9	452
0800	0.100	12.07	52	14.6	6.09	101.6	2.41	24.1	137.4	431
0805	0.100	12.95	52	14.7	6.03	99.3	2.35	23.5	142.5	415
0810	0.100	13.45	52	14.7	5.96	98.5	2.31	23.1	149.1	373
0815	0.100	13.98	52	14.7	5.95	97.9	2.36	23.6	151.9	302
0820	0.100	14.52	52	14.8	5.95	96.2	2.41	24.1	153.2	248
0825	0.100	14.96	52	14.9	5.88	83.6	2.91	29.1	158.9	175
0830	0.100	15.40	52	14.9	5.84	77.9	3.19	31.9	161.7	105
0835	0.100	15.98	52	14.9	5.78	69.1	3.71	37.1	167.2	47.3
0840	0.100	16.72	52	15.0	5.77	67.2	3.80	38.0	169.2	38.2
0845	0.100	17.45	52	15.0	5.76	65.6	3.89	38.9	171.5	31.4
0850	0.100	18.01	52	15.0	5.75	65.9	3.93	39.3	173.5	26.2
0855	0.100	18.53	52	15.1	5.73	65.7	3.83	38.3	175.3	28.3
					4/23 JM					

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0900	0.100	19.04	52	15.1	5.75	66.5	3.87	38.7	175.5	28.6

Additional Purge/Sample Data

Total Volume Purged (gal):	~2			Ambient Air Temperature (°F):	60 °F		
Sample Time (CT):	0900	Pump Duration (mins) - i.e., total time pump ran during sample collection	110			Color/ Odor	LIGHT BROWN
Final DTW (ft BTOC):	28.65	Final Turbidity:	15.2	Filter Type and Size:	0.45	Pump Used:	MP50: 046692 PUMP: 25726

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/23/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60627477
Groundwater Sampling Form (GWSF) Date: 4/23/20 Sheet 2 of 2

Well ID: GAF-489U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 4/23 JM

Pump Settings (ID & psi or mV): ID:103 PSI:30 4/23 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 4/23 JM

Sample ID: GAF-GW-489U-04232020

☐ Unfiltered ☒ Filtered ☐ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0905

Time (CT) last sample bottle placed on ice: 1050

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF_DRE_20200423_JLM 4/23JM

General Comments/Observations: 4/23 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/23/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 4/23/20 Sheet 1 of 2

Well ID:	GAF-SZ6U	Well Diameter (in):	2"	Screen Inteval (ft BTOC):	63' to 68'	Initial Depth to Water (ft BTOC):	18.34	Total Depth (ft BTOC):	68'
Sample Team Members: Name/Affiliation/Initials:	ETHAN HOUSE/EAH/AECOM/GEOLOGIST COLEMAN HILL/CH/AECOM/FIELD SCIENTIST							Start Purge Time (CT):	1100

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance ~~(µS/cm)~~ mS/cm	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/-0.2	+/-0.1	+/-5%	Below 0.5 mg/L or +/-10%		NA	+/-10% or <5
1110	.100	18.85	65	15.5	6.54	1.25	0.93	9.4	-11.5	8.88
1115	.100	19.28	65	15.5	6.61	1.24	0.83	8.4	-15.4	5.71
1120	.100	19.68	65	15.6	6.68	1.24	0.69	7.0	-19.8	5.73
1125	.100	19.94	65	15.6	6.71	1.24	0.63	6.3	-21.8	5.60
1130	.100	20.22	65	15.6	6.73	1.24	0.58	5.8	-23.3	4.83
1135	.100	20.48	65	15.7	6.75	1.24	0.52	5.2	-25.3	5.65
1140	.100	20.68	65	15.7	6.76	1.24	0.48	4.9	-29.2	5.55
1145	.100	20.82	65	15.7	6.77	1.24	0.46	4.6	-35.8	6.43
1150	.100	21.05	65	15.7	6.78	1.24	0.41	4.2	-41.2	9.70
1155	.100	21.13	65	15.7	6.78	1.24	0.39	3.9	-42.0	11.7
1200	.100	21.24	65	15.7	6.79	1.24	0.36	3.7	-42.6	13.7
1205	.100	21.33	65	15.7	6.79	1.24	0.36	3.6	-44.2	15.0
1210	.100	21.36	65	15.7	6.79	1.24	0.35	3.5	-48.9	18.4
1215	.100	21.39	65	15.7	6.80	1.24	0.34	3.5	-56.8	17.4
1220	.100	21.48	65	15.7	6.81	1.24	0.31	3.2	-59.2	16.5
1225	.100	21.54	65	15.8	6.82	1.24	0.30	3.0	-65.0	16.8
1430	.100	21.96	65	15.7	6.89	1242	0.98	10.1	-41.6	15.7

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1230	.100	21.54	65	15.8	6.82	1242	0.30	3.0	-65.0	16.8

Additional Purge/Sample Data

Total Volume Purged (gal):	2.5			Ambient Air Temperature (°F):	63°F		
Sample Time (CT):	1230	Pump Duration (mins) - i.e., total time pump ran during sample collection	103			Color/ Odor	CLEAR/NO ODOR
Final DTW (ft BTOC):	21.96	Final Turbidity:	15.7	Filter Type and Size:	.45 MICRON	Pump Used:	MP15

Sampler Name: COLEMAN HILL Signature: Coleman Hill Date: 4/23/20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 4/23/20 Sheet 2 of 2

Well ID: GAF-526U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID: 103 PSI: 38

Stability reached? ☒ Yes ☐ No

If no, provide explanation: N/A

Sample ID: GAF-GW-526U-04232020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1241

Time (CT) last sample bottle placed on ice: 1424

all samples on ice and custody sealed w/in 15 min.

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# 012819

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☐ Other

General Comments/Observations: 4 1L Lite HNO3, 1 500mL UnPres, 2 250mL UnPres, 2 250mL HNO3 1 250 UNPRES, 1 250mL ZN ACETATE, 2 250 SULFURIC, 500mL SULFURIC, 2 VOAS - SULFURIC

Sampler Name: COLEMAN HILL Signature: Coleman Hill Date: 4/23/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477
Groundwater Sampling Form (GWSF) Date: 4/24/20 Sheet 1 of 2

Well ID:	GAF-541 V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	58 to 63	Initial Depth to Water (ft BTOC):	11.65	Total Depth (ft BTOC):	63
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOWARD/CH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1210

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1210	0.100	11.65	60.5	18.2	4.72	3175	3.11	31.1	86.3	64.8
1215	0.100	12.50	60.5	18.1	5.88	3970	1.35	13.5	-19.2	57.8
1220	0.100	13.31	60.5	18.2	5.96	4013	0.69	6.9	-35.1	46.2
1225	0.100	14.12	60.5	18.3	5.97	4015	0.50	5.0	-39.2	39.7
1230	0.100	14.91	60.5	18.4	5.99	4017	0.42	4.2	-48.0	35.9
1235	0.100	15.61	60.5	18.3	6.00	4019	0.41	4.1	-54.2	46.9
1240	0.100	16.31	60.5	18.3	6.01	4020	0.40	4.0	-59.5	51.2
1245	0.100	17.01	60.5	18.2	6.02	4019	0.38	3.8	-63.3	56.6
1250	0.100	17.62	60.5	18.3	6.02	4024	0.36	3.6	-65.2	52.3
1255	0.100	18.2	60.5	18.3	6.03	4030	0.34	3.4	-67.8	51.1

4/24 JM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1300	0.100	18.81	60.5	18.3	6.04	4032	0.33	3.3	-68.9	54.5

Additional Purge/Sample Data

Total Volume Purged (gal):	~1			Ambient Air Temperature (°F):	60°F		
Sample Time (CT):	1300	Pump Duration (mins) - i.e., total time pump ran during sample collection	75			Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	19.68	Final Turbidity:	54.5	Filter Type and Size:	0.45	Pump Used:	MP50: 046692 PUMP: 25726

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/24/20
Reviewed by: Signature: Date:

60627477

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]

Groundwater Sampling Form (GWSF) Date: 4/24/20 Sheet 2 of 2

Well ID: GAF-541U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 4/24 JM

Pump Settings (ID & psi or mV): ID: 98 PSI: 40 4/24 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 4/24 JM

Sample ID: GAF-GW-541U-04242020

☐ Unfiltered ☒ Filtered ☐ Both

Filter ID: AZ037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1305

Time (CT) last sample bottle placed on ice: 1415

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF_DRE_20200424 SLM 4/24 JM

General Comments/Observations: 4/24 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 4/24/20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 4/23/20 Sheet 1 of 2

Well ID:	S3	Well Diameter (in):	2"	Screen Inteval (ft BTOC):	51 to 61	Initial Depth to Water (ft BTOC):	24.42	Total Depth (ft BTOC):	61
Sample Team Members: Name/Affiliation/Initials:	ETHAN HOUSE / EAH / AECOM / GEOLOGIST COLEMAN HILL / CH / AECOM / FIELD SCIENTIST							Start Purge Time (CT):	0740

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0750	.130	25.15	56	15.1	3.88	2358	3.91	39.6	223.4	85.5
0755	.130	25.15	56	15.1	3.86	2349	3.31	33.1	229.5	61.9
0800	.130	25.20	56	15.1	3.83	2323	1.84	18.4	238.5	45.3
0805	.130	25.20	56	15.1	3.82	2250	1.32	13.2	249.0	33.2
0810	.130	25.20	56	15.1	3.82	2240	1.24	12.4	250.8	26.7
0815	.130	25.20	56	15.1	3.82	2239	1.09	10.8	254.3	22.0
0820	.130	25.20	56	15.2	3.81	2244	1.04	10.5	255.9	18.8
0825	.130	25.20	56	15.1	3.80	2269	0.86	8.5	260.4	17.5
0830	.130	25.20	56	15.3	3.79	2278	0.76	7.7	261.5	16.0
0835	.130	25.20	56	15.2	3.78	2291	0.68	6.8	263.4	12.9
0840	.130	25.20	56	15.3	3.78	2297	0.64	6.5	263.9	13.4
0845	.130	25.20	56	15.3	3.77	2308	0.59	5.8	264.1	12.6
0850	.130	25.20	56	15.4	3.77	2313	0.53	5.3	265.0	13.5
0855	.130	25.20	56	15.4	3.76	2327	0.45	4.5	264.7	12.2
0900	.130	25.20	56	15.4	3.76	2329	0.44	4.5	264.8	10.2
0905	.130	25.20	56	15.4	3.76	2336	0.41	4.1	264.4	9.32
0910	.130	25.20	56	15.4	3.76	2337	0.38	3.8	264.4	8.70
0915	.130	25.20	56	15.4	3.76	2343	0.35	3.5	263.5	8.30
0920	.130	25.20	56	15.4	3.76	2343	0.34	3.4	263.5	8.75
0935	.130	25.22	56	15.6	3.77	2363	0.48	4.9	263.4	10.6

Sample Readings

0925	.130	25.20	56	15.4	3.76	2343	0.34	3.4	263.5	8.75
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	4	Ambient Air Temperature (°F):	57°
Sample Time (CT):	0925	Pump Duration (mins) - i.e., total time pump ran during sample collection	69
Color/ Odor	CLEAR/NO ODOR		
Final DTW (ft BTOC):	25.22	Final Turbidity:	10.6
Filter Type and Size:	.45 MICRON	Pump Used:	MP15

Sampler Name: COLEMAN HILL Signature: Coleman Hill Date: 4/23/20

Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 4/23/20 Sheet 2 of 2

Well ID: S3

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A

Pump Settings (ID & psi or mV): ID: 103 PSI: 38

Stability reached? ☒ Yes ☐ No

If no, provide explanation: N/A

Sample ID: GAF-GW-S3-04232020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2073

MS/MSD collected? ☒ Yes ☐ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0925

Time (CT) last sample bottle placed on ice: 1034

all samples on ice and custody sealed w/in 15 min.

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# 012819

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☐ Other

General Comments/Observations: 4 1Liter HNO3, 1 500mL unPres, 2 250mL UnPres, 2 250mL HNO3 1 250 UNPRES, 1 250mL ZN ACETATE, 2 250 SULFURIC, 500mL SULFURIC, 2 VOAS-SULFURIC

Sampler Name: COLEMAN HILL Signature: Coleman Hill Date: 4/23/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 6·16·20 Sheet 1 of 2

Well ID:	GAF 19R	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42 to 52	Initial Depth to Water (ft BTOC):	27.43	Total Depth (ft BTOC):	52
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CSH-(AECOM), Coleman Hill CH AECOM 6.16.20							Start Purge Time (CT):	0755

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0805	0.240	28.81	47	16.1	3.40	2558	0.50	5.1	162.7	50
0810	0.240	28.90	47	16.1	3.58	2781	3.63	37.2	155.7	27.3
0815	0.240	28.92	47	16.1	3.60	3178	—	—	146.6	20.1
0820	0.240	28.95	47	16.1	3.72	3207	7.54	77.4	142.2	12.9
0825	0.240	29.01	47	16.1	3.72	3214	6.99	71.4	140.3	13.2
0830	0.240	28.80	47	16.3	3.71	3246	0.38	3.9	145.3	10.2
0835	0.240	28.88	47	16.1	3.63	3233	0.29	2.9	138.0	7.44
0840	0.240	28.88	47	16.2	3.65	3251	0.13	1.3	139.4	6.99
0845	0.240	28.95	47	16.2	3.65	3241	0.09	0.91	134.0	6.43
0850	0.240	28.98	47	16.2	3.66	3244	0.40	4.0	131.0	5.50
0855	0.240	29.0	47	16.2	3.66	3244	0.40	4.1	129.2	5.64
0900	0.240	29.02	47	16.2	3.67	3243	0.35	3.3	128.3	4.58
0905	0.240	29.02	47	16.2	3.75	3247	0.38	3.9	129.9	4.46
0910	0.240	29.02	47	16.2	3.77	3259	0.23	2.3	124.9	3.98
				6.16.20						
1020	0.240	29.02	47	16.5	3.81	3260	0.31	3.3	130.2	4.92

Sample Readings (Post collection)

0910	0.240	29.02	47	16.2	3.77	3259	0.23	2.3	124.9	3.98
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	6.5	Ambient Air Temperature (°F):	72		
Sample Time (CT):	0910	Pump Duration (mins) - i.e., total time pump ran during sample collection	65	Color/ Odor	Clear / No odor
Final DTW (ft BTOC):	29.09	Final Turbidity: 4.92	Filter Type and Size: NA	Pump Used:	Dedicated Bladder MP-50: 45877

Sampler Name: CHARLIE HOWARD Signature: Charlie Howard Date: 6/16/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 6.16.20 Sheet 2 of 2

Well ID: GAF 19R

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 6.16.20 CH

Pump Settings (ID & psi or mV): #102 , 30 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 6.16.20 CH

Sample ID: GAFGW 19R 06162020

☑ Unfiltered ☐ Filtered ☐ Both

Filter ID: NA

MS/MSD collected? ☑ Yes ☐ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 0920
Time (CT) last sample bottle placed on ice: 1015
} All w/in 15 min

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☐ Yes ☑ No

If yes, Lot# NA

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals ☐ Dissolved Metals ☑ TSS 3 ☑ TDS 4 ☑ Anions ☐ General Chemistry 2 ☑ Ra-226/Ra-228

☐ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other

General Comments/Observations: 13 bottles filled: Metals & Ra have HNO_3 as preservative
Metals & Anions: 250 mL. TDS: 500mL. Ra: 1000 mL.

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 06.16.20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 6·17·20 Sheet 1 of 2

Well ID:	GAF 20	Well Diameter (in):	2	Screen Inteval (ft BTOC):	45 to 55	Initial Depth to Water (ft BTOC):	25.18	Total Depth (ft BTOC):	55.0
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CH-(AECOM), Coleman Hill CH AECOM 6.17.20							Start Purge Time (CT):	1010

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1015	0.100	25.40	50	18.8	6.17	1833	4.46	48.2	140.7	6.32
1020	0.100	25.38	50	18.9	6.21	1736	1.20	12.9	82.6	8.38
1025	0.100	25.42	50	19.0	6.21	1730	1.01	10.4	75.2	8.81
1030	0.100	25.41	50	19.1	6.22	1720	0.94	10.2	68.4	9.10
1035	0.100	25.42	50	19.3	6.24	1727	0.77	8.2	60.1	7.11
1040	0.100	25.40	50	19.4	6.25	1730	0.66	7.2	56.5	5.58
1045	0.100	25.40	50	19.4	6.24	1737	0.57	7.0	52.1	4.88
1050	0.100	25.40	50	19.5	6.26	1747	0.55	6.8	51.8	3.08
1055	0.100	25.40	50	19.4	6.23	1743	0.49	5.1	51.4	2.79
1100	0.100	25.41	50	19.4	6.23	1745	0.49	5.1	51.1	2.61
1105	0.100	25.41	50	19.4	6.23	1744	0.48	5.0	50.8	2.60
1110	0.100	25.40	50	19.4	6.23	1746	0.48	5.2	50.5	2.54

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1110	0.100	25.40	50	19.4	6.23	1746	0.48	5.2	50.5	2.54

Additional Purge/Sample Data

Total Volume Purged (gal):	1.5			Ambient Air Temperature (°F):	77		
Sample Time (CT):	1110	Pump Duration (mins) - i.e., total time pump ran during sample collection		65	Color/ Odor	Clear/NA	
Final DTW (ft BTOC):	25.60	Final Turbidity:	5.24	Filter Type and Size:	0.45 µm	Pump Used:	Bladder (Dedicated) MP-50: 45877

Sampler Name: CHARLIE HOWARD Signature: Charles Howard Date: 6/17/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 6.17.20 Sheet 2 of 2

Well ID: GAF 20

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 6.17.20 CH

Pump Settings (ID & psi or mV): #99 , 20 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 6.17.20 CH

Sample ID: GAF GW 20 06 17 2020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1125
Time (CT) last sample bottle placed on ice: 1215
} All w/in 15 min

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☐ Yes ☑ No

If yes, Lot# NA

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 3 ☑ Ra-226/Ra-228

4 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other

General Comments/Observations: 16 bottles filled: Metals & Ra have HNO_3 as preservative
Metals & Anions: 250 mL. TDS: 500mL. Ra: 1000 mL.

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 06.17.20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 6·16·20 Sheet 1 of 2

Well ID:	GAF 22	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42 to 52	Initial Depth to Water (ft BTOC):	26.54	Total Depth (ft BTOC):	52
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CGH-(AECOM), Coleman Hill CH AECOM 6.16.20							Start Purge Time (CT):	1320

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1325	0.100	27.22	47	19.6	7.31	452.1	3.27	33.3	178.8	6.01
1330	0.100	28.45	47	19.4	7.28	444	3.01	31	175.5	3.42
1335	0.100	29.4	47	19.1	7.33	433	2.79	28.4	168.9	2.61
1340	0.100	30.42	47	19.0	7.34	419.07	2.24	24.1	166.7	1.05
1345	0.100	31.70	47	19.0	7.38	414.4	1.91	20.2	166.5	1.72
1350	0.100	32.50	47	19.1	7.38	412.3	1.89	19.4	167.7	1.26
1355	0.100	32.80	47	19.0	7.38	410.2	1.77	18.2	166.6	1.79

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1400	0.100	33.50	47	18.9	7.38	411.1	1.71	17.5	166.1	2.49

Additional Purge/Sample Data

Total Volume Purged (gal):	2.5			Ambient Air Temperature (°F):	79		
Sample Time (CT):	1400	Pump Duration (mins) - i.e., total time pump ran during sample collection	35			Color/ Odor	Clear/NA
Final DTW (ft BTOC):	41.09	Final Turbidity:	3.01	Filter Type and Size:	0.45 µm	Pump Used:	Dedicated Bladder MP-50: 45877

Sampler Name: CHARLIE HOWARD Signature: Charles Howard Date: 6/16/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 6.16.20 Sheet 2 of 2

Well ID: GAF 22

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 6.16.20 CH

Pump Settings (ID & psi or mV): #103, 25 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 6.16.20 CH

Sample ID: GAFGW 22 06162020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1410
Time (CT) last sample bottle placed on ice: 1445
} All w/in 15 min

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☐ Yes ☑ No

If yes, Lot# NA

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 3 ☐ Ra-226/Ra-228

4 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other

General Comments/Observations: 16 bottles filled: Metals & Ra have HNO_3 as preservative
Metals & Anions: 250 mL. TDS: 500mL. Ra: 1000 mL.

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 06.16.20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60621225.01

Groundwater Sampling Form (GWSF) Date: 6/19/20 Sheet 1 of 2

Well ID:	GAF-439V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	32.5 to 37.5	Initial Depth to Water (ft BTOC):	4.71	Total Depth (ft BTOC):	37.5
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0724

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0725	0.100	4.71	35	19.3	9.08	1661	6.35	63.5	22.8	27.4
0730	0.100	4.93	35	17.9	7.10	1791	1.63	16.3	-64.0	121
0735	0.100	5.31	35	17.8	6.66	1852	1.04	10.4	-78.6	876
0740	0.100	5.62	35	17.7	6.58	1865	0.49	4.9	-85.9	OR
0745	0.100	5.86	35	17.6	6.58	1870	0.41	4.1	-91.1	OR
0750	0.100	6.18	35	17.6	6.60	1871	0.37	3.7	-93.1	OR

Sample Readings

0755	0.100	6.45	35	17.6	6.60	1869	0.35	3.5	-93.3	OR
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	70 °F
Sample Time (CT):	0755	Pump Duration (mins) - i.e., total time pump ran during sample collection	105
Color/ Odor	OPAQUE		
Final DTW (ft BTOC):	6.52	Final Turbidity:	OR
Filter Type and Size:	0.45	Pump Used:	MP50: 033213 PUMP: 8288

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/19/20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60621225.01
Groundwater Sampling Form (GWSF) Date: 6/19/20 Sheet 2 of 2

Well ID: GAF-439U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 6/19 JM

Pump Settings (ID & psi or mV): ID:98 PSI:20 6/19 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 6/19 JM

Sample ID: GAF-GW-439U-0619 2020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A 2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0800

Time (CT) last sample bottle placed on ice: 0940

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF_DRE_20200619_JLM 6/19 JM

General Comments/Observations: 6/19/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/19/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]60621225.01
Groundwater Sampling Form (GWSF) Date: 6/18/20 Sheet 1 of 2

Well ID:	GAF-440V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	44 to 54	Initial Depth to Water (ft BTOC):	12.51	Total Depth (ft BTOC):	54
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1055

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1055	0.100	12.51	49	20.8	6.42	1743	1.99	19.9	-27.0	OR
1100	0.100	12.65	49	20.2	6.43	1762	1.24	12.4	-25.9	OR
1105	0.100	12.80	49	19.8	6.45	1790	0.92	9.2	-25.2	OR
1110	0.100	12.93	49	19.6	6.46	1796	0.76	7.6	-24.8	OR
1115	0.100	13.07	49	19.5	6.46	1798	0.66	6.6	-24.5	OR
1120	0.100	13.21	49	19.4	6.46	1802	0.53	5.3	-24.2	OR
1125	0.100	13.35	49	19.3	6.47	1805	0.46	4.6	-24.1	OR
1130	0.100	13.49	49	19.2	6.48	1809	0.44	4.4	-23.4	OR
1135	0.100	13.63	49	19.1	6.48	1816	0.40	4.0	-22.7	OR
1140	0.100	13.76	49	19.0	6.47	1821	0.38	3.8	-22.1	OR
1145	0.100	13.89	49	19.0	6.48	1824	0.38	3.8	-22.0	OR

6/18/20 JM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1150	0.100	13.99	49	19.1	6.48	1826	0.37	3.7	-21.9	OR

Additional Purge/Sample Data

Total Volume Purged (gal):	~1	Ambient Air Temperature (°F):	80 °F
Sample Time (CT):	1150	Pump Duration (mins) - i.e., total time pump ran during sample collection	130
Color/ Odor	TRANSLUCENT		
Final DTW (ft BTOC):	15.21	Final Turbidity:	20.4
Filter Type and Size:	0.45	Pump Used:	MP50: 033213 PUMP: 8288

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/18/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60621225.01 [redacted]
Groundwater Sampling Form (GWSF) Date: 6/18/20 Sheet 2 of 2

Well ID: GAF-440V

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 6/1 JM

Pump Settings (ID & psi or mV): ID:103 PSI:30 6/1 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 6/18 JM

Sample ID: GAF-GW-440V-06182020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1155

Time (CT) last sample bottle placed on ice: 1405

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF_DRE_20200618_JLM 6/18 JM

General Comments/Observations: 6/18/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/18/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]60621225.01
Groundwater Sampling Form (GWSF) Date: 6/17/20 Sheet 1 of 2

Well ID:	GAF-441V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	43 to 53	Initial Depth to Water (ft BTOC):	13.23	Total Depth (ft BTOC):	53
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1048

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1050	0.100	13.23	48	22.5	2.94	7076	1.34	13.4	355.1	178
1055	0.100	13.69	48	21.9	3.07	7113	0.64	6.4	33.6	326
1100	0.100	14.08	48	21.7	3.08	7118	0.54	5.4	77.1	505
1105	0.100	14.51	48	21.4	3.09	7124	0.48	4.8	107.2	521
1110	0.100	14.90	48	21.1	3.10	7130	0.33	3.3	324.9	572
1115	0.100	15.31	48	21.0	3.11	7133	0.30	3.0	329.2	594
1120	0.100	15.72	48	21.0	3.09	7136	0.28	2.8	336.3	687
1125	0.100	16.07	48	21.0	3.08	7139	0.27	27	339.1	712
1130	0.100	16.49	48	20.9	3.07	7145	0.25	2.5	342.3	654
1135	0.100	16.90	48	20.9	3.05	7147	0.24	2.4	344.9	571
1140	0.100	17.31	48	20.9	3.03	7149	0.22	2.2	346.2	529
1145	0.100	17.72	48	20.8	3.02	7156	0.21	0.21	348.9	462
1150	0.100	18.08	48	20.8	3.02	7155	0.20	0.20	350.1	412
1155	0.100	18.51	48	20.8	3.04	7152	0.19	1.9	347.1	387
1200	0.100	18.96	48	20.6	3.05	7140	0.19	1.9	344.3	421
1205	0.100	19.29	48	20.9	3.03	7142	0.17	1.7	343.1	459
1210	0.100	19.60	48	21.0	3.08	7134	0.17	1.7	340.8	482
1215	0.100	19.81	48	20.9	3.12	7136	0.17	1.7	338.2	521
1220	0.100	20.01	48	20.8	3.14	7137	0.16	1.6	336.9	471
1225	0.100	20.09	48	20.7	3.17	7138	0.16	1.6	335.2	419
1230	0.100	20.15	48	20.7	3.18	7138	0.16	1.6	334.7	431
1235	0.100	20.20	48	20.7	3.19	7128	0.15	1.5	331.6	482
1240	0.100	20.24	48	20.7	3.21	7119	0.15	1.5	329.8	491
1245	0.100	20.27	48	20.6	3.24	7109	0.15	1.5	328.2	446
Sample Readings										
1250	0.100	20.29	48	20.6	3.25	7103	0.14	1.4	326.8	570
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~5 gal	Ambient Air Temperature (°F):	80 °F
Sample Time (CT):	1250	Pump Duration (mins) - i.e., total time pump ran during sample collection	3hr 10min
Color/ Odor	TRANSLUCENT		
Final DTW (ft BTOC):	22.61	Final Turbidity:	322
Filter Type and Size:	0.45	Pump Used:	MP50: 033213 PUMP: 8288

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/17/20
Reviewed by: _____ Signature: _____ Date: _____

60621225.01

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]

Groundwater Sampling Form (GWSF) Date: 6/17/20 Sheet 2 of 2

Well ID: GAF-541U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 6/17 JM

Pump Settings (ID & psi or mV): ID:98 PSI:35 6/17 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 6/17 JM

Sample ID: GAF-GW-541U-06172020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1255

Time (CT) last sample bottle placed on ice: 1605

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF_DRE_20200617_JLM 6/17 JM

General Comments/Observations: GAF-AQ-900A-06172020 COLLECTED AT 1545. GAF-AQ-901A-06172020 COLLECTED AT 1550. USING DI WATER SUPPLIED BY TA ON 6/12/20 6/17 JM

6/17 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/17/20

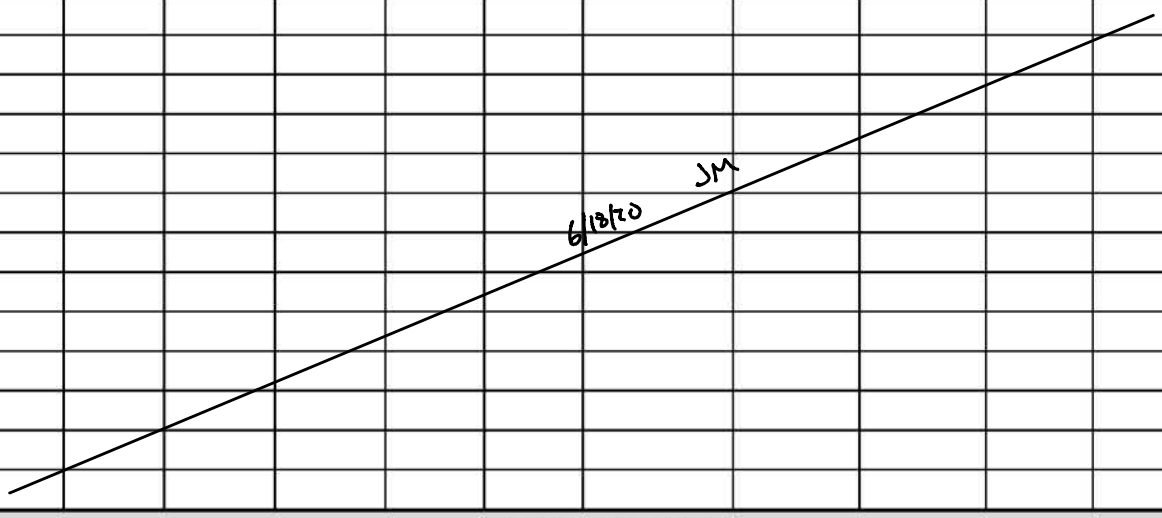
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60621225.01
Groundwater Sampling Form (GWSF) Date: 6/18/20 Sheet 1 of 2

Well ID:	GAF-44ZU	Well Diameter (in):	2	Screen Inteval (ft BTOC):	62 to 72	Initial Depth to Water (ft BTOC):	42.10	Total Depth (ft BTOC):	72
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0738

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0740	0.100	42.10	67	19.7	7.28	2560	2.98	29.8	-44.9	OR
0745	0.100	42.88	67	19.0	6.75	2524	1.19	11.9	-54.4	OR
0750	0.100	43.62	67	18.9	6.55	2520	0.86	8.6	-59.9	OR
0755	0.100	44.42	67	18.8	6.42	2517	0.68	6.8	-61.2	OR
0800	0.100	45.21	67	18.8	6.38	2512	0.51	5.1	-65.0	232
0805	0.100	46.01	67	18.7	6.36	2504	0.43	4.3	-65.8	112
0810	0.100	46.81	67	18.6	6.33	2496	0.38	3.8	-66.2	95.6
0815	0.100	47.62	67	18.5	6.30	2489	0.35	3.5	-66.8	33.3
0820	0.100	48.41	67	18.6	6.30	2488	0.37	3.7	-67.1	23.1
0825	0.100	49.23	67	18.6	6.30	2487	0.34	3.4	-67.5	21.2
0830	0.100	49.98	67	18.5	6.30	2487	0.34	3.4	-68.2	22.9



Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0835	0.100	50.77	67	18.5	6.30	2487	0.34	3.4	-69.3	23.6

Additional Purge/Sample Data

Total Volume Purged (gal):	21.5 gal			Ambient Air Temperature (°F):	70 °F		
Sample Time (CT):	0835	Pump Duration (mins) - i.e., total time pump ran during sample collection	120			Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	58.35	Final Turbidity:	23.2	Filter Type and Size:	0.45	Pump Used:	MP50: 033213 PUMP: 8288

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/18/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60621225.01
Groundwater Sampling Form (GWSF) Date: 6/18/20 Sheet 2 of 2

Well ID: GAF-442U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 6/18 JM

Pump Settings (ID & psi or mV): ID:103 PSI:35 6/18 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 6/18 JM

Sample ID: GAF-GW-442U-06182020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0840

Time (CT) last sample bottle placed on ice: 1035

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF_DRE_20200618_JLM 6/18 JM

General Comments/Observations: 6/18/20 JM

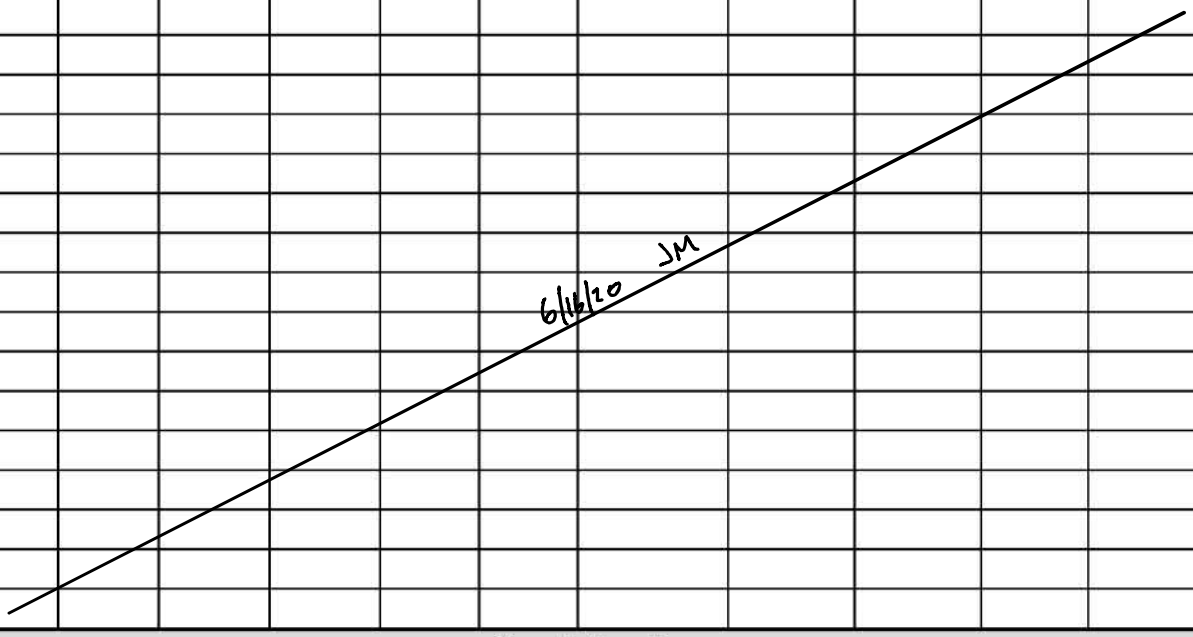
Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/18/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60621225.01
Groundwater Sampling Form (GWSF) Date: 6/16/20 Sheet 1 of 2

Well ID:	GAF-444 U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	53 to 63	Initial Depth to Water (ft BTOC):	36.42	Total Depth (ft BTOC):	63
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0759

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0800	0.150	36.42	58	20.8	9.30	2130	3.57	35.7	58.8	27.1
0805	0.150	36.93	58	18.5	4.66	2829	0.91	9.1	124.6	25.9
0810	0.100	37.42	58	18.6	4.53	2817	0.71	7.1	139.3	24.2
0815	0.100	38.56	58	18.7	4.42	2810	0.56	5.6	178.7	15.9
0820	0.100	39.11	58	18.8	4.42	27	0.45	4.5	182.1	11.6
0825	0.100	39.78	58	18.9	4.42	2794	0.39	3.9	186.3	10.7
0830	0.100	39.88	58	18.9	4.42	2790	0.34	3.4	191.2	10.3
0835	0.100	39.94	58	19.0	4.44	2791	0.32	3.2	190.7	9.69



Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0840	0.100	42.06	58	19.0	4.47	2792	0.30	3.0	190.2	10.2

Additional Purge/Sample Data

Total Volume Purged (gal):	~2.0	Ambient Air Temperature (°F):	70 °F
Sample Time (CT): 0840	Pump Duration (mins) - i.e., total time pump ran during sample collection: 5hr 30min	Color/Odor:	TRANSLUCENT
Final DTW (ft BTOC): 50.95	Final Turbidity: 7.92	Filter Type and Size: 0.45	Pump Used: MP50: 033213 PUMP: 8288

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/16/20
Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60621225.01
Groundwater Sampling Form (GWSF) Date: 6/16/20 Sheet 2 of 2

Well ID: GAF-444U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 6/16 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 30 6/16 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 6/16 JM

Sample ID: GAF-GW-444U-06162020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0845

Time (CT) last sample bottle placed on ice: 1415

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF_DRE_20200616 - JLM 6/16 JM

General Comments/Observations: 6/16/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/16/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 6·17·20 Sheet 1 of 2

Well ID:	GAF 447U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	11.6 to 16.6	Initial Depth to Water (ft BTOC):	6.52	Total Depth (ft BTOC):	16.6
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CH-(AECOM), Coleman Hill CH AECOM 6.17.20							Start Purge Time (CT):	0745

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0750	0.100	7.51	14	16.1	6.43	2670	0.44	4.5	37.2	>1000
0755	0.100	7.98	14	16.1	6.44	2655	0.58	6.0	37.6	149
0800	0.100	8.68	14	16.2	6.45	2608	0.41	4.2	38.0	92.2
0805	0.100	9.15	14	16.2	6.45	2567	0.35	3.8	35.3	67.7

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0805	0.100	9.15	14	16.2	6.45	2567	0.35	3.8	35.3	67.7

Additional Purge/Sample Data

Total Volume Purged (gal):	1	Ambient Air Temperature (°F):	73
Sample Time (CT):	0810	Pump Duration (mins) - i.e., total time pump ran during sample collection	100
Color/ Odor	Clear/NA		
Final DTW (ft BTOC):		Final Turbidity:	14.9
Filter Type and Size:	0.45 µm	Pump Used:	Bladder set 14' MP-50: 45877

Sampler Name: CHARLIE HOWARD Signature: Charles Howard Date: 6/17/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 6.17.20 Sheet 2 of 2

Well ID: GAF 447 U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 6.17.20 CH

Pump Settings (ID & psi or mV): #103 , 10 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 6.17.20 CH

Sample ID: GAF GW 447 U 06 17 2020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 0825 } All w/in 15 min

Time (CT) last sample bottle placed on ice: 0950 }

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 700 1725

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 3 ☑ Ra-226/Ra-228

4 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other

General Comments/Observations: 16 bottles filled: Metals & Ra have HNO_3 as preservative
Metals & Anions: 250 mL. TDS: 500mL. Ra: 1000 mL.

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 06.17.20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 6·17·20 Sheet 1 of 2

Well ID:	GAF 448U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	38 to 53	Initial Depth to Water (ft BTOC):	14.44	Total Depth (ft BTOC):	53
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CH-(AECOM), Coleman Hill CH AECOM 6.17.20							Start Purge Time (CT):	1225

Water Quality Observations										
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1230	0.100	13.87	45	21.4	6.69	1449	4.57	50.4	-59.3	58.7
1235	0.100	14.11	45	21.0	6.68	1461	4.84	52.1	-60.9	71.7
1240	0.100	14.91	45	20.9	6.66	1479	5.88	57.8	-61.8	84.8
1245	0.100	15.84	45	20.4	6.67	1494	6.33	59.2	-63.9	94.5
1250	0.100	16.77	45	20.6	6.69	1492	3.49	40.2	-62.2	91.2
1255	0.100	17.63	45	20.8	6.70	1495	1.89	19.3	-61.5	89.3
1300	0.100	18.44	45	20.8	6.71	1492	1.86	19.7	62.1	84.2
1310	0.100	18.96	45	20.8	6.72	1488	1.84	20.6	-60.7	78.6
1315	0.100	19.61	45	20.6	6.77	1452	1.51	16.1	-61.1	67.7
1320	0.100	20.65	45	20.4	6.79	1430	1.13	11.4	-63.9	59.5
1325	0.100	21.21	45	20.1	6.79	1426	1.11	12.4	63.4	44.4
1330	0.100	21.91	45	19.9	6.79	1423	1.22	14.1	-62.8	37.2
1335	0.100	22.2	45	20.0	6.80	1422	1.27	13.9	-62.2	37.0
1340	0.100	22.9	45	20.2	6.81	1421	1.40	13.2	-62.0	37.3
1345	0.100	23.5	45	20.4	6.81	1420	1.41	13.4	-61.8	37.5
1350	0.100	24.27	45	20.5	6.81	1419	1.43	13.6	-61.6	37.9
Sample Readings										
1350	0.100	24.27	45	20.5	6.81	1419	1.43	13.6	-61.6	37.9
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data								
Total Volume Purged (gal):	2.5			Ambient Air Temperature (°F):	79			
Sample Time (CT):	1350	Pump Duration (mins) - i.e., total time pump ran during sample collection			60	Color/ Odor	Clear/NA	
Final DTW (ft BTOC):	35.5	Final Turbidity:	36.8	Filter Type and Size:	0.45 µm	Pump Used:	Bladder set @ 45' MP-50: 45877	

Sampler Name: CHARLIE HOWARD Signature: Charles Howard Date: 6/17/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 6.17.20 Sheet 2 of 2

Well ID: GAF 448U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 6.17.20 CH

Pump Settings (ID & psi or mV): #103 , 30 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 6.17.20 CH

Sample ID: GAF GW 448U 06 17 2020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1405 } All w/in
Time (CT) last sample bottle placed on ice: 1455 } 15 min

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 700 1725

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 3 ☑ Ra-226/Ra-228

4 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other

General Comments/Observations: 16 bottles filled: Metals & Ra have HNO_3 as preservative
Metals & Anions: 250 mL. TDS: 500mL. Ra: 1000 mL.

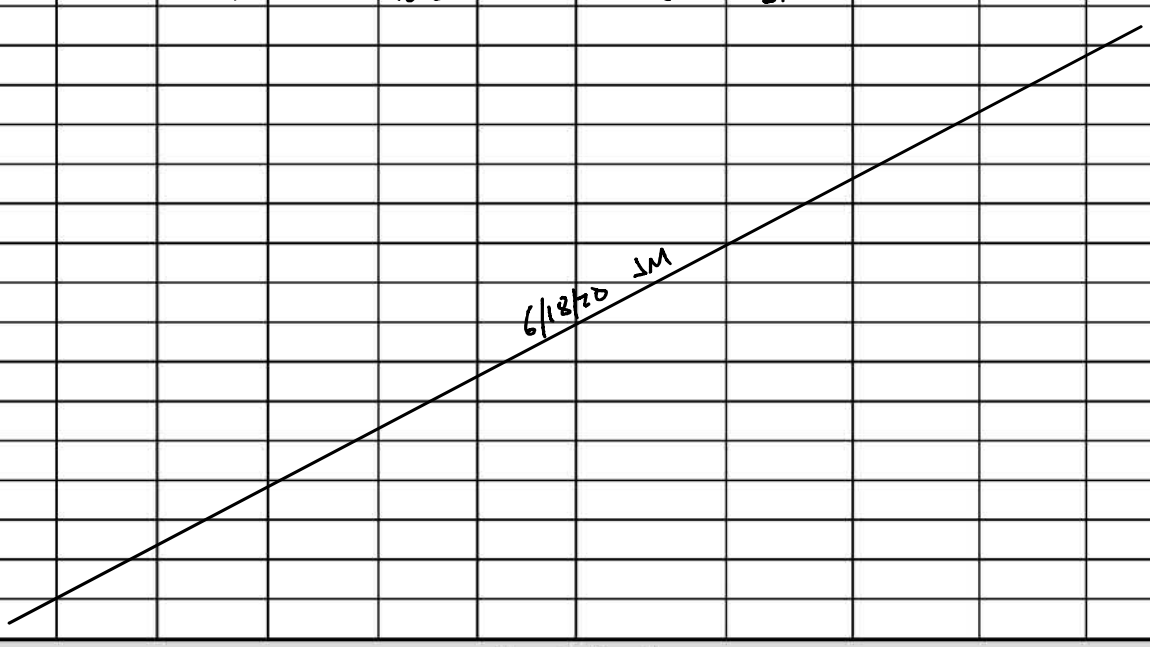
Sampler Name: Charlie Howard Signature: Charlie Howard Date: 06.17.20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]60621225.01
Groundwater Sampling Form (GWSF) Date: 6/18/20 Sheet 1 of 2

Well ID:	GAF-189V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	47 to 57	Initial Depth to Water (ft BTOC):	13.15	Total Depth (ft BTOC):	57
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1433

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or <5
1435	0.100	13.15	52	17.9	7.81	103.2	4.71	47.1	126.8	OR
1440	0.100	14.25	52	17.3	6.89	102.8	3.21	32.1	141.9	OR
1445	0.100	15.36	52	17.1	6.43	102.2	2.24	22.4	170.6	OR
1450	0.100	16.47	52	16.9	6.11	101.3	2.19	21.9	181.2	29.2
1455	0.100	17.61	52	16.7	5.92	100.4	2.16	21.6	193.8	87.3
1500	0.100	18.81	52	16.8	5.78	80.3	3.78	37.8	202.3	52.1
1505	0.100	19.92	52	16.8	5.70	76.4	3.62	36.2	209.4	44.1
1510	0.100	20.87	52	16.8	5.72	72.3	3.51	35.1	213.6	42.3



Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1515	0.100	21.99	52	16.7	5.56	64.2	4.66	47.5	219.6	43.6

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.5			Ambient Air Temperature (°F):	80 °F		
Sample Time (CT):	1515	Pump Duration (mins) - i.e., total time pump ran during sample collection		85	Color/ Odor	TRANSLUCENT	
Final DTW (ft BTOC):	34.2	Final Turbidity:	31.3	Filter Type and Size:	0.45	Pump Used:	MP50: 033213 PUMP: 8288

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/18/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60621225.01
Groundwater Sampling Form (GWSF) Date: 6/18/20 Sheet 2 of 2

Well ID: GAF-489U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 6/18 JM

Pump Settings (ID & psi or mV): ID:103 PSI:30 6/18 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 6/18 JM

Sample ID: GAF-GW-489U-06182020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1520

Time (CT) last sample bottle placed on ice: 1640

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF-DRE-20200618 - JLM 6/18 JM

General Comments/Observations: GAF-AQ-900A-06182020 AT 1530 AND GAF-AQ-901B-06182020 COLLECTED AT 1540 USING DI WATER SUPPLIED BY TA ON 6/12/20 6/18 JM

6/18 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/18/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477
Groundwater Sampling Form (GWSF) Date: 6/19/20 Sheet 1 of 2

Well ID:	GAF-450L	Well Diameter (in):	2	Screen Inteval (ft BTOC):	75.5 to 95.5	Initial Depth to Water (ft BTOC):	15.95	Total Depth (ft BTOC):	95.5
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1012

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1015	0.100	15.95	85	22.4	7.34	903	2.73	27.3	-48.9	37.2
1020	0.100	16.03	85	20.6	6.92	972	0.94	9.4	-79.0	27.2
1025	0.100	16.10	85	20.5	6.90	974	0.85	8.5	-80.6	18.9
1030	0.100	16.16	85	20.5	6.88	976	0.74	7.4	-82.2	9.12
1035	0.100	16.23	85	20.5	6.86	978	0.63	6.3	-83.1	6.34
1040	0.100	16.30	85	20.2	6.86	981	0.54	5.4	-84.1	4.82
1045	0.100	16.36	85	20.2	6.86	983	0.46	4.6	-85.0	3.21
1050	0.100	16.44	85	20.1	6.87	982	0.44	4.4	-86.2	3.59
1055	0.100	16.51	85	20.1	6.87	980	0.43	4.3	-87.1	3.45
1100	0.100	16.58	85	20.3	6.89	980	0.39	3.9	-88.5	3.21
1105	0.100	16.65	85	20.3	6.91	981	0.36	3.6	-89.6	3.09
1110	0.100	16.72	85	20.3	6.91	980	0.34	3.4	-89.8	7.85
1115	0.100	16.80	85	20.3	6.91	979	0.33	3.3	-90.0	3.31
1120	0.100	16.86	85	20.3	6.91	978	0.32	3.2	-90.3	3.72
1125	0.100	16.92	85	20.3	6.91	978	0.31	3.1	-90.6	3.54
1130	0.100	16.99	85	20.3	6.91	978	0.31	3.1	-90.9	3.64
1135	0.100	17.06	85	20.3	6.92	978	0.29	2.9	-91.4	3.78
1140	0.100	17.11	85	20.4	6.92	978	0.27	2.7	-91.9	3.82
1145	0.100	17.16	85	20.4	6.93	978	0.26	2.6	-92.3	3.41
1150	0.100	17.22	85	20.4	6.94	978	0.25	2.5	-92.6	3.52
1155	0.100	17.27	85	20.4	6.95	978	0.21	2.1	-93.2	3.60
1200	0.100	17.32	85	20.3	6.96	978	0.20	2.0	-94.0	3.46
1205	0.100	17.37	85	20.3	6.96	977	0.19	1.9	-94.6	3.41
1210	0.100	17.42	85	20.3	6.98	977	0.15	1.5	-95.2	3.52
Sample Readings										
1215	0.100	17.47	85	20.3	6.98	977	0.13	1.3	-96.1	3.64
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~3 gal	Ambient Air Temperature (°F):	70 °F		
Sample Time (CT):	1215	Pump Duration (mins) - i.e., total time pump ran during sample collection	10	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	17.61	Final Turbidity:	3.41	Filter Type and Size:	0.45	Pump Used:	MP50: 033213 PUMP: 8288

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/19/20
Reviewed by: Signature: Date:

60627477

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]

Groundwater Sampling Form (GWSF) Date: 6/19/20 Sheet 2 of 2

Well ID: GAF-450L

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 6/1 JM

Pump Settings (ID & psi or mV): ID:100 PSI:45 6/1 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 6/19 JM

Sample ID: GAF-GW-450L-06192020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1220

Time (CT) last sample bottle placed on ice: 1230

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF_DRE_20200619_JLM 6/19 JM

General Comments/Observations: GAFAQ-900A-06192020 COLLECTED AT 1225 AND GAF-AQ-901A-06192020 COLLECTED AT 1230 USING DI WATER SUPPLIED BY TA ON 6/18/20 6/19 JM

6/19 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/19/20

Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 6·18·20 Sheet 1 of 2

Well ID:	GAF 526U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	63 to 68	Initial Depth to Water (ft BTOC):	21.53	Total Depth (ft BTOC):	68
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CH-(AECOM), Coleman Hill CH AECOM 6.18.20							Start Purge Time (CT):	1205

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1210	0.100	21.18	65	20.9	5.77	1681	2.38	26.7	171.4	36.7
1215	0.100	21.91	65	19.3	6.31	1531	4.44	46.0	161.3	21.2
1220	0.100	22.27	65	18.2	6.61	1375	6.77	72.1	157.4	11.5
1225	0.100	22.92	65	18.2	6.71	1371	7.65	81.6	154.5	7.68
1230	0.100	23.21	65	18.3	6.73	1372	6.41	68.8	150.1	6.21
1235	0.100	23.59	65	18.3	6.78	1374	4.42	< .1	144.1	4.91
1240	0.100	23.70	65	18.5	6.80	1377	4.12	42.5	138.4	4.38
1245	0.100	23.92	65	18.4	6.81	1398	3.89	41.9	121.4	4.46
1300	0.100	24.05	65	18.4	6.81	1431	3.74	40.0	103.5	4.78

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1300	0.100	24.05	65	18.4	6.81	1431	3.74	40.0	103.5	4.78

Additional Purge/Sample Data

Total Volume Purged (gal):	1.5			Ambient Air Temperature (°F):	79		
Sample Time (CT):	1300	Pump Duration (mins) - i.e., total time pump ran during sample collection	110			Color/ Odor	Clear/NA
Final DTW (ft BTOC):	25.20	Final Turbidity:	9.49	Filter Type and Size:	0.45 µm	Pump Used:	Bladder Sete 65' MP-50: 45877

Sampler Name: CHARLIE HOWARD Signature: Date: 6/18/20

Reviewed by: SARA MEISSNER Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 6.18.20 Sheet 2 of 2

Well ID: GAF526U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 6.18.20 CH

Pump Settings (ID & psi or mV): #103 , 35 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 6.18.20 CH

Sample ID: GAFGW526U 06182020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1315 } All w/in 15 min

Time (CT) last sample bottle placed on ice: 1450 }

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 700 1725

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 3 ☑ Ra-226/Ra-228

4 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other

General Comments/Observations: 16 bottles filled: Metals & Ra have HNO_3 as preservative
Metals & Anions: 250 mL. TDS: 500mL. Ra: 1000 mL.

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 06.18.20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60621225.01
Groundwater Sampling Form (GWSF) Date: 6/17/20 Sheet 1 of 2

Well ID:	GAF-541V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	58 to 63	Initial Depth to Water (ft BTOC):	13.20	Total Depth (ft BTOC):	63
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0749

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or <5
0750	0.100	13.20	60.5	19.0	8.78	3021	3.56	35.6	-28.4	27.6
0755	0.100	13.81	60.5	18.5	6.46	3660	1.18	11.8	-34.3	21.2
0800	0.100	14.52	60.5	18.7	6.29	3715	0.68	6.8	-28.1	17.9
0805	0.100	15.09	60.5	18.7	6.11	3788	0.51	5.1	-22.4	16.2
0810	0.100	15.71	60.5	18.7	6.09	3798	0.45	4.5	-23.0	15.4
0815	0.100	16.41	60.5	18.8	6.09	3802	0.42	4.2	-22.4	15.8
0820	0.100	16.97	60.5	18.8	6.10	3784	0.36	3.6	-26.1	15.5
0825	0.100	17.56	60.5	18.9	6.10	3780	0.34	3.4	-28.1	15.3
0830	0.100	18.21	60.5	18.9	6.10	3777	0.33	3.3	-30.8	15.1
0835	0.100	18.88	60.5	19.0	6.11	3770	0.32	3.2	-37.2	16.7

6/17/20 JM

Sample Readings

0840	0.100	19.42	60.5	19.0	6.12	3765	0.31	3.1	-43.6	17.9

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~2 gal	Ambient Air Temperature (°F):	75 °F		
Sample Time (CT):	0840	Pump Duration (mins) - i.e., total time pump ran during sample collection	120	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	36.90	Final Turbidity: 106	Filter Type and Size: 0.45	Pump Used:	MP50: 033213 PUMP: 8288

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/17/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60621225.01
Groundwater Sampling Form (GWSF) Date: 6/17/20 Sheet 2 of 2

Well ID: GAF-541V

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 6/17 JM

Pump Settings (ID & psi or mV): ID:98 PSI:40 6/17 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 6/17 JM

Sample ID: GAF-GW-541V-06172020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0845

Time (CT) last sample bottle placed on ice: 1040

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PWE ENV.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☐ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other REFER TO GAF_DRE_20200617_JM 6/17 JM

General Comments/Observations: 6/17/20

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/17/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 6·18·20 Sheet 1 of 2

Well ID:	GAF S3	Well Diameter (in):	2	Screen Inteval (ft BTOC):	51 to 61	Initial Depth to Water (ft BTOC):	26.72	Total Depth (ft BTOC):	61
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CSH-(AECOM), Coleman Hill CH AECOM 6.18.20							Start Purge Time (CT):	0725

Water Quality Observations										
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0730	0.160	27.25	56	17.1	3.98	2373	1.02	10.7	238.7	163
0735	0.160	27.28	56	16.9	3.73	2568	0.54	5.5	245.2	114
0740	0.160	27.33	56	16.9	3.71	2551	0.54	5.6	248.8	79.1
0745	0.160	27.37	56	16.8	3.71	2544	0.55	5.7	253.0	59.3
0750	0.140	27.41	56	16.8	3.70	2498	0.49	5.3	255.3	41.1
0755	0.140	27.44	56	16.9	3.69	2464	0.46	4.8	260.3	31.8
0800	0.140	27.38	56	17.1	3.69	2454	0.43	4.5	261.1	27.0
0805	0.140	27.38	56	17.1	3.69	2464	0.40	4.2	262.1	22.3
0810	0.140	27.36	56	17.1	3.69	2477	0.39	4.0	264.9	18.8
0815	0.140	27.34	56	17.1	3.69	2489	0.33	3.4	267.9	16.0
0820	0.140	27.35	56	17.1	3.69	2491	0.30	3.0	268.1	14.4
0825	0.140	27.37	56	17.1	3.69	2506	0.29	3.1	269.8	11.8
0830	0.140	27.38	56	17.1	3.69	2514	0.27	2.8	269.9	10.1
0835	0.140	27.37	56	17.1	3.69	2520	0.26	2.7	271.1	9.6
0840	0.140	27.37	56	17.1	3.70	2528	0.23	2.4	271.9	8.4
0845	0.140	27.37	56	17.1	3.70	2534	0.21	2.2	272.4	7.60
0850	0.140	27.38	56	17.1	3.70	2539	0.20	2.1	272.7	7.51
0855	0.140	27.41	56	17.2	3.70	2541	0.20	2.0	273.1	7.49
0900	0.140	27.40	56	17.2	3.70	2543	0.19	1.9	273.3	7.44

Sample Readings										
0900	0.140	27.40	56	17.2	3.70	2543	0.19	1.9	273.3	7.44
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data									
Total Volume Purged (gal):	3.5			Ambient Air Temperature (°F):	77				
Sample Time (CT):	0900	Pump Duration (mins) - i.e., total time pump ran during sample collection		165		Color/ Odor	Clear/NA		
Final DTW (ft BTOC):	27.42	Final Turbidity:	11.1	Filter Type and Size:	0.45 µm		Pump Used:	Bladder Set e56' MP-50: 45877	

Sampler Name: CHARLIE HOWARD Signature: Date: 6/18/20

Reviewed by: SARA MEISSNER Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 6.18.20 Sheet 2 of 2

Well ID: GAF S3

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 6.18.20 CH

Pump Settings (ID & psi or mV): #102 135 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 6.18.20 CH

Sample ID: GAF GW S3 06182020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 0915 } All w/in 15 min

Time (CT) last sample bottle placed on ice: 1145 }

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 700 1725

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 3 ☑ Ra-226/Ra-228

4 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other

General Comments/Observations: 16 bottles filled: Metals & Ra have HNO_3 as preservative
Metals & Anions: 250 mL. TDS: 500mL. Ra: 1000 mL.

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 06.18.20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 7/14/20 Sheet 1 of 2

Well ID:	GAF-19R	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42 to 52	Initial Depth to Water (ft BTOC):	28.55	Total Depth (ft BTOC):	52
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOWARI /CH/ AECOM/SAMPLING SETUP							Start Purge Time (CT):	0725

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or <5
0730	0.240	28.55	47	16.7	3.29	3260	2.72	27.2	408.8	1.21
0735	0.240	29.41	47	16.6	3.75	3281	1.62	16.2	329.2	22.4
0740	0.240	29.65	47	16.6	3.99	3130	1.04	10.4	278.6	29.8
0745	0.240	29.68	47	16.5	4.02	3151	0.98	9.8	269.2	31.9
0750	0.240	29.70	47	16.5	4.04	3182	0.93	9.3	263.7	25.3
0755	0.240	29.72	47	16.7	4.05	3201	1.01	10.1	259.2	21.6
0800	0.240	29.74	47	16.8	4.06	3215	1.13	11.3	252.3	15.2
0805	0.240	29.75	47	16.8	4.07	3225	1.27	12.7	247.4	13.9
0810	0.240	29.76	47	16.7	4.07	3227	0.98	9.8	245.2	12.2
0815	0.240	29.77	47	16.7	4.08	3230	0.89	8.9	243.2	11.7
0820	0.240	29.78	47	16.7	4.08	3237	0.77	7.7	241.3	11.1
0825	0.240	29.79	47	16.7	4.08	3245	0.80	8.0	240.1	10.0
0830	0.240	29.79	47	16.7	4.09	3250	0.83	8.3	238.9	9.23
0835	0.240	29.80	74	16.7	4.09	3258	0.90	9.0	237.4	8.61
0840	0.240	29.80	74	16.8	4.09	3252	0.95	9.5	236.2	6.21
0845	0.240	29.81	74	16.8	4.09	3246	0.98	9.8	235.7	6.35
0850	0.240	29.81	74	16.8	4.10	3244	1.17	11.7	235.1	5.59
0855	0.240	29.81	74	16.8	4.10	3242	1.21	12.1	234.6	6.12
0900	0.240	29.82	74	16.8	4.10	3236	1.20	12.0	234.1	7.35
0905	0.240	29.82	74	16.8	4.11	3238	1.24	12.4	233.0	6.63
0910	0.240	29.82	74	16.8	4.11	3234	1.32	13.2	232.9	6.32
0915	0.240	29.83	74	16.9	4.11	3239	1.21	12.1	232.1	5.57
0920	0.240	29.83	74	16.9	4.12	3241	1.17	11.7	231.9	5.26
0925	0.240	29.83	74	16.9	4.12	3249	1.13	11.3	231.7	6.11
Sample Readings										
0930	0.240	29.83	74	16.9	4.12	3244	1.16	11.0	231.0	5.82
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~5gal	Ambient Air Temperature (°F):	78		
Sample Time (CT):	0930	Pump Duration (mins) - i.e., total time pump ran during sample collection	2hr 35min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	29.86	Final Turbidity:	6.31	Filter Type and Size:	0.45	Pump Used:	MP50: 033213 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/14/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 7/14/20 Sheet 2 of 2

Well ID: GAF-19R

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 7/14 JM

Pump Settings (ID & psi or mV): ID:103 PSI:25 7/14 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 7/14 JM

Sample ID: GAF-GW-19R -07142020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☒ Yes ☐ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0935

Time (CT) last sample bottle placed on ice: 1205

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☐ Other REFER TO GAF_DRE_20200714 - JLM 7/14 JM

General Comments/Observations: 7/14/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/14/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]60627477.02
Groundwater Sampling Form (GWSF) Date: 7/15/20 Sheet 1 of 2

Well ID:	GAF-20	Well Diameter (in):	2	Screen Inteval (ft BTOC):	45 to 55	Initial Depth to Water (ft BTOC):	25.95	Total Depth (ft BTOC):	55
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOMARI/CH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0938

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0940	0.100	25.95	50	19.9	7.15	1724	2.75	27.5	21.3	8.86
0945	0.100	26.20	50	19.1	7.03	1684	0.91	9.1	-8.1	9.21
0950	0.100	26.24	50	19.1	7.04	1678	0.78	7.8	-17.6	8.61
0955	0.100	26.25	50	19.1	7.04	1674	0.62	6.2	-23.1	8.44
1000	0.100	26.25	50	19.1	7.02	1678	0.56	5.6	-25.2	8.21
1005	0.100	26.25	50	19.2	7.00	1682	0.48	4.8	-26.3	7.98
1010	0.100	26.25	50	19.3	6.98	1688	0.45	4.5	-28.1	7.52
1015	0.100	26.25	50	19.4	6.96	1695	0.38	3.8	-29.7	7.12
1020	0.100	26.25	50	19.5	6.96	1699	0.34	3.4	-30.1	6.88
1025	0.100	26.25	50	19.6	6.95	1706	0.31	3.1	-31.2	6.41
1030	0.100	26.25	50	19.6	6.95	1711	0.30	3.0	-31.8	6.10
1035	0.100	26.25	50	19.7	6.94	1719	0.29	2.9	-32.6	5.88
1040	0.100	26.25	50	19.8	7.04	1722	0.27	2.7	-38.7	4.61
1045	0.100	26.25	50	19.8	7.14	1738	0.25	2.5	-32.8	3.22
					7/15 JM					

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1050	0.100	26.25	50	19.8	6.91	1742	0.24	2.4	-33.1	2.50

Additional Purge/Sample Data

Total Volume Purged (gal):	~2 gal	Ambient Air Temperature (°F):	85 °F		
Sample Time (CT):	1050	Pump Duration (mins) - i.e., total time pump ran during sample collection	1hr 30min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	30.84	Final Turbidity:	4.99	Filter Type and Size:	0.45	Pump Used:	MP50: 033213 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/15/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 7/15/20 Sheet 2 of 2

Well ID: GAF-20

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 7/15 JM

Pump Settings (ID & psi or mV): ID:100 PSI:25 7/15 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 7/15 JM

Sample ID: GAF-GW-20-07152020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1055

Time (CT) last sample bottle placed on ice: 1215

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☐ Other REFER TO GAF_DRE_20200715_JLM 7/15 JM

General Comments/Observations: 7/15/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/15/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.04

Groundwater Sampling Form (GWSF) Date: 7/15/20 Sheet 1 of 2

Well ID:	GAF-22	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42 to 52	Initial Depth to Water (ft BTOC):	26.95	Total Depth (ft BTOC):	52
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOWARD/CH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1303

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1305	0.100	26.95	47	28.9	8.26	422.2	7.67	76.7	47.1	6.49
1310	0.100	27.62	47	22.9	7.82	431.2	2.31	23.1	51.2	7.21
1315	0.100	28.41	47	21.1	7.65	441.0	1.07	10.7	55.5	11.3
1320	0.100	29.02	47	21.1	7.66	437.2	1.31	13.1	55.1	12.2
1325	0.100	29.63	47	21.0	7.67	431.3	1.54	15.4	54.7	11.4
1330	0.100	30.25	47	21.0	7.67	428.1	1.86	18.6	54.3	10.8
1335	0.100	30.81	47	21.1	7.65	426.5	1.88	18.8	53.2	6.31
1340	0.100	31.51	47	21.1	7.63	425.0	1.90	19.0	52.8	4.98
1345	0.100	32.06	47	21.1	7.68	424.7	1.92	19.2	54.7	3.46
1350	0.100	32.70	47	21.1	7.70	424.3	1.95	19.5	56.3	3.21

7/15 >M

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1355	0.100	33.29	47	21.1	7.73	424.1	1.98	19.8	58.4	2.10

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	95 °F		
Sample Time (CT):	1355	Pump Duration (mins) - i.e., total time pump ran during sample collection	1hr 20min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	36.72	Final Turbidity: 4.81	Filter Type and Size: 0.45	Pump Used:	MP50: 033213 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/15/20

Reviewed by: _____ Signature: _____ Date: _____

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]

Groundwater Sampling Form (GWSF) Date: 7/15/20 Sheet 2 of 2

Well ID: GAF-22

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 7/15 JM

Pump Settings (ID & psi or mV): ID:102 PSI:25 7/15 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 7/15 JM

Sample ID: GAF-GW-22-07152020

☒ Unfiltered ☐ Filtered ☐ Both

Filter ID: N/A

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1400

Time (CT) last sample bottle placed on ice: 1515

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☐ Other REFER TO GAF_DRE_20200715 - JLM 7/15 JM

General Comments/Observations: GAF-AQ-900--07152020 AT 1430 USING DI WATER SUPPLIED BY TA ON 6/12/20 7/15 JM 7/15 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/15/20

Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 7/14/20 Sheet 1 of 2

Well ID:	GAF-26	Well Diameter (in):	2	Screen Inteval (ft BTOC):	96 to 106	Initial Depth to Water (ft BTOC):	22.71	Total Depth (ft BTOC):	106
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOWARD/CH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1230

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1230	0.140	22.71	101	21.7	7.70	1244	4.05	40.5	-154.7	19.7
1235	0.140	22.73	101	22.2	7.85	1212	3.65	36.5	-142.3	19.3
1240	0.140	22.73	101	22.6	7.96	1160	3.21	32.1	-118.2	18.8
1245	0.140	22.73	101	23.3	8.06	1123	2.82	28.2	-92.5	18.5
1250	0.140	22.73	101	23.4	8.12	1042	2.43	24.3	-65.9	18.2
1255	0.140	22.73	101	23.5	8.13	1019	2.21	22.1	-42.1	16.7
1300	0.140	22.73	101	23.5	8.13	1000	2.14	21.4	-29.5	17.2
1305	0.140	22.73	101	22.9	8.43	999.6	1.77	17.7	-56.6	16.1
1310	0.140	22.73	101	21.9	8.19	999.7	1.69	16.9	-57.8	15.5
1315	0.140	22.73	101	21.5	7.81	999.7	1.62	16.2	-58.7	15.2
1320	0.140	22.73	101	21.6	7.74	999.6	1.52	15.2	-66.5	16.3
1325	0.140	22.73	101	21.4	7.74	999.6	1.31	13.1	-75.9	15.9
1330	0.140	22.73	101	21.3	7.74	999.6	1.25	12.5	-83.4	14.7
1335	0.140	22.73	101	21.7	7.76	999.7	1.20	12.0	-88.2	14.6
1340	0.140	22.73	101	21.9	7.71	999.6	1.16	11.6	-96.2	15.0
1345	0.140	22.73	101	22.1	7.66	999.6	1.12	11.2	-101.3	14.4
1350	0.140	22.73	101	22.3	7.64	999.5	1.07	10.7	-116.1	13.2
1355	0.140	22.73	101	22.7	7.62	999.5	1.02	10.2	-121.2	12.1
1400	0.140	22.73	101	22.9	7.61	999.4	0.95	9.5	-127.6	11.9
1405	0.140	22.73	101	23.0	7.59	999.4	0.91	9.1	-132.7	11.2
1410	0.140	22.73	101	23.1	7.58	999.4	0.88	8.8	-139.3	10.7
1415	0.140	22.73	101	23.2	7.57	999.3	0.86	8.6	-144.6	10.2
1420	0.140	22.73	101	23.2	7.57	999.3	0.84	8.4	-150.0	9.94
1425	0.140	22.73	101	23.3	7.57	999.2	0.82	8.2	-152.2	10.1

CHANGED YSI -> SENSOR

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1430	0.140	22.73	101	23.3	7.57	999.2	0.81	8.1	-165.4	9.77

Additional Purge/Sample Data

Total Volume Purged (gal):	~35 gal	Ambient Air Temperature (°F):	90°F		
Sample Time (CT):	1430	Pump Duration (mins) - i.e., total time pump ran during sample collection	2hr 15min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	22.73	Final Turbidity:	25.6	Filter Type and Size:	0.45	Pump Used:	MP50: 033213 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/14/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]

Groundwater Sampling Form (GWSF) Date: 7/14/20 Sheet 2 of 2

Well ID: GAF-26

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 7/14 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 40 7/14 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 7/14 JM

Sample ID: GAF-GW-26-07142020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☒ Yes ☐ No Field Duplicate ID: GAF-GW-902-07142020

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1435

Time (CT) last sample bottle placed on ice: 1645

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☐ Other REFER TO GAF_DRE_20200714 - JLM 7/14 JM

General Comments/Observations: GAF-AQ-900--07142020 AT 1300 AND GAF-AQ-901 -07142020 COLLECTED AT 1330 AND GAF-AQ-902 -07142020@1315 USING DI WATER SUPPLIED BY TA ON 6/12/20 7/14 JM

7/14 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/14/20

Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 7/14/20 Sheet 1 of 2

Well ID:	GAF-26	Well Diameter (in):	2	Screen Inteval (ft BTOC):	96 to 106	Initial Depth to Water (ft BTOC):	22.38	Total Depth (ft BTOC):	106
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOWARD/CH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0825

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0825	0.140	22.40	101	26.1	7.20	1536	5.87	58.7	-61.5	22.3
0830	0.140	22.40	101	25.4	7.19	1522	4.81	48.1	-78.6	18.7
0835	0.140	22.40	101	24.8	7.19	1496	4.49	44.9	-93.2	17.6
0840	0.140	22.40	101	24.2	7.13	1421	4.26	42.6	-91.2	19.2
0845	0.140	22.40	101	18.9	7.10	1345	3.91	39.1	-90.3	17.1
0850	0.140	22.40	101	18.6	7.08	1321	2.47	24.7	-84.4	16.9
0855	0.140	22.40	101	18.2	7.06	1287	2.36	23.6	-76.2	16.7
0900	0.140	22.40	101	18.3	7.02	1221	2.15	21.5	-73.6	16.1
0905	0.140	22.40	101	18.1	7.10	1142	1.80	18.0	-76.7	16.4
0910	0.140	22.40	101	18.1	7.11	1156	1.71	17.1	-81.2	15.2
0915	0.140	22.40	101	18.0	7.12	1172	1.60	16.0	-86.1	15.0
0920	0.140	22.40	101	18.0	7.12	1191	1.52	15.2	-89.9	14.6
0925	0.140	22.40	101	18.0	7.13	1206	1.46	14.6	-94.7	13.1
0930	0.140	22.40	101	18.0	7.13	1221	1.41	14.1	-92.9	11.2
0935	0.140	22.40	101	18.0	7.14	1239	1.36	13.6	-99.8	10.8
0940	0.140	22.40	101	18.0	7.14	1247	1.31	13.1	-104.7	9.61
0945	0.140	22.40	101	17.9	7.14	1256	1.26	12.6	-109.2	10.3
0950	0.140	22.40	101	17.9	7.15	1269	1.21	12.1	-114.7	8.41
0955	0.140	22.40	101	17.9	7.16	1274	1.17	11.7	-116.8	7.26
1000	0.140	22.40	101	18.0	7.15	1291	1.14	11.4	-119.8	6.18
1005	0.140	22.40	101	18.0	7.15	1302	1.10	11.0	-121.2	4.33
1010	0.140	22.40	101	17.9	7.14	1369	1.05	10.5	-123.7	7.06
1015	0.140	22.40	101	17.9	7.14	1315	1.00	10.0	-124.1	11.2
1020	0.140	22.40	101	18.0	7.13	1321	0.91	9.1	-120.2	21.2
Sample Readings										
1025	0.140	22.40	101	18.0	7.12	1329	0.87	8.7	-117.0	18.7
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~35 gal			Ambient Air Temperature (°F):	80°F		
Sample Time (CT):	1025	Pump Duration (mins) - i.e., total time pump ran during sample collection	3 hr 20 min			Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	22.41	Final Turbidity:	54.1	Filter Type and Size:	0.45	Pump Used:	MP50: 047291 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/14/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60627477.02 [redacted]
Groundwater Sampling Form (GWSF) Date: 7/24/20 Sheet 2 of 2

Well ID: GAF-26

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 7/24 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 40 7/24 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 7/24 JM

Sample ID: GAF-GW-26-07242020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☒ Yes ☐ No

Field duplicate collected? ☒ Yes ☐ No Field Duplicate ID: GAF-GW-902-07242020

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1030

Time (CT) last sample bottle placed on ice: 1345

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☐ Other REFER TO GAF_DRE_20200724_JLM 7/24 JM

General Comments/Observations: GAF-AQ-900--07242020 AT 1230 AND GAF-AQ-901 -07242020 COLLECTED AT 1245 AND GAF-AQ-902 -07242020@1345 USING DI WATER SUPPLIED BY TA ON 6/12/20 7/24 JM 7/24 JM

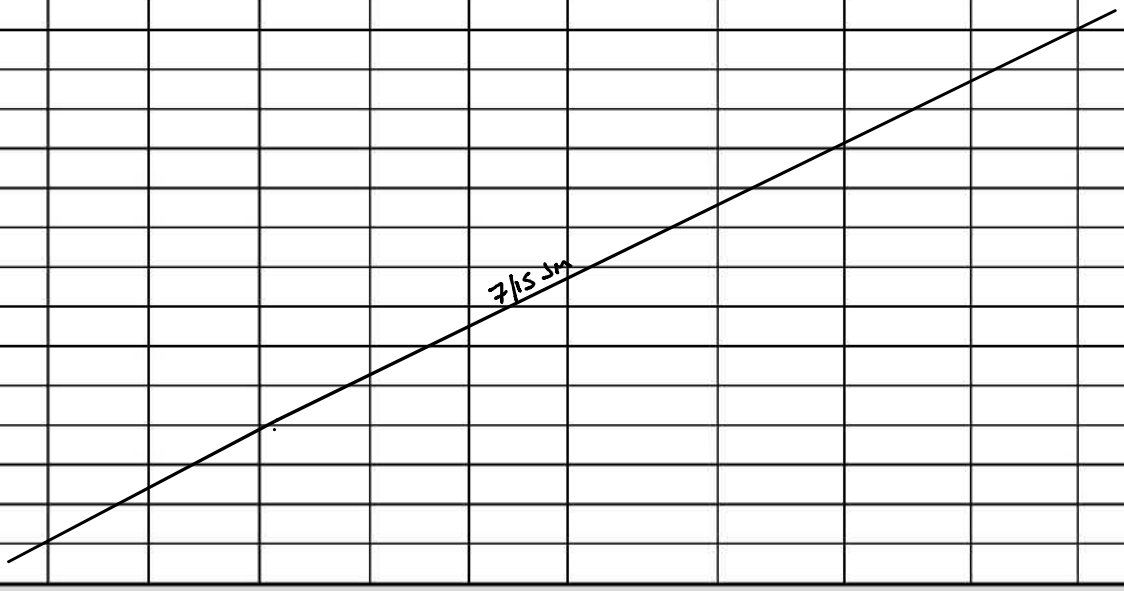
Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/24/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 7/15/20 Sheet 1 of 2

Well ID:	GAF-27	Well Diameter (in):	2	Screen Inteval (ft BTOC):	80 to 90	Initial Depth to Water (ft BTOC):	21.70	Total Depth (ft BTOC):	90
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK CHARLIE HOWARD/CH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0720

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0720	0.100	21.70	85	18.7	8.03	1769	2.37	23.7	108.1	2.21
0725	0.100	22.85	85	17.6	7.51	1877	0.95	9.5	-87.5	2.31
0730	0.100	24.31	85	17.5	7.33	1854	1.72	17.2	-51.3	2.52
0735	0.100	26.36	85	17.7	7.30	1841	0.95	9.5	-46.7	2.30
0740	0.100	26.85	85	17.9	7.26	1832	0.64	6.4	-42.1	2.12
0745	0.100	27.32	85	18.3	7.25	1836	0.50	5.0	-41.6	2.61
0750	0.100	27.95	85	18.4	7.24	1840	0.47	4.7	-41.2	2.78
0755	0.100	28.53	85	18.5	7.24	1838	0.44	4.4	-41.6	2.31
0800	0.100	29.02	85	18.6	7.25	1836	0.40	4.0	-41.9	1.88



Sample Readings

0805	0.100	29.66	85	18.7	7.26	1833	0.38	3.8	-41.6	1.72

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	80°F		
Sample Time (CT):	0805	Pump Duration (mins) - i.e., total time pump ran during sample collection	1hr 25min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	35.77	Final Turbidity: 3.21	Filter Type and Size: 0.45	Pump Used:	MP50: 033213 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/15/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 7/15/20 Sheet 2 of 2

Well ID: GAF-27

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 7/15 JM

Pump Settings (ID & psi or mV): ID:102 PSI:35 7/15 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 7/15 JM

Sample ID: GAF-GW-27 -07152020

☒ Unfiltered ☐ Filtered ☐ Both

Filter ID: N/A

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0810

Time (CT) last sample bottle placed on ice: 0930

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☐ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☐ Dissolved Ra-226/Ra-228 ☐ TOC ☐ Other REFER TO GAF_DRE_20200715_JLM 7/15 JM

General Comments/Observations: 7/15/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/15/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 8/17/20 Sheet 1 of 2

Well ID:	GAF-19R	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42 to 52	Initial Depth to Water (ft BTOC):	28.61	Total Depth (ft BTOC):	52
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/HO/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0928

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0930	0.240	29.42	47	17.3	2.09	3388	10.22	102.2	424.3	10.2
0935	0.240	29.43	47	16.9	3.41	3083	2.54	25.4	335.2	11.9
0940	0.240	29.44	47	17.0	2.49	3104	2.36	23.6	316.2	12.7
0945	0.240	29.44	47	17.1	2.38	3125	2.15	21.5	293.3	14.3
0950	0.240	29.44	47	17.1	2.54	3152	2.06	20.6	284.3	15.1
0955	0.240	29.44	47	17.1	2.79	3159	1.94	19.4	278.1	16.9
1000	0.240	29.44	47	17.2	2.83	3164	1.81	18.1	273.7	18.2
1005	0.240	29.44	47	17.2	2.87	3172	1.69	16.9	269.2	19.1
1010	0.240	29.44	47	17.3	3.01	3181	1.58	15.8	264.8	19.3
1015	0.240	29.44	47	17.3	3.06	3184	1.52	15.2	263.1	22.4
1020	0.240	29.44	47	17.4	3.08	3172	1.47	14.7	261.9	23.6
1025	0.240	29.44	47	17.4	3.11	3167	1.42	14.2	260.9	25.4
1030	0.240	29.44	47	17.5	3.15	3173	1.35	13.5	257.9	26.8
1035	0.240	29.44	74	17.6	3.41	3168	1.28	12.8	256.8	27.3
1040	0.240	29.44	74	17.6	3.45	3162	1.30	13.0	256.2	27.9
1045	0.240	29.44	74	17.5	3.51	3167	1.27	12.7	255.6	28.7
				8/17/20						

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1050	0.240	29.44	74	17.5	3.58	3164	1.32	13.2	255.0	29.2

Additional Purge/Sample Data

Total Volume Purged (gal):	~5gal			Ambient Air Temperature (°F):	84		
Sample Time (CT):	1050	Pump Duration (mins) - i.e., total time pump ran during sample collection	3 hr 55 min			Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	29.49	Final Turbidity:	32.6	Filter Type and Size:	0.45	Pump Used:	MP50:016249 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/17/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 8/17/20 Sheet 2 of 2

Well ID: GAF-19R

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 8/17 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 25 8/17 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 8/17 JM

Sample ID: GAF-GW-19R -08172020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☒ Yes ☐ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1055

Time (CT) last sample bottle placed on ice: 1445

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20200817_JLM 8/17 JM

General Comments/Observations: GAF-AQ-900A-08172020 AT 1315 AND GAF-AQ-901A-08172020 COLLECTED AT 1340 USING DI WATER SUPPLIED BY TA ON 4/7/20 8/17 JM

8/17 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/17/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 8/18/20 Sheet 1 of 2

Well ID:	GAF-19R	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42 to 52	Initial Depth to Water (ft BTOC):	28.65	Total Depth (ft BTOC):	52
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/HO/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0700

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0700	0.240	28.65	47	16.9	5.25	3112	1.85	18.5	350.6	11.2
0705	0.240	29.95	47	16.7	5.22	3058	0.97	9.7	337.4	12.6
0710	0.240	30.34	47	16.6	5.21	3058	0.48	4.8	321.2	15.7
0715	0.240	30.72	47	16.6	5.20	3058	0.44	4.4	306.8	16.2
0720	0.240	31.11	47	16.6	5.20	3074	0.32	3.2	297.6	17.6
0725	0.240	31.21	47	16.5	5.23	3116	0.47	4.7	271.2	18.1

8/18/20 JM

Sample Readings

0730	0.240	31.25	47	16.5	5 21	3139	0.31	3.1	262.9	19.3
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	84		
Sample Time (CT):	0730	Pump Duration (mins) - i.e., total time pump ran during sample collection	1 hr 2 min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	31.35	Final Turbidity: 34.6	Filter Type and Size: N/A	Pump Used:	MP50:016249 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/18/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 8/18/20 Sheet 2 of 2

Well ID: GAF-19R

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 8/18 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 25 8/18 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 8/18 JM

Sample ID: GAF-GW-19R -08182020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☒ Yes ☐ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0740

Time (CT) last sample bottle placed on ice: 0830

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☐ Dissolved Metals ☐ TSS ☐ TDS ☐ Anions ☐ General Chemistry ☐ Ra-226/Ra-228

☐ Dissolved Ra-226/Ra-228 ☐ TOC ☒ Other BULK SAMPLING 30 1 Liters 8/18 JM

General Comments/Observations: 8/18/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/18/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 8/17/20 Sheet 1 of 2

Well ID:	GAF20	Well Diameter (in):	2	Screen Inteval (ft BTOC):	45.0 to 55.0	Initial Depth to Water (ft BTOC):	25.50	Total Depth (ft BTOC):	55.0
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CH-(AECOM), Coleman Hill CH AECOM 8.17.20							Start Purge Time (CT):	1000

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1010	0.100	25.85	50	19.7	6.56	1719	1.54	17.0	180.3	6.64
1015	0.100	25.70	50	20.1	6.31	1704	0.75	8.2	131.4	2.76
1020	0.080	25.70	50	20.0	6.27	1706	0.67	7.5	115.7	2.41
1025	0.100	25.75	50	19.0	6.26	1709	0.61	6.6	105.3	2.53
1030	0.100	25.77	50	18.5	6.20	1706	0.48	5.1	100.3	2.98
1035	0.100	25.81	50	18.5	6.20	1711	0.36	3.8	91.4	1.53
1040	0.100	25.81	50	18.6	6.20	1711	0.32	3.6	86.4	1.92

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1040	0.100	25.81	50	18.6	6.20	1711	0.32	3.6	86.4	1.92

Additional Purge/Sample Data

Total Volume Purged (gal):	1.5	Ambient Air Temperature (°F):	82		
Sample Time (CT):	1040	Pump Duration (mins) - i.e., total time pump ran during sample collection	150	Color/ Odor	Clear / VA
Final DTW (ft BTOC):	25.86	Final Turbidity: 2.56	Filter Type and Size: 0.45 um	Pump Used:	Bladder (Dedicated) MP-50: 2101

Sampler Name: CHARLIE HOWARD Signature: [signature] Date: 8/17/20
Reviewed by: SARA MEISSNER Signature: [signature] Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 8.17.20 Sheet 2 of 2

Well ID: GAF 20

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 8.17.20 CH

Pump Settings (ID & psi or mV): #102, 27 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 8.17.20 CH

Sample ID: GAF GW 20 08172020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☑ Yes ☐ No Field Duplicate ID: GAF GW 903B 08172020

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1050
Time (CT) last sample bottle placed on ice: 1320
} All w/in 15 min

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☐ Yes ☑ No

If yes, Lot# NA

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 4 ☑ Ra-226/Ra-228

3 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, S^{2-}, TKN, NO_2/NO_3

2 Sets (Sample & Dup): 32 total bottles. Each set below:
General Comments/Observations: 1-500mL PO_4 (H_2SO_4 pres), 1-250mL S^{2-} F (Zn Acetate, NaOH pres), 2-1L TSS (No Pres), 1-500mL TDS
1-250mL Metals (HNO_3 pres), 1-250mL TKN (H_2SO_4 pres), 1-250mL NO_2/NO_3 (H_2SO_4 pres), 1-250mL anions/gen chem (no pres)
2-40mL VOA (H_2SO_4 pres), 2-1L Rad (HNO_3 pres), 1-250mL Diss Metals (HNO_3 pres), 2-1L Diss Rad HNO_3 pres)

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 08.17.20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 8/18/20 Sheet 1 of 2

Well ID:	GAF22	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42.0 to 52.0	Initial Depth to Water (ft BTOC):	26.70	Total Depth (ft BTOC):	520
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CSH-(AECOM), Coleman Hill CH AECOM 8.18.20							Start Purge Time (CT):	0720

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0725	0.100	26.82	47	19.1	7.10	440.5	1.54	16.6	219.8	2.47
0730	0.100	28.52	47	18.9	7.04	436.8	1.33	14.3	214.8	0.57
0735	0.100	29.51	47	19.0	7.05	433.3	1.61	17.1	212.2	0.91
0740	0.100	29.80	47	19.1	7.06	429.7	1.75	19.0	211.4	1.03
0745	0.100	30.3	47	19.1	7.07	427.9	1.91	20.3	210.1	0.92
0750	0.100	30.9	47	19.2	7.08	425.6	2.03	22.0	208.0	0.64
0755	0.100	31.72	47	19.2	7.09	423.2	2.18	23.4	204.8	0.83
0800	0.100	32.33	47	19.1	7.07	421.9	2.16	23.6	204.4	0.68

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0800	0.100	32.33	47	19.1	7.07	421.9	2.16	23.6	204.4	0.68

Additional Purge/Sample Data

Total Volume Purged (gal):	2	Ambient Air Temperature (°F):	72
Sample Time (CT):	0800	Pump Duration (mins) - i.e., total time pump ran during sample collection	90
Color/ Odor	Clear / NA		
Final DTW (ft BTOC):	38.22	Final Turbidity:	1.05
Filter Type and Size:	0.45 µm	Pump Used:	Bladder (Dedicated) MP-50: 2101

Sampler Name: CHARLIE HOWARD Signature: [signature] Date: 8/18/20

Reviewed by: SARA MEISSNER Signature: [signature] Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 8.18.20 Sheet 2 of 2

Well ID: GAF 22

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 8.18.20 CH

Pump Settings (ID & psi or mV): #102, 25 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 8.18.20 CH

Sample ID: GAF GW 22 08182020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 0810 } All w/in 15 min
Time (CT) last sample bottle placed on ice: 0940 }

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☐ Yes ☑ No

If yes, Lot# NA

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 4 ☑ Ra-226/Ra-228

3 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, S^{2-}, TKN, NO_2/NO_3

16 total bottles.

General Comments/Observations: 1-500mL PO_4 (H_2SO_4 pres), 1-250mL S^{2-} F (Zn Acetate, NaOH pres), 2-1L TSS (No Pres), 1-500mL TDS
1-250mL Metals (HNO_3 pres), 1-250mL TKN (H_2SO_4 pres), 1-250mL NO_2/NO_3 (H_2SO_4 pres), 1-250mL anions/gen chem (no pres)
2-40mL VOA (H_2SO_4 pres), 2-1L Rad (HNO_3 pres), 1-250mL Diss Metals (HNO_3 pres), 2-1L Diss Rad (HNO_3 pres)

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 08.18.20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 8/20/20 Sheet 1 of 2

Well ID:	GAF-439V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	32.5 to 37.5	Initial Depth to Water (ft BTOC):	5.99	Total Depth (ft BTOC):	37.5
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/HO/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0715

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or <5
0715	0.100	5.99	35	19.0	6.83	1534	3.56	35.6	68.4	48.3
0720	0.100	7.06	35	18.5	6.68	1810	2.91	30.0	-50.7	62.3
0725	0.100	7.52	35	18.1	6.67	1838	0.79	7.9	-60.4	68.1
0730	0.100	7.68	35	18.1	6.68	1838	0.67	6.7	-60.0	74.1
0735	0.100	7.71	35	18.0	6.68	1837	0.71	7.1	-59.3	78.9
0740	0.100	7.73	35	18.0	6.76	1837	0.69	6.9	-58.7	83.1
0745	0.100	7.75	35	18.0	6.86	1836	0.70	7.0	-58.1	86.7
0750	0.100	7.77	35	17.9	6.79	1837	0.68	6.8	-56.1	92.1
0755	0.100	7.79	35	17.8	6.68	1831	0.74	7.4	-55.3	96.4
0800	0.100	7.81	35	17.8	6.68	1834	0.73	7.3	-55.6	100
0805	0.100	7.83	35	17.8	6.67	1836	0.72	7.2	-54.7	102
0810	0.100	7.85	35	17.8	6.66	1835	0.78	7.8	-52.3	107
0815	0.100	7.86	35	17.8	6.66	1835	0.77	7.7	-51.4	111
0820	0.100	7.87	35	17.9	6.66	1837	0.76	7.6	-51.5	116
0825	0.100	7.88	35	17.9	6.66	1839	0.75	7.5	-51.6	118
				JM 8/20/20						

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0830	0.100	7.89	35	18.0	6.66	1840	0.77	7.7	-50.8	122

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal			Ambient Air Temperature (°F):	80		
Sample Time (CT):	0830	Pump Duration (mins) - i.e., total time pump ran during sample collection	1 hr 25 min			Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	8.32	Final Turbidity:	151	Filter Type and Size:	0.45	Pump Used:	MP50:016249 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/20/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 8/20/20 Sheet 2 of 2

Well ID: GAF-439U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 8/20 JM

Pump Settings (ID & psi or mV): ID: 99 PSI: 25 8/20 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 8/20 JM

Sample ID: GAF-GW-439U-08202020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0835

Time (CT) last sample bottle placed on ice: 1020

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PINE

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20200820_JLM 8/20 JM

General Comments/Observations: GAF-AQ-900-08202020 AT 0920 AND GAF-AQ-901-08202020 COLLECTED AT 0925 USING DI WATER SUPPLIED BY TA ON 4/7/20 8/20 JM
8/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/20/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 8/19/20 Sheet 1 of 2

Well ID:	GAF-490V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	44 to 54	Initial Depth to Water (ft BTOC):	13.95	Total Depth (ft BTOC):	54
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/HO/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0930

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0930	0.100	13.95	49	19.3	6.67	1687	4.75	47.5	-9.6	254
0935	0.100	14.21	49	19.3	6.68	1750	1.10	11.0	3.4	64
0940	0.100	14.40	49	19.4	6.72	1776	0.87	8.7	4.7	82
0945	0.100	14.62	49	19.5	6.74	1791	0.63	6.3	2.9	93
0950	0.100	14.83	49	19.6	6.76	1799	6.49	4.9	1.2	107
0955	0.100	15.03	49	19.6	6.78	1808	0.45	4.5	-0.6	128
1000	0.100	15.19	49	19.5	6.79	1820	0.41	4.1	-0.8	137
1005	0.100	15.35	49	19.4	6.80	1815	0.37	3.7	-0.7	132
1010	0.100	15.52	49	19.4	6.79	1817	0.35	3.5	0.1	126
1015	0.100	15.70	49	19.4	6.78	1820	0.34	3.4	0.5	131

8/19/20 JM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1020	0.100	15.86	49	19.3	6.77	1821	0.32	3.2	0.9	139

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	80		
Sample Time (CT):	1010	Pump Duration (mins) - i.e., total time pump ran during sample collection	2 hr 30 min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	16.01	Final Turbidity:	62.2	Filter Type and Size:	0.45	Pump Used:	MP50:016249 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/19/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 8/19/20 Sheet 2 of 2

Well ID: GAF-44DU

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 8/19 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 30 8/19 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 8/19 JM

Sample ID: GAF-GW-44DU-08192020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1025

Time (CT) last sample bottle placed on ice: 1250

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PACE

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20200819_JLM 8/19JM

General Comments/Observations: 8/19/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/19/20
Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 8/18/20 Sheet 1 of 2

Well ID:	GAF 441U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	43 to 53	Initial Depth to Water (ft BTOC):	15.32	Total Depth (ft BTOC):	53
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CSH-(AECOM), Coleman Hill CH AECOM 8.18.20							Start Purge Time (CT):	1005

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1015	0.100	15.52	48	21.5	3.15	6826	0.58	6.7	228.4	107
1020	0.100	15.91	48	21.2	3.01	6851	0.41	4.9	227.9	152
1025	0.100	16.80	48	21.1	2.92	6877	0.32	3.7	232.2	197
1030	0.100	17.33	48	21.1	2.91	6889	0.33	3.9	233.3	207
1035	0.100	17.88	48	21.1	2.89	6913	0.36	4.1	234.2	235
1040	0.100	18.37	48	21.0	2.87	6944	0.31	3.6	236.3	231
1045	0.100	1866	48	21.0	2.86	7004	0.29	3.4	240.1	229
1050	0.100	18.92	48	20.9	2.81	7021	0.27	3.1	246.2	226
1055	0.100	19.19	48	20.9	2.85	7075	0.20	2.3	244.8	221
1100	0.100	19.39	48	21.0	2.72	7124	0.20	2.3	242.8	240

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1100	0.100	19.39	48	21.0	2.72	7124	0.20	2.3	242.8	240

Additional Purge/Sample Data

Total Volume Purged (gal):	2			Ambient Air Temperature (°F):	84		
Sample Time (CT):	1100	Pump Duration (mins) - i.e., total time pump ran during sample collection	100			Color/ Odor	Light Brown
Final DTW (ft BTOC):	20.38	Final Turbidity:	235	Filter Type and Size:	0.45 um	Pump Used:	Bladder 47677 MP-50: 2101

Sampler Name: CHARLIE HOWARD Signature: Charlie Howard Date: 8/18/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~

Groundwater Sampling Form (GWSF) Date: 8.18.20 Sheet 2 of 2

Well ID: GAF 441 U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 8.18.20 CW

Pump Settings (ID & psi or mV): #103, 30 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 8.18.20 CW

Sample ID: GAF GW441U08182020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1110 } All w/in 15 min

Time (CT) last sample bottle placed on ice: 1250 }

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☐ Yes ☑ No

If yes, Lot# NA

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 4 ☑ Ra-226/Ra-228

3 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, S^{2-}, TKN, NO_2/NO_3

16 total bottles.

General Comments/Observations: 1-500mL PO_4 (H_2SO_4 pres), 1-250mL S^{2-} F (Zn Acetate, NaOH pres), 2-1L TSS (No Pres), 1-500mL TDS, 1-250mL Metals (HNO_3 pres), 1-250mL TKN (H_2SO_4 pres), 1-250mL NO_2/NO_3 (H_2SO_4 pres), 1-250mL anions/gen chem (no pres), 2-40mL VOA (H_2SO_4 pres), 2-1L Rad (HNO_3 pres), 1-250mL Diss Metals (HNO_3 pres), 2-1L Diss Rad (HNO_3 pres)

Filter blank taken @ 1050, Field Blank taken @ 1100

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 08.18.20

Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 8/19/20 Sheet 1 of 2

Well ID:	GAF-442V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	62 to 73	Initial Depth to Water (ft BTOC):	43.50	Total Depth (ft BTOC):	73
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/HO/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1300

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1300	0.100	43.62	67	21.7	6.88	2470	0.60	6.0	-36.7	64.2
1305	0.100	44.31	67	21.5	6.96	2473	0.61	6.1	-35.2	64.8
1310	0.100	44.97	67	21.4	6.90	2460	0.64	6.4	-33.9	66.3
1315	0.100	45.76	67	21.3	6.90	2456	0.68	6.8	-33.4	67.1
1320	0.100	46.32	67	21.2	6.90	2452	0.72	7.2	-32.9	65.9
1325	0.100	47.01	67	21.2	6.89	2446	0.49	4.9	-31.2	68.1
1330	0.100	47.68	67	21.1	6.89	2444	0.41	4.1	-31.5	70.3

8/19/20 JM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1335	0.100	48.45	67	21.5	6.86	2444	0.37	3.7	-33.1	72.6

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal			Ambient Air Temperature (°F):	80		
Sample Time (CT):	1335	Pump Duration (mins) - i.e., total time pump ran during sample collection	1 hr 25 min			Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	58.96	Final Turbidity:	31.4	Filter Type and Size:	0.45	Pump Used:	MP50:016249 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/19/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 8/19/20 Sheet 2 of 2

Well ID: GAF-44U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 8/19 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 35 8/19 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 8/19 JM

Sample ID: GAF-GW-44U-08192020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1340

Time (CT) last sample bottle placed on ice: 1500

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PACE

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20200819_JLM 8/19 JM

General Comments/Observations: 8/19/20 JM

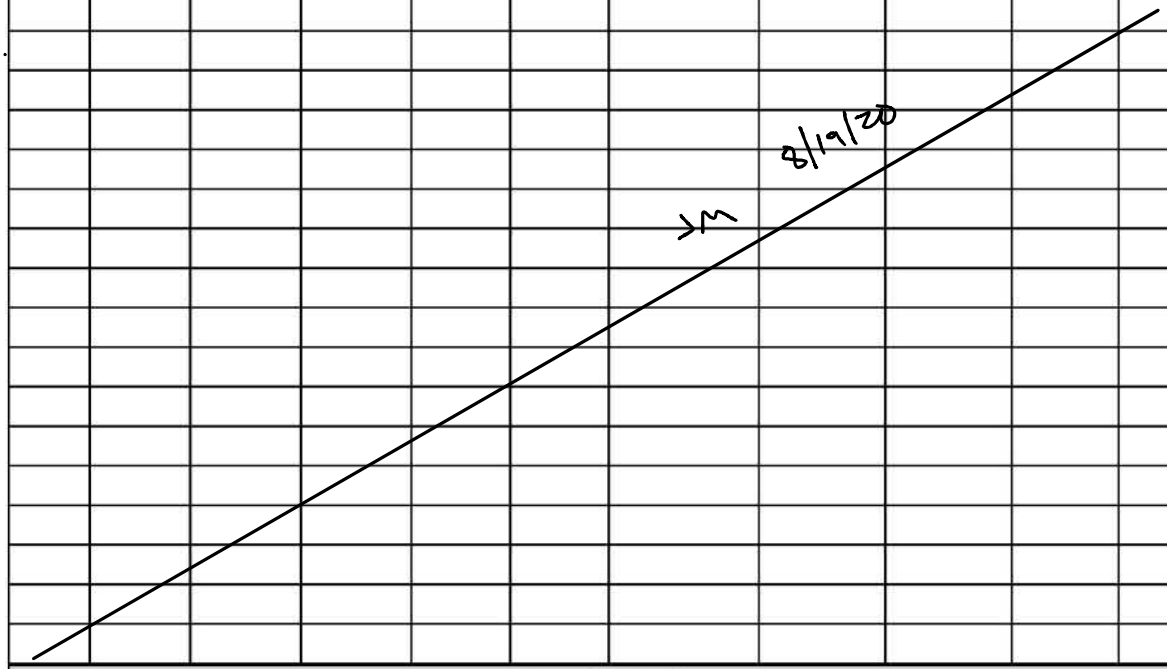
Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/19/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 8/19/20 Sheet 1 of 2

Well ID:	GAF-44V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	53 to 63	Initial Depth to Water (ft BTOC):	36.30	Total Depth (ft BTOC):	63
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/HO/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0700

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0700	0.100	37.10	58	19.3	6.64	2774	5.41	54.1	176.2	118
0705	0.106	37.87	58	19.0	6.61	2778	1.21	12.1	193.4	54.2
0710	0.100	38.72	58	18.9	6.58	2781	0.54	5.4	216.8	41.3
0715	0.106	39.54	58	18.8	6.56	2786	0.43	4.3	221.7	38.1
0720	0.100	40.36	58	18.8	6.54	2795	0.32	3.2	225.3	35.6
0725	0.106	40.92	58	18.8	6.53	2798	0.31	3.1	225.3	34.3
0730	0.100	41.64	58	18.8	6.52	2801	0.30	3.0	225.3	33.7



Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0735	0.100	42.30	58	18.8	6.53	2807	0.32	3.2	224.9	34.1

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	80		
Sample Time (CT):	0735	Pump Duration (mins) - i.e., total time pump ran during sample collection	1 hr 20 min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	51.52	Final Turbidity:	50.3	Filter Type and Size:	0.45	Pump Used:	MP50:016249 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/19/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 8/19/20 Sheet 2 of 2

Well ID: GAF-444U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 8/19 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 30 8/19 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 8/19 JM

Sample ID: GAF-GW-444U-08192020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0740

Time (CT) last sample bottle placed on ice: 0855

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20200819_JLM 8/19JM

General Comments/Observations: GAF-AQ-900--08192020 AT 0900 AND GAF-AQ-901 -08192020 COLLECTED AT 0905 USING DI WATER SUPPLIED BY TA ON 4/7/20 8/19 JM

8/19 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/19/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 8/18/20 Sheet 1 of 2

Well ID:	GAF-948U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	11.6 to 16.6	Initial Depth to Water (ft BTOC):	7.00	Total Depth (ft BTOC):	16.6
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/HO/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1308

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or <5
1310	0.100	7.00	14	24.0	6.77	1898	5.47	54.7	-62.4	218
1315	0.100	8.01	14	20.1	6.71	2546	0.90	9.0	-14.1	202
1320	0.100	8.46	14	20.4	6.74	2536	0.80	8.0	-11.1	184
1325	0.100	8.91	14	21.0	6.77	2524	0.71	7.1	-7.3	161
1330	0.100	9.32	14	21.6	6.75	2481	0.67	6.7	-2.1	141
1335	0.100	9.74	14	21.1	6.73	2422	0.64	6.4	3.6	127

JM 8/18/20

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1340	0.100	10.02	14	21.1	6.71	2372	0.60	6.0	10.2	103

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	87		
Sample Time (CT):	1040	Pump Duration (mins) - i.e., total time pump ran during sample collection	1 hr 45min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	11.23	Final Turbidity:	14.28	Filter Type and Size:	0.45	Pump Used:	MP50:016249 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/18/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 8/18/20 Sheet 2 of 2

Well ID: GAF-447U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 8/18 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 15 8/18 JM

Stability reached? ☐ Yes ☒ No

If no, provide explanation: 8/18 JM

Sample ID: GAF-GW-447U-08182020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☒ Yes ☐ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1345

Time (CT) last sample bottle placed on ice: 1525

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20200818_JLM 8/18 JM

General Comments/Observations: GAF-AQ-900A-08182020 AT 1430 AND GAF-AQ-901A-08182020 COLLECTED AT 1445 USING DI WATER SUPPLIED BY TA ON 4/17/20 8/18 JM
8/18 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/18/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 8/18/20 Sheet 1 of 2

Well ID:	GAF-948U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	38 to 53	Initial Depth to Water (ft BTOC):	14.42	Total Depth (ft BTOC):	53
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK HAYDEN ORR/HO/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1004

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or <5
1005	0.100	14.49	45.5	21.9	5.95	1456	0.79	7.9	-108.1	562
1010	0.100	15.31	45.5	21.6	5.97	1458	0.82	8.2	-162.3	211
1015	0.100	16.22	45.5	21.3	5.98	1460	0.94	9.4	-115.5	282
1020	0.100	17.04	45.5	20.9	6.03	1453	0.80	8.0	-116.3	301
1025	0.100	18.01	45.5	20.8	6.05	1446	0.69	6.9	-118.0	306
1030	0.100	18.71	45.5	20.9	6.11	1446	0.44	4.4	-119.4	314
1035	0.100	19.61	45.5	20.8	6.12	1446	0.41	4.1	-119.7	317

JM 8/18/20

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1040	0.100	20.13	45.5	20.8	6.13	1446	0.37	3.7	-120.2	328

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	87		
Sample Time (CT):	1040	Pump Duration (mins) - i.e., total time pump ran during sample collection	2 hr	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	30.61	Final Turbidity: 53.5	Filter Type and Size: 0.45	Pump Used:	MP50:016249 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/18/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 8/18/20 Sheet 2 of 2

Well ID: GAF-448U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 8/18 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 25 8/18 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 8/18 JM

Sample ID: GAF-GW-448U-08182020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A2037

MS/MSD collected? ☒ Yes ☐ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1045

Time (CT) last sample bottle placed on ice: 1240

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# PROVIDED BY PINE.

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20200818_JLM 8/18 JM

General Comments/Observations: 8/18/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 8/18/20
Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 8/20/20 Sheet 1 of 2

Well ID:	GAF 48U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	47 to 57	Initial Depth to Water (ft BTOC):	17.42	Total Depth (ft BTOC):	57
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CH-(AECOM), Coleman Hill CH AECOM 8.20.20							Start Purge Time (CT):	1230

Water Quality Observations										
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0750	0.100	17.50	52	16.9	6.22	114.7	1.58	16.3	244.8	332
0755	0.100	18.23	52	16.9	5.80	117.1	1.40	14.5	234.8	322
0800	0.100	18.91	52	16.9	5.79	116.6	1.44	14.9	227.1	302
0805	0.100	19.20	52	16.8	5.77	115.5	1.58	16.2	221.2	296
0810	0.100	19.81	52	16.8	5.71	114.1	1.44	15.8	218.2	249
0815	0.100	20.59	52	16.8	5.67	112.4	1.37	14.1	216.1	220
0820	0.100	21.44	52	16.8	5.61	102.6	1.44	16.2	215.3	141
0825	0.100	22.35	52	16.8	5.54	96.7	1.65	17.0	214.0	91.0
0830	0.100	23.31	52	16.8	5.50	88.1	1.77	18.2	214.4	77
0835	0.100	24.07	52	16.8	5.45	78.2	1.87	19.1	214.7	42.3
0840	0.100	24.58	52	16.9	5.40	74.7	1.90	19.6	214.9	21.3
0845	0.100	24.91	52	17.0	5.41	74.9	1.91	19.7	214.8	19.3
0850	0.100	25.84	52	17.0	5.42	75.4	1.92	19.9	214.9	18.1
0855	0.100	26.66	52	17.1	5.45	76.7	1.90	19.7	212.1	17.2
0900	0.100	27.15	52	17.1	5.42	77.3	1.80	19.0	214.6	16.2
0905	0.100	27.73	52	17.2	5.44	74.0	1.82	18.9	214.3	14.6
0910	0.100	28.20	52	17.2	5.44	77.0	1.82	19.0	213.8	12.2
0915	0.100	28.77	52	17.4	5.53	77.8	1.86	19.4	212.5	13.3

Sample Readings										
0915	0.100	28.77	52	17.4	5.53	77.8	1.86	19.4	212.5	13.3
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data									
Total Volume Purged (gal):	2.5			Ambient Air Temperature (°F):		73			
Sample Time (CT):	0915	Pump Duration (mins) - i.e., total time pump ran during sample collection			110	Color/ Odor	Clear / NA		
Final DTW (ft BTOC):	36.85	Final Turbidity:	9.79	Filter Type and Size:	0.45 µm	Pump Used:	Bladder 47677 MP-50: 2101		

Sampler Name: CHARLIE HOWARD Signature: Charles Howard Date: 8/20/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 8.20.20 Sheet 2 of 2

Well ID: GAF 489U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 8.20.20 CH

Pump Settings (ID & psi or mV): #103, 30 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 8.20.20 CH

Sample ID: GAF GAF489U08202020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 0925 } All w/in 15 min
Time (CT) last sample bottle placed on ice: 1115 }

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☐ Yes ☑ No

If yes, Lot# NA

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 4 ☑ Ra-226/Ra-228

3 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, S^{2-}, TKN, NO_2/NO_3

16 total bottles.

General Comments/Observations: 1-500mL PO_4 (H_2SO_4 pres), 1-250mL S^{2-} F (Zn Acetate NaOH pres), 2-1L TSS (No Pres), 1-500mL TDS
1-250mL Metals (HNO_3 pres), 1-250mL TKN (H_2SO_4 pres), 1-250mL NO_2/NO_3 (H_2SO_4 pres), 1-250mL anions/gen chem (no pres)
2-40mL VOA (H_2SO_4 pres), 2-1L Rad (HNO_3 pres), 1-250mL Diss Metals (HNO_3 pres), 2-1L Diss Rad (HNO_3 pres)

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 08.20.20
Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620
Groundwater Sampling Form (GWSF) Date: 8/19/20 Sheet 1 of 2

Well ID:	GAF 526U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	63 to 68	Initial Depth to Water (ft BTOC):	23.74	Total Depth (ft BTOC):	68
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CH-(AECOM), Coleman Hill CH AECOM 8.19.20							Start Purge Time (CT):	1230

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1230	0.120	23.35	65	19.0	5.93	1422	1.31	14.2	47.1	11.6
1235	0.100	24.41	65	18.6	6.18	1433	0.65	7.0	36.7	9.28
1240	0.100	24.77	65	18.8	6.41	1426	0.64	6.9	8.1	8.06
1245	0.100	25.04	65	19.1	6.57	1432	0.55	5.8	-21.4	7.42
1250	0.100	25.46	65	19.1	6.64	1434	0.47	5.1	-31.6	7.35
1300	0.100	25.93	65	19.2	6.70	1440	0.37	4.1	-49.2	3.72
1305	0.100	26.32	65	19.9	6.77	1477	0.30	3.3	-63.0	3.38
1310	0.100	26.68	65	19.8	6.78	1487	0.28	3.1	-70.41	4.66

8.19 CH

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1310	0.100	26.68	65	19.8	6.78	1487	0.28	3.1	-70.41	4.66

Additional Purge/Sample Data

Total Volume Purged (gal):	1.5			Ambient Air Temperature (°F):	77		
Sample Time (CT):	1310	Pump Duration (mins) - i.e., total time pump ran during sample collection	120			Color/ Odor	Clear / NA
Final DTW (ft BTOC):	28.18	Final Turbidity:	5.09	Filter Type and Size:	0.45 um	Pump Used:	Bladder 47677 MP-50: 2101

Sampler Name: CHARLIE HOWARD Signature: Charlie Howard Date: 8/19/20
Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 8.19.20 Sheet 2 of 2

Well ID: GAF 526U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 8.19.20 CH

Pump Settings (ID & psi or mV): #103, 38 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 8.19.20 CH

Sample ID: GAF GAF526U08192020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1320
Time (CT) last sample bottle placed on ice: 1520
} All w/in 15 min

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☐ Yes ☑ No

If yes, Lot# NA

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 4 ☑ Ra-226/Ra-228

3 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, S^{2-}, TKN, NO_2/NO_3

16 total bottles.

General Comments/Observations: 1-500mL PO_4 (H_2SO_4 pres), 1-250mL S^{2-} F (Zn Acetate NaOH pres), 2-1L TSS (No Pres), 1-500mL TDS, 1-250mL Metals (HNO_3 pres), 1-250mL TKN (H_2SO_4 pres), 1-250mL NO_2/NO_3 (H_2SO_4 pres), 1-250mL anions/gen chem (no pres), 2-40mL VOA (H_2SO_4 pres), 2-1L Rad (HNO_3 pres), 1-250mL Diss Metals (HNO_3 pres), 2-1L Diss Rad HNO_3 pres)

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 08.19.20
Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 8/18/20 Sheet 1 of 2

Well ID:	GAF 541U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	53 to 63	Initial Depth to Water (ft BTOC):	14.58	Total Depth (ft BTOC):	63
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CH-(AECOM), Coleman Hill CH AECOM 8.18.20							Start Purge Time (CT):	1300

Water Quality Observations										
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1305	0.100	13.62	58	22.8	5.24	4123	2.59	30.4	102.3	117
1310	0.100	14.62	58	21.9	5.77	4050	0.62	7.2	97.5	11.9
1315	0.100	15.30	58	22.3	5.87	4095	0.36	4.2	87.8	8.34
1320	0.100	15.78	58	22.2	5.88	4097	0.32	3.8	82.1	8.47
1325	0.100	16.36	58	21.9	5.88	4099	0.30	3.5	78.0	8.59
1330	0.100	17.11	58	21.8	5.91	4110	0.48	5.5	73.1	8.37

Sample Readings										
1330	0.100	17.11	58	21.8	5.91	4110	0.48	5.5	73.1	8.37
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data									
Total Volume Purged (gal):	1			Ambient Air Temperature (°F):		86			
Sample Time (CT):	1330	Pump Duration (mins) - i.e., total time pump ran during sample collection			90	Color/ Odor	Clear / NA		
Final DTW (ft BTOC):	31.63	Final Turbidity:	12.0	Filter Type and Size:	0.45 µm	Pump Used:	Bladder 47677 MP-50: 2101		

Sampler Name: CHARLIE HOWARD Signature: Charles Howard Date: 8/18/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 8.18.20 Sheet 2 of 2

Well ID: GAF 541 U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 8.18.20 CH

Pump Settings (ID & psi or mV): #102, 35 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 8.18.20 CH

Sample ID: GAF GAF541U08182020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1340 } All w/in 15 min

Time (CT) last sample bottle placed on ice: 1510 }

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☐ Yes ☑ No

If yes, Lot# NA

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 4 ☑ Ra-226/Ra-228

3 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, S^{2-}, TKN, NO_2/NO_3

16 total bottles.

General Comments/Observations: 1-500mL PO_4 (H_2SO_4 pres), 1-250mL S^{2-} F (Zn Acetate NaOH pres), 2-1L TSS (No Pres), 1-500mL TDS
1-250mL Metals (HNO_3 pres), 1-250mL TKN (H_2SO_4 pres), 1-250mL NO_2/NO_3 (H_2SO_4 pres), 1-250mL anions/gen chem (no pres)
2-40mL VOA (H_2SO_4 pres), 2-1L Rad (HNO_3 pres), 1-250mL Diss Metals (HNO_3 pres), 2-1L Diss Rad HNO_3 pres)

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 08.18.20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: 60566620

Groundwater Sampling Form (GWSF) Date: 8/19/20 Sheet 1 of 2

Well ID:	GAF S3	Well Diameter (in):	2	Screen Inteval (ft BTOC):	51 to 61	Initial Depth to Water (ft BTOC):	27.93	Total Depth (ft BTOC):	61
Sample Team Members: Name/Affiliation/Initials:	C. Howard-CH-(AECOM), Coleman Hill CH AECOM 8.19.20							Start Purge Time (CT):	0745

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0745	0.110	28.35	56	18.0	4.74	2313	0.74	7.9	269.8	114
0750	0.110	28.49	56	17.9	4.04	2398	0.61	6.4	260.1	118
0755	0.110	28.62	56	17.9	3.72	2428	0.55	5.9	254.8	129
0800	0.110	28.62	56	17.9	3.66	2401	0.49	5.2	249.1	122
0805	0.110	28.62	56	17.9	3.63	2392	0.36	3.8	248.7	120
0810	0.110	28.65	56	17.8	3.63	2371	0.29	3.2	249.1	56
0815	0.110	28.68	56	17.8	3.63	2364	0.24	8.6	250.9	28.8
0820	0.110	28.68	56	17.8	3.62	2369	0.22	2.3	252.2	21.1
0825	0.110	28.68	56	17.8	3.62	2377	0.20	2.1	254.1	19.2
0830	0.110	28.68	56	17.9	3.61	2391	0.19	2.0	255.1	12.91
0835	0.110	28.68	56	17.9	3.61	2407	0.17	1.9	256.5	9.95
0840	0.110	28.68	56	17.9	3.60	2414	0.17	1.8	258.1	8.62
0845	0.110	28.68	56	17.9	3.60	2427	0.15	1.6	259.0	8.46
0850	0.110	28.68	56	17.9	3.60	2433	0.16	1.7	259.3	7.00
0855	0.110	28.68	56	17.9	3.60	2439	0.14	1.6	260.1	7.77
0900	0.110	28.68	56	17.9	3.60	2446	0.13	1.4	260.7	7.43
							8.19.20			

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0900	0.110	28.68	56	17.9	3.60	2446	0.13	1.4	260.7	7.43

Additional Purge/Sample Data

Total Volume Purged (gal):	3	Ambient Air Temperature (°F):	72		
Sample Time (CT):	0900	Pump Duration (mins) - i.e., total time pump ran during sample collection	70	Color/ Odor	Clear / NA
Final DTW (ft BTOC):	28.66	Final Turbidity: 6.46	Filter Type and Size: 0.45 µm	Pump Used:	Bladder 47677 MP-50: 2101

Sampler Name: CHARLIE HOWARD Signature: Charlie Howard Date: 8/19/20

Reviewed by: SARA MEISSNER Signature: Sara Meissner Date:

Field Blank 0800, Filter Blank 0740

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 8.19.20 Sheet 2 of 2

Well ID: GAF S3

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 8.19.20 CH

Pump Settings (ID & psi or mV): #103, 35 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 8.19.20 CH

Sample ID: GAF GAF S3 08192020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 0910 } All w/in 15 min
Time (CT) last sample bottle placed on ice: 1020 }

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☐ Yes ☑ No

If yes, Lot# NA

Samples collected for the following analysis: Sample Order by #'s below

1 ☑ Metals 2 ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry 4 ☑ Ra-226/Ra-228

3 ☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, S^{2-}, TKN, NO_2/NO_3

16 total bottles.

General Comments/Observations: 1-500mL PO_4 (H_2SO_4 pres), 1-250mL S^{2-} F (Zn Acetate NaOH pres), 2-1L TSS (No Pres), 1-500mL TDS
1-250mL Metals (HNO_3 pres), 1-250mL TKN (H_2SO_4 pres), 1-250mL NO_2/NO_3 (H_2SO_4 pres), 1-250mL anions/gen chem (no pres)
2-40mL VOA (H_2SO_4 pres), 2-1L Rad (HNO_3 pres), 1-250mL Diss Metals (HNO_3 pres), 2-1L Diss Rad HNO_3 pres)

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 08.19.20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~

Groundwater Sampling Form (GWSF) Date: 10.21.20 Sheet 1 of 2

Well ID:	GAF19R	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42 to 52	Initial Depth to Water (ft BTOC):	27.87	Total Depth (ft BTOC):	52
Sample Team Members: Name/Affiliation/Initials:	Charlie Howard/AECOM/CH; Vann Turner /AECOM/VT							Start Purge Time (CT):	0730

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0735	0.200	28.49	47	16.3	3.57	3133	7.02	73.3	231.9	12.1
0740	0.200	28.51	47	16.3	3.56	3143	6.94	70.1	232.1	9.1
0745	0.200	28.55	47	16.3	3.55	3154	6.69	68.7	233.1	6.50
0750	0.200	28.55	47	16.3	3.55	3165	6.50	66.9	234.1	6.01
0755	0.200	28.61	47	16.3	3.56	3179	6.34	65.2	235.3	5.58
0800	0.200	28.61	47	16.2	3.57	3189	6.36	64.4	236.4	4.82
0805	0.200	28.61	47	16.3	3.59	3193	6.18	63.8	237.1	4.97
0810	0.200	28.61	47	16.3	3.59	3199	5.97	59.3	238.6	4.06

10.21.20

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0810	0.200	28.61	47	16.3	3.59	3199	5.97	59.3	238.6	4.06

Additional Purge/Sample Data

Total Volume Purged (gal):	3.0	Ambient Air Temperature (°F):	80				
Sample Time (CT):	0810	Pump Duration (mins) - i.e., total time pump ran during sample collection	220			Color/ Odor	Clear / No Odor
Final DTW (ft BTOC):	28.46	Final Turbidity:	19.5	Filter Type and Size:	Disposable 0.45 µm	Pump Used:	MP-50-46711 Bladder-Dedicated

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10.21.20

Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 10·21·20 Sheet 2 of 2

Well ID: GAF 19R

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 10·21·20 CMS

Pump Settings (ID & psi or mV): #103, 20 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 10·21·20 CMS

10·21·20 CMS

Sample ID: GAFGW 19R 10212020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☑ Yes ☐ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 0825

Time (CT) last sample bottle placed on ice: 1200

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 700-1725

Samples collected for the following analysis:

☑ Metals ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry ☑ Ra-226/Ra-228

☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, Sulfide, TKN, Nitrate/Nitrite

Bottles/Analysis (Preservative): ~~General Comments/Observations~~: 1-500mL PO_4 (sulfuric), 1-500mL TDS, 2-1L TSS, 1-250mL sulfide (Zn Oxide) 2-1L Radium (nitric), 2-1L Radium-dis (nitric), 1-250mL Metals (nitric), 1-250mL Metals-dis (nitric) 1-250mL TKN (sulfuric), 1-250mL nitrate/nitrite (sulfuric), 1-250 gen.chem/anions, 2-40mL VOAs TOC (sulfuric)

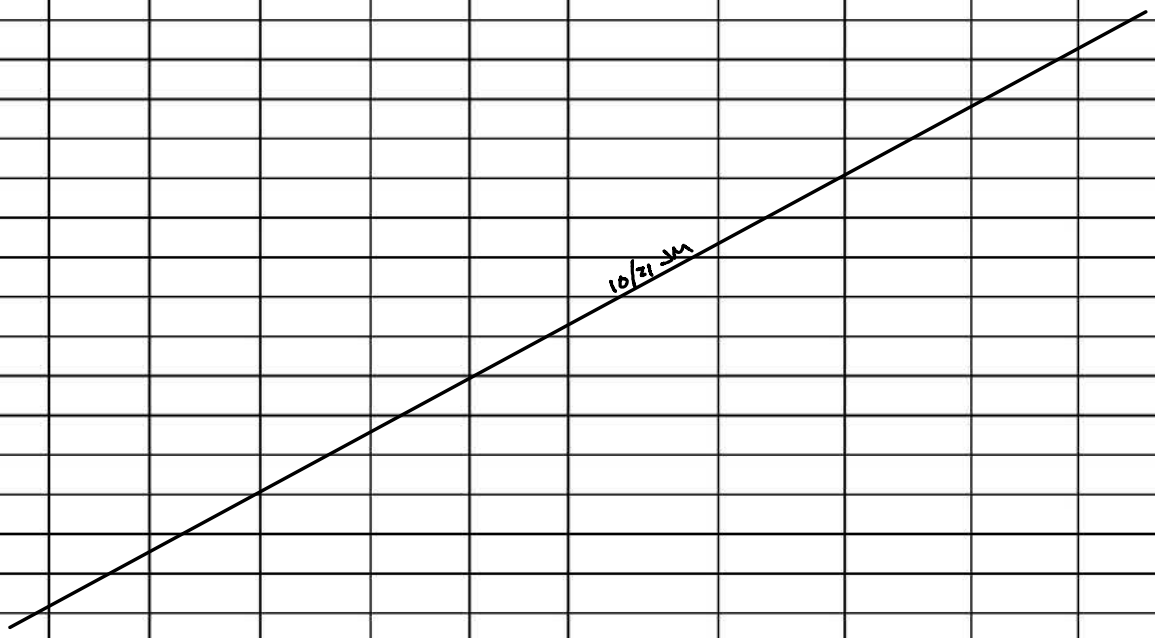
Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10·21·20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 10/21/20 Sheet 1 of 2

Well ID:	GAF-20	Well Diameter (in):	2	Screen Inteval (ft BTOC):	45.0 to 55.0	Initial Depth to Water (ft BTOC):	25.48	Total Depth (ft BTOC):	55
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK NEILS HEDVER/NH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0702

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0705	0.100	25.65	50	17.0	5.99	1805	9.74	97.4	71.7	21.6
0710	0.100	25.68	50	17.1	6.09	1748	9.01	90.1	54.9	9.21
0715	0.100	25.71	50	17.0	6.13	1709	0.69	6.9	44.1	12.2
0720	0.100	25.73	50	17.0	6.19	1678	0.49	4.9	30.2	14.6
0725	0.100	25.74	50	16.9	6.20	1661	0.43	4.3	25.6	17.2
0730	0.100	25.75	50	16.9	6.22	1652	0.40	4.0	16.2	18.1
0735	0.100	25.75	50	16.9	6.22	1645	0.38	3.8	15.5	19.3



Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0740	0.100	25.76	50	17.0	6.22	1638	0.36	3.6	13.3	19.6

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	70°		
Sample Time (CT):	0740	Pump Duration (mins) - i.e., total time pump ran during sample collection	3hr 40min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	25.75	Final Turbidity:	3.37	Filter Type and Size:	0.45	Pump Used:	MP50:2108 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/21/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 10/21/20 Sheet 2 of 2

Well ID: GAF-20

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 10/21 JM

Pump Settings (ID & psi or mV): ID:104 PSI:25 10/21 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 10/21 JM

Sample ID: GAF-GW-20 10212020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: A7073

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☒ Yes ☐ No Field Duplicate ID: GAF-GW-903A-10212020

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0745

Time (CT) last sample bottle placed on ice: 1120

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20201021_JLM 10/21 JM

General Comments/Observations: 10/21/20

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/21/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~

Groundwater Sampling Form (GWSF) Date: 10.21.20 Sheet 1 of 2

Well ID:	GAF 22	Well Diameter (in):	2	Screen Inteval (ft BTOC):	42 to 52	Initial Depth to Water (ft BTOC):	26.84	Total Depth (ft BTOC):	52
Sample Team Members: Name/Affiliation/Initials:	Charlie Howard/AECOM/CH; Vann Turner/AECOM/VT							Start Purge Time (CT):	1253

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1300	0.100	27.56	47	20.1	6.15	445.1	9.03	99.3	214.4	71.4
1305	0.100	28.81	47	19.8	6.61	444.4	8.21	92.2	209.1	28.2
1310	0.100	29.96	47	19.1	6.70	445.4	7.74	83.3	203.2	12.1
1315	0.100	32.75	47	19.1	6.72	439.9	7.52	81.2	200.1	9.6
1320	0.100	32.99	47	19.2	6.79	434.8	7.29	79.3	196.3	7.90
1325	0.100	33.21	47	19.7	6.81	435.3	7.01	78.1	191.2	7.72
1330	0.100	33.46	47	20.0	6.90	432.1	6.94	76.4	187.6	6.89
1335	0.100	34.04	47	20.1	6.97	433.9	7.33	79.2	181.2	4.21
1340	0.100	34.84	47	20.2	7.03	434.8	7.54	848	178.4	2.75
1345	0.100	35.01	47	20.2	7.02	433.8	7.61	79.6	176.6	3.48

10.21.20 CH

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1345	0.100	35.01	47	20.2	7.02	433.8	7.61	79.6	176.6	3.48

Additional Purge/Sample Data

Total Volume Purged (gal):	3			Ambient Air Temperature (°F):	82		
Sample Time (CT):	1345	Pump Duration (mins) - i.e., total time pump ran during sample collection	75			Color/ Odor	Clear/NA
Final DTW (ft BTOC):	42.25	Final Turbidity:	35.6	Filter Type and Size:	Disposable 0.45 µm	Pump Used:	MP-50-46711 Bladder-Dedicated

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10.21.20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 10·21·20 Sheet 2 of 2

Well ID: GAF 22

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 10·21·20 CMS

Pump Settings (ID & psi or mV): #103, 20 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 10·21·20 CMS

10·21·20 CMS

Sample ID: GAFGW22 10212020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1350

Time (CT) last sample bottle placed on ice: 1505

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 700-1725

Samples collected for the following analysis:

☑ Metals ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry ☑ Ra-226/Ra-228

☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, Sulfide, TKN, Nitrate/Nitrite

Bottles/Analysis (Preservative): ~~General Comments/Observations~~: 1-500mL PO_4 (sulfuric), 1-500mL TDS, 2-1LTSS, 1-250mL sulfide (Zn Oxide) 2-1L Radium (nitric), 2-1L Radium-dis (nitric), 1-250mL Metals (nitric), 1-250mL Metals-dis (nitric) 1-250mL TKN (sulfuric), 1-250mL nitrate/nitrite (sulfuric), 1-250 gen.chem/anions, 2-40mL VOAs TOC (sulfuric)

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10·21·20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02

Groundwater Sampling Form (GWSF) Date: 10/21/20 Sheet 1 of 2

Well ID:	GAF-26	Well Diameter (in):	2	Screen Inteval (ft BTOC):	96 to 106	Initial Depth to Water (ft BTOC):	22.13	Total Depth (ft BTOC):	106
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL / JM / AECOM / SAMPLING PAPERWORK NEILS HEDNER / NH / AECOM / SAMPLING SETUP							Start Purge Time (CT):	1333

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1335	0.130	22.15	101	20.9	7.22	1424	3.33	33.3	4.1	9.11
1340	0.130	22.15	101	19.5	7.49	1414	1.48	14.8	-125.1	7.23
1345	0.130	22.15	101	19.0	7.44	992	0.87	8.7	-99.2	6.97
1350	0.130	22.15	101	18.9	7.39	987	0.51	5.1	-88.3	6.21
1355	0.130	22.15	101	18.9	7.53	933	0.47	4.7	-92.1	4.81
1400	0.130	22.15	101	18.5	7.66	923	0.42	4.2	-104.1	4.66

10/21 JM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1405	0.130	22.15	101	18.5	7.68	919	0.39	3.9	-110.2	4.71

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	70°
Sample Time (CT): 1405	Pump Duration (mins) - i.e., total time pump ran during sample collection: 1hr 6min	Color/Odor:	TRANSLUCENT
Final DTW (ft BTOC): 22.15	Final Turbidity: 19.6	Filter Type and Size: N/A	Pump Used: MP50 : 2108 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/21/20

Reviewed by: ______ Signature: ______ Date: ______

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 10/21/20 Sheet 2 of 2

Well ID: GAF-26

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 10/21 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 40 10/22 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 10/21 JM

Sample ID: GAF-GW-26 10212020

☒ Unfiltered ☐ Filtered ☐ Both

Filter ID: N/A

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1410

Time (CT) last sample bottle placed on ice: 1515

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☐ Other REFER TO GAF-DRE-202010 - JLM 10/21 JM

General Comments/Observations: GAF-AQ-900A-10222020 COLLECTED AT 1400 AND GAF-AQ-901A-10222020 AT 1420 USING TA SUPPLIED DI WATER ON 10/11/20 10/22 JM

10/22 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/21/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 10/21/20 Sheet 1 of 2

Well ID:	GAF-27	Well Diameter (in):	2	Screen Inteval (ft BTOC):	80 to 90	Initial Depth to Water (ft BTOC):	20.55	Total Depth (ft BTOC):	90
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK NEILS HEDVER/NH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1128

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or <5
1130	0.100	20.60	85	20.5	7.25	1634	4.48	44.8	32.3	0.75
1135	0.100	21.55	85	20.7	7.11	1715	1.07	10.7	1.0	1.65
1140	0.100	21.99	85	20.6	7.01	1718	0.66	6.6	0.9	0.96
1145	0.100	22.65	85	20.7	7.00	1734	0.45	4.5	-2.0	0.82
1150	0.100	23.21	85	20.9	6.96	17.41	0.30	3.0	-8.2	0.65
1155	0.100	24.00	85	20.9	6.89	1739	0.25	2.5	-9.3	0.49

Sample Readings

1200	0.100	24.62	85	20.9	6.90	1735	0.23	2.3	-8.6	0.68
Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	80°		
Sample Time (CT):	1200	Pump Duration (mins) - i.e., total time pump ran during sample collection	1hr 20min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	28.35	Final Turbidity:	0.61	Filter Type and Size:	N/A	Pump Used:	MP50 : 2108 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/21/20
Reviewed by: _____ Signature: _____ Date: _____

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 10/21/20 Sheet 2 of 2

Well ID: GAF-27

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 10/21 SM

Pump Settings (ID & psi or mV): ID:102 PSI:35 10/21 SM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 10/21 SM

Sample ID: GAF-GW-27 10212020

☒ Unfiltered ☐ Filtered ☐ Both

Filter ID: N/A

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1205

Time (CT) last sample bottle placed on ice: 1320

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☐ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☐ TOC ☐ Other REFER TO GAF_DRE_202010 - SLM 10/21 SM

General Comments/Observations: 10/21 SM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/21/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02

Groundwater Sampling Form (GWSF) Date: 10/19/20 Sheet 1 of 2

Well ID:	GAF-439V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	32.5 to 37.5	Initial Depth to Water (ft BTOC):	6.11	Total Depth (ft BTOC):	37.5
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL / JM / AECOM / SAMPLING PAPERWORK NEILS HEDNER / NH / AECOM / SAMPLING SETUP							Start Purge Time (CT):	1203

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
			Stabilization Criteria:	+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1205	0.100	6.70	35	18.9	6.65	1827	3.12	31.2	80.4	54.2
1210	0.100	6.39	35	18.7	6.65	1838	1.64	16.4	66.2	63.1
1215	0.100	6.56	35	18.6	6.65	1851	0.94	0.94	50.6	84.6
1220	0.100	6.67	35	18.7	6.66	1855	0.81	8.1	22.3	102
1225	0.100	6.73	35	18.7	6.68	1858	0.73	7.3	-1.7	156
1230	0.100	6.78	35	18.7	6.67	1859	0.48	4.8	-9.1	245
1235	0.100	6.84	35	18.7	6.67	1860	0.43	4.3	-18.2	212
1240	0.100	6.90	35	18.7	6.66	1862	0.40	4.0	-26.8	217
1245	0.100	6.95	35	18.8	6.66	1864	0.38	3.8	-27.3	226

10/19/20 JM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1250	0.100	7.01	35	18.9	6.67	1865	0.36	3.6	-29.0	231

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	70°		
Sample Time (CT):	1250	Pump Duration (mins) - i.e., total time pump ran during sample collection	1hr 2min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	7.55	Final Turbidity: 112	Filter Type and Size: 0.45	Pump Used:	MP50: 2108 PUMP: 29846

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/19/20

Reviewed by: ______ Signature: ______ Date: ______

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 10/19/20 Sheet 2 of 2

Well ID: GAF-439V

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 10/19 JM

Pump Settings (ID & psi or mV): ID: 99 PSI: 20 10/19 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 10/19 JM

Sample ID: GAF-GW-439V-10192020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: AZ073

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1255

Time (CT) last sample bottle placed on ice: 1410

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# 311

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_202010 - JLM 10/19 JM

General Comments/Observations: GAF-AQ-900A-10192020 COLLECTED AT 1340 AND GAF-AQ-901A-10192020 USING TA SUPPLIED DI WATER ON 10/16/20 10/19 JM

10/19 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/19/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~

Groundwater Sampling Form (GWSF) Date: 10·20·20 Sheet 1 of 2

Well ID:	GAF 4401	Well Diameter (in):	2	Screen Inteval (ft BTOC):	44 to 54	Initial Depth to Water (ft BTOC):	14.33	Total Depth (ft BTOC):	54
Sample Team Members: Name/Affiliation/Initials:	Charlie Howard/AECOM/CH; Vann Turner /AECOM/VT							Start Purge Time (CT):	1320

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1325	0.100	15.17	50	18.8	7.06	1748	2.81	30.3	167.1	128
1330	0.100	15.51	50	18.6	6.94	1801	1.94	20.1	151.1	144
1335	0.100	15.94	50	18.4	6.68	1844	1.33	14.2	134.8	156
1340	0.100	16.01	50	18.4	6.67	1861	1.11	12.1	127.1	112
1345	0.100	16.12	50	18.4	6.66	1870	1.04	11.0	120.6	95.5
1350	0.100	16.16	50	18.2	6.67	1881	0.99	10.4	111.2	75.2
1355	0.100	16.20	50	18.2	6.67	1892	0.94	9.8	108.2	52.1
1400	0.100	16.26	50	18.1	6.67	1902	0.91	9.7	106.2	55.7
1405	0.100	16.27	50	18.1	6.67	1903	0.89	9.5	103.7	54.4

10·20·20

CH

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1405	0.100	16.27	50	18.1	6.67	1903	0.89	9.5	103.7	54.4

Additional Purge/Sample Data

Total Volume Purged (gal):	2.5	Ambient Air Temperature (°F):	79°		
Sample Time (CT):	1405	Pump Duration (mins) - i.e., total time pump ran during sample collection	90	Color/ Odor	Cloudy/No Odor
Final DTW (ft BTOC):	16.42	Final Turbidity: 21.7	Filter Type and Size: Disposable 0.45 µm	Pump Used:	MP-50-46711 Bladder 703723

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10·20·20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 10·20·20 Sheet 2 of 2

Well ID: GAF440 U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 10·20·20 CMS

Pump Settings (ID & psi or mV): #103, 30 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 10·20·20 CMS

10·20·20 CMS

Sample ID: GAFGW440 U 10202020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1415

Time (CT) last sample bottle placed on ice: 1535

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 700-1725

Samples collected for the following analysis:

☑ Metals ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry ☑ Ra-226/Ra-228

☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, Sulfide, TKN, Nitrate/Nitrite

Bottles/Analysis (Preservative): ~~General Comments/Observations~~: 1-500mL PO_4 (sulfuric), 1-500mL TDS, 2-1LTSS, 1-250mL sulfide (ZN Oxide) 2-1L Radium (nitric), 2-1L Radium-dis (nitric), 1-250mL Metals (nitric), 1-250mL Metals-dis (nitric) 1-250mL TKN (sulfuric), 1-250mL nitrate/nitrite (sulfuric), 1-250 gen.chem/anions, 2-40mL VOAs TOC (sulfuric)

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10·20·20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02

Groundwater Sampling Form (GWSF) Date: 10/22/20 Sheet 1 of 2

Well ID:	GAF-491V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	43 to 53	Initial Depth to Water (ft BTOC):	13.98	Total Depth (ft BTOC):	53
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL / JM / AECOM / SAMPLING PAPERWORK NEILS HEDWER / NH / AECOM / SAMPLING SETUP							Start Purge Time (CT):	1119

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or <5
1120	0.100	14.23	48	22.6	3.67	6528	2.72	27.2	180.4	166
1125	0.100	14.83	48	22.3	3.74	6516	0.63	6.3	182.3	198
1130	0.100	15.78	48	22.0	3.82	6516	0.50	5.0	176.1	221
1135	0.100	16.61	48	21.7	3.82	6541	0.31	3.1	178.7	299
1140	0.100	17.15	48	21.9	3.78	6552	0.28	2.8	181.0	249
1145	0.100	17.50	48	21.6	3.76	6557	0.23	2.3	186.1	192
1150	0.100	17.96	48	21.6	3.74	6568	0.21	2.1	190.9	142
1155	0.100	18.31	48	21.5	3.77	6627	0.20	2.0	194.4	147
1200	0.100	18.72	48	21.6	3.76	6672	0.19	1.9	196.1	150

10/22 JM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1205	0.100	19.13	48	21.6	3.74	6717	0.18	1.8	198.8	154

Additional Purge/Sample Data

Total Volume Purged (gal):	~1.5 gal	Ambient Air Temperature (°F):	70°		
Sample Time (CT):	1205	Pump Duration (mins) - i.e., total time pump ran during sample collection	1hr 15min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	29.61	Final Turbidity: 504	Filter Type and Size: 0.45	Pump Used:	MP50: 2108 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/22/20

Reviewed by: ____ Signature: ____ Date: ____

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 10/22/20 Sheet 2 of 2

Well ID: GAF-441U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 10/22 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 30 10/22 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 10/22 JM

Sample ID: GAF-GW-441U-10222020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: AZ037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1210

Time (CT) last sample bottle placed on ice: 1420

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20201022_JLM 10/22 JM

General Comments/Observations: 10/22/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/22/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.01
Groundwater Sampling Form (GWSF) Date: 10/20/20 Sheet 1 of 2

Well ID:	GAF-442V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	62 to 73	Initial Depth to Water (ft BTOC):	44.13	Total Depth (ft BTOC):	73
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK NEILS HEDVER/NH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	1223

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1225	0.100	44.62	67	20.0	6.40	2435	1.32	13.2	32.7	151
1230	0.100	44.80	67	19.8	6.38	2423	0.57	5.7	22.6	124
1235	0.100	45.51	67	19.6	6.36	2412	0.46	4.6	10.6	153
1240	0.100	46.24	67	19.6	6.35	2403	0.41	4.1	6.7	67.6
1245	0.100	46.96	67	19.6	6.35	2389	0.37	3.7	4.2	46.9
1250	0.100	47.68	67	19.6	6.34	2377	0.34	3.4	2.3	43.2
1255	0.100	48.46	67	19.5	6.33	2369	0.32	3.2	-1.2	48.2
1300	0.100	48.94	67	19.4	6.32	2356	0.30	3.0	-3.6	50.9
1305	0.100	49.62	67	19.3	6.32	2346	0.30	3.0	-6.6	52.3

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1310	0.100	50.08	67	19.2	6.33	2342	0.29	2.9	-7.5	53.9

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	70°		
Sample Time (CT):	1310	Pump Duration (mins) - i.e., total time pump ran during sample collection	1hr 40min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	59.32	Final Turbidity:	39.8	Filter Type and Size:	0.45	Pump Used:	MASD: 2108 PUMP: 24846

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/20/20
Reviewed by: Signature: Date:

60627477.01

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 10/20/20 Sheet 2 of 2

Well ID: GAF-442U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 10/20 JM

Pump Settings (ID & psi or mV): ID: 103 PSI: 30 10/20 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 10/20 JM

Sample ID: GAF-GW-442U-10202020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: AZ073

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1315

Time (CT) last sample bottle placed on ice: 1450

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# 311

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20201020_JLM 10/20 JM

General Comments/Observations: GAF-AQ-900A-10202020 AND GAFAQ-901A-10202020 COLLECTED AT 1330 USING TA SUPPIED DI WATER ON 10/16/20 10/20 JM

10/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/20/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~

Groundwater Sampling Form (GWSF) Date: 10.22.20 Sheet 1 of 2

Well ID:	GAF444U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	53 to 63	Initial Depth to Water (ft BTOC):	36.65	Total Depth (ft BTOC):	63
Sample Team Members: Name/Affiliation/Initials:	Charlie Howard/AECOM/CH; Vann Turner/AECOM/VT							Start Purge Time (CT):	1210

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1220	0.100	37.81	58	21.3	4.35	2997	7.10	80.8	240.1	496
1225	0.100	37.99	58	22.8	4.20	2963	5.09	60.0	229.1	232
1230	0.100	38.24	58	23.1	4.33	2978	4.91	59.0	227.2	188
1235	0.100	38.79	58	23.7	4.52	3003	4.54	54.0	226.6	147
1240	0.100	39.23	58	23.6	4.88	2999	4.35	51.8	225.1	132
1245	0.100	39.79	58	23.5	4.14	3006	4.14	49.2	223.5	87
1250	0.100	40.26	58	22.9	4.19	3015	4.89	57.0	223.0	52.1
1255	0.100	40.74	58	23.0	4.16	3001	2.47	29.4	222.7	53.2
1300	0.100	41.22	58	23.4	4.17	2999	2.64	31.3	222.1	55.6

10 min 22 sec 20

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1300	0.100	41.22	58	23.4	4.17	2999	2.64	31.3	222.1	55.6

Additional Purge/Sample Data

Total Volume Purged (gal):	1.5			Ambient Air Temperature (°F):	84		
Sample Time (CT):	1300	Pump Duration (mins) - i.e., total time pump ran during sample collection	90			Color/ Odor	Cloudy/NA
Final DTW (ft BTOC):	45.32	Final Turbidity:	50.1	Filter Type and Size:	Disposable 0.45 µm	Pump Used:	MP-50-46711 Bladder - 903723

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10.22.20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 10·22·20 Sheet 2 of 2

Well ID: GAF 444U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 10·22·20 CHO

Pump Settings (ID & psi or mV): #103, 30 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 10·22·20 CHO

10·22·20 CHO

Sample ID: GAFGW444U10222020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1310

Time (CT) last sample bottle placed on ice: 1445

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 700-1725

Samples collected for the following analysis:

☑ Metals ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry ☑ Ra-226/Ra-228

☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, Sulfide, TKN, Nitrate/Nitrite

Bottles/Analysis (Preservative): ~~General Comments/Observations~~: 1-500mL PO_4 (sulfuric), 1-500mL TDS, 2-1LTSS, 1-250mL sulfide (Zn Oxide) 2-1L Radium (nitric), 2-1L Radium-dis (nitric), 1-250mL Metals (nitric), 1-250mL Metals-dis (nitric) 1-250mL TKN (sulfuric), 1-250mL nitrate/nitrite (sulfuric), 1-250 gen.chem/anions, 2-40mL VOAs TOC (sulfuric)

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10·22·20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02

Groundwater Sampling Form (GWSF) Date: 10/19/20 Sheet 1 of 2

Well ID:	GAF-447U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	11.6 to 16.6	Initial Depth to Water (ft BTOC):	7.13	Total Depth (ft BTOC):	16.6
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL / JM / AECOM / SAMPLING PAPERWORK NEILS HEDWER / NH / AECOM / SAMPLING SETUP							Start Purge Time (CT):	0954

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
			Stabilization Criteria:	+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0955	0.100	7.15	14	18.6	6.38	2518	2.99	29.9	182.2	55.8
1000	0.100	7.71	14	18.4	6.39	2513	1.41	14.1	166.3	52.3
1005	0.100	8.03	14	18.4	6.36	2510	1.40	14.0	145.6	48.6
1010	0.100	8.44	14	18.4	6.36	2507	1.38	13.8	129.0	43.6
1015	0.100	8.76	14	18.5	6.35	2483	1.42	14.2	113.2	41.2

10/19/20 JM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1020	0.100	9.11	14	18.6	6.35	2476	1.65	16.5	103.9	38.4

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	70°
Sample Time (CT):	1020	Pump Duration (mins) - i.e., total time pump ran during sample collection: 1hr 35min	Color/Odor: TRANSLUCENT
Final DTW (ft BTOC):	11.42	Final Turbidity: 19.2 / Filter Type and Size: 0.45	Pump Used: MP-50: 2108 PUMP: 29846

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/19/20

Reviewed by: ____ Signature: ____ Date: ____

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 10/19/20 Sheet 2 of 2

Well ID: GAF-447U

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 10/19 JM

Pump Settings (ID & psi or mV): ID:103 PSI:15 10/19 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 10/19 JM

Sample ID: GAF-GW-447U-1019 2020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: AZ073

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 1025

Time (CT) last sample bottle placed on ice: 1155

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☒ Yes ☐ No

If yes, Lot# 311

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20201019_JLM 10/19 JM

General Comments/Observations: 10/19/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/19/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~

Groundwater Sampling Form (GWSF) Date: 10·19·20 Sheet 1 of 2

Well ID:	GAF 448U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	38 to 53	Initial Depth to Water (ft BTOC):	15.47	Total Depth (ft BTOC):	53
Sample Team Members: Name/Affiliation/Initials:	Charlie Howard/AECOM/CH; Vann Turner/AECOM/VT							Start Purge Time (CT):	1445

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1455	0.100	14.94	45	20.7	6.65	1492	1.04	11.6	-58.5	90.5
1500	0.100	16.30	45	20.4	6.62	1491	0.75	8.3	-70.9	260
1505	0.100	17.30	45	20.3	6.61	1484	0.56	6.2	-79.4	331
1510	0.100	17.63	45	20.2	6.61	1478	0.49	5.4	-83.0	331
1515	0.100	18.43	45	20.1	6.62	1472	0.47	5.1	-85.1	369
1520	0.100	19.70	45	19.9	6.63	1465	0.47	5.3	-86.2	374
1525	0.100	20.21	45	19.9	6.62	1461	0.44	5.0	-88.1	388

10·19·20 CH

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1525	0.100	20.21	45	19.9	6.62	1461	0.44	5.0	-88.1	388

Additional Purge/Sample Data

Total Volume Purged (gal):	0.5			Ambient Air Temperature (°F):	75°		
Sample Time (CT):	1525	Pump Duration (mins) - i.e., total time pump ran during sample collection		90	Color/ Odor	Opague/No Odor	
Final DTW (ft BTOC):	34.75	Final Turbidity:	77.2	Filter Type and Size:	Disposable 0.45 µm	Pump Used:	MP-50-46711 Bladder 703723

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10·19·20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 10·19·20 Sheet 2 of 2

Well ID: GAF448U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 10·19·20 CHO

Pump Settings (ID & psi or mV): #103, 25 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 10·19·20 CHO

10·19·20 CHO

Sample ID: GAFGW448U 10192020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1535

Time (CT) last sample bottle placed on ice: 1645

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 700-1725

Samples collected for the following analysis:

☑ Metals ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry ☑ Ra-226/Ra-228

☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, Sulfide, TKN, Nitrate/Nitrite

Bottles/Analysis (Preservative): ~~General Comments/Observations~~: 1-500mL PO_4 (sulfuric), 1-500mL TDS, 2-1LTSS, 1-250mL sulfide (ZN Oxide) 2-1L Radium (nitric), 2-1L Radium-dis (nitric), 1-250mL Metals (nitric), 1-250mL Metals-dis (nitric) 1-250mL TKN (sulfuric), 1-250mL nitrate/nitrite (sulfuric), 1-250 gen.chem/anions, 2-40mL VOAs TOC (sulfuric)

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10·19·20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~

Groundwater Sampling Form (GWSF) Date: 10.22.20 Sheet 1 of 2

Well ID:	GAF489U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	47 to 57	Initial Depth to Water (ft BTOC):	15.04	Total Depth (ft BTOC):	57
Sample Team Members: Name/Affiliation/Initials:	Charlie Howard/AECOM/CH; Vann Turner /AECOM/VT							Start Purge Time (CT):	0730

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0745	0.100	16.45	52	15.9	6.50	113.9	6.37	64.7	156.8	992
0750	0.100	17.91	52	15.9	6.42	111.2	5.51	58.2	154.9	>1000
0755	0.100	18.77	52	16.0	6.33	108.7	4.99	51.1	155.2	>1000
0800	0.100	19.74	52	15.9	6.18	105.7	4.83	48.8	155.3	>1000
0805	0.100	20.03	52	16.0	6.09	104.9	4.84	48.7	156.1	>1000
0810	0.100	20.81	52	16.0	6.01	103.2	4.84	49.1	156.2	>1000
0815	0.100	21.16	52	16.1	5.98	102.6	4.85	49.3	156.3	807
0820	0.100	21.61	52	16.1	5.97	101.2	4.51	46.3	157.1	602
0825	0.100	22.1	52	16.1	5.96	95.6	4.44	45.3	157.4	342
0830	0.100	22.51	52	16.2	5.95	91.9	4.34	44.0	158.4	222
0835	0.100	22.79	52	16.2	5.91	88.8	4.32	43.4	158.8	172
0840	0.100	23.26	52	16.2	5.86	85.3	4.30	43.8	159.1	145
0845	0.100	23.49	52	16.3	5.84	83.2	4.22	42.9	159.9	101
0850	0.100	23.91	52	16.3	5.83	82.9	4.11	41.6	160.1	94.3
0855	0.100	24.13	52	16.3	5.82	82.2	4.00	40.7	160.5	87.3
0900	0.100	24.61	52	16.3	5.78	82.4	3.96	40.4	161.6	67.2
0905	0.100	24.92	52	16.4	5.80	83.3	3.82	39.1	161.3	64.2
0910	0.100	25.13	52	16.4	5.80	83.8	3.80	38.7	162.3	65.9
0915	0.100	25.53	52	16.4	5.80	84.2	3.79	38.3	162.1	68.7

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0915	0.100	25.53	52	16.4	5.80	84.2	3.79	38.3	162.1	68.7

Additional Purge/Sample Data

Total Volume Purged (gal):	2			Ambient Air Temperature (°F):	62		
Sample Time (CT):	0915	Pump Duration (mins) - i.e., total time pump ran during sample collection	240			Color/ Odor	Clear/NA
Final DTW (ft BTOC):	36.16	Final Turbidity:	15.20	Filter Type and Size:	Disposable 0.45 µm	Pump Used:	MP-50-46771 Bladder - 903723

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10.22.20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 10·22·20 Sheet 2 of 2

Well ID: GAF 489U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 10·22·20 CHO

Pump Settings (ID & psi or mV): #103, 30 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 10·22·20 CHO

10·22·20 CHO

Sample ID: GAFGW489U 10222020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 0945

Time (CT) last sample bottle placed on ice: 1145

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 700-1725

Samples collected for the following analysis:

☑ Metals ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry ☑ Ra-226/Ra-228

☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO4, Sulfide, TKN, Nitrate/Nitrite

Bottles/Analysis (Preservative): ~~General Comments/Observations~~: 1-500mL PO4 (sulfuric), 1-500mL TDS, 2-1L TSS, 1-250mL sulfide (ZN Oxide) 2-1L Radium (nitric), 2-1L Radium-dis (nitric), 1-250mL Metals (nitric), 1-250mL Metals-dis (nitric) 1-250mL TKN (sulfuric), 1-250mL nitrate/nitrite (sulfuric), 1-250 gen.chem/anions, 2-40mL voas TOC (sulfuric)

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10·22·20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~

Groundwater Sampling Form (GWSF) Date: 10·19·20 Sheet 1 of 2

Well ID:	GAF 526V	Well Diameter (in):	2	Screen Inteval (ft BTOC):	63 to 68	Initial Depth to Water (ft BTOC):	22.50	Total Depth (ft BTOC):	68
Sample Team Members: Name/Affiliation/Initials:	Charlie Howard/AECOM/CH; Vann Turner/AECOM/VT							Start Purge Time (CT):	1105

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
1110	0.100	22.50	65	25.3	9.24	887	8.59	93.0	151.1	4.42
1115	0.100	23.26	65	18.3	7.63	1541	2.30	24.6	-15.3	7.06
1120	0.100	23.92	65	17.9	7.37	1545	0.75	8.0	-14.6	5.17
1125	0.100	24.26	65	17.9	7.25	1546	0.83	8.7	-9.5	5.12
1130	0.100	24.74	65	17.7	7.19	1539	2.52	26.7	-6.6	2.99
1135	0.100	25.28	65	17.7	7.15	1533	0.72	7.6	-4.5	3.12
1140	0.100	25.54	65	17.7	7.14	1532	0.61	6.3	-3.7	2.56
1145	0.100	25.91	65	17.6	7.14	1527	0.66	6.9	-3.1	2.05
1150	0.100	26.41	65	17.7	7.14	1527	0.63	6.7	-2.5	2.22

10·19·20

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
1150	0.100	26.41	65	17.7	7.14	1527	0.63	6.7	-2.5	2.22

Additional Purge/Sample Data

Total Volume Purged (gal):	1.0			Ambient Air Temperature (°F):	70°F		
Sample Time (CT):	1150	Pump Duration (mins) - i.e., total time pump ran during sample collection	110			Color/ Odor	Clear/Sulfur Smell
Final DTW (ft BTOC):	27.67	Final Turbidity:	4.80	Filter Type and Size:	Disposable 0.45 µm	Pump Used:	MP-50-46711 Bladder 703723

Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10·19·20

Reviewed by: _____ Signature: _____ Date: _____

Project/Site: TVA Gallatin Fossil Plant Job Number: ~~60566620~~
Groundwater Sampling Form (GWSF) Date: 10·19·20 Sheet 2 of 2

Well ID: GAF 526U

Well Purging Method Used: ☑ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = 10·19·20 CHO

Pump Settings (ID & psi or mV): #105, 35 psi

Stability reached? ☑ Yes ☐ No

If no, provide explanation: 10·19·20 CHO

10·19·20 CHO

Sample ID: GAFGW526U 10192020

☐ Unfiltered ☐ Filtered ☑ Both

Filter ID: A2073

MS/MSD collected? ☐ Yes ☑ No

Field duplicate collected? ☐ Yes ☑ No Field Duplicate ID: NA

Field Duplicate Sample Time (CT): NA

Time (CT) first sample bottle placed on ice: 1200

Time (CT) last sample bottle placed on ice: 1350

Heavy equipment in area? ☐ Yes ☑ No

Was non-dedicated tubing used? ☑ Yes ☐ No

If yes, Lot# 700-1725

Samples collected for the following analysis:

☑ Metals ☑ Dissolved Metals ☑ TSS ☑ TDS ☑ Anions ☑ General Chemistry ☑ Ra-226/Ra-228

☑ Dissolved Ra-226/Ra-228 ☑ TOC ☑ Other PO_4, Sulfide, TKN, Nitrate/Nitrite

Bottles/Analysis (Preservative): ~~General Comments/Observations~~: 1-500mL PO_4 (sulfuric), 1-500mL TDS, 2-1L TSS, 1-250mL sulfide (ZN Oxide) 2-1L Radium (nitric), 2-1L Radium-dis (nitric), 1-250mL Metals (nitric), 1-250mL Metals-dis (nitric) 1-250mL TKN (sulfuric), 1-250mL nitrate/nitrite (sulfuric), 1-250 gen.chem/anions, 2-40mL VOAs TOC (sulfuric)

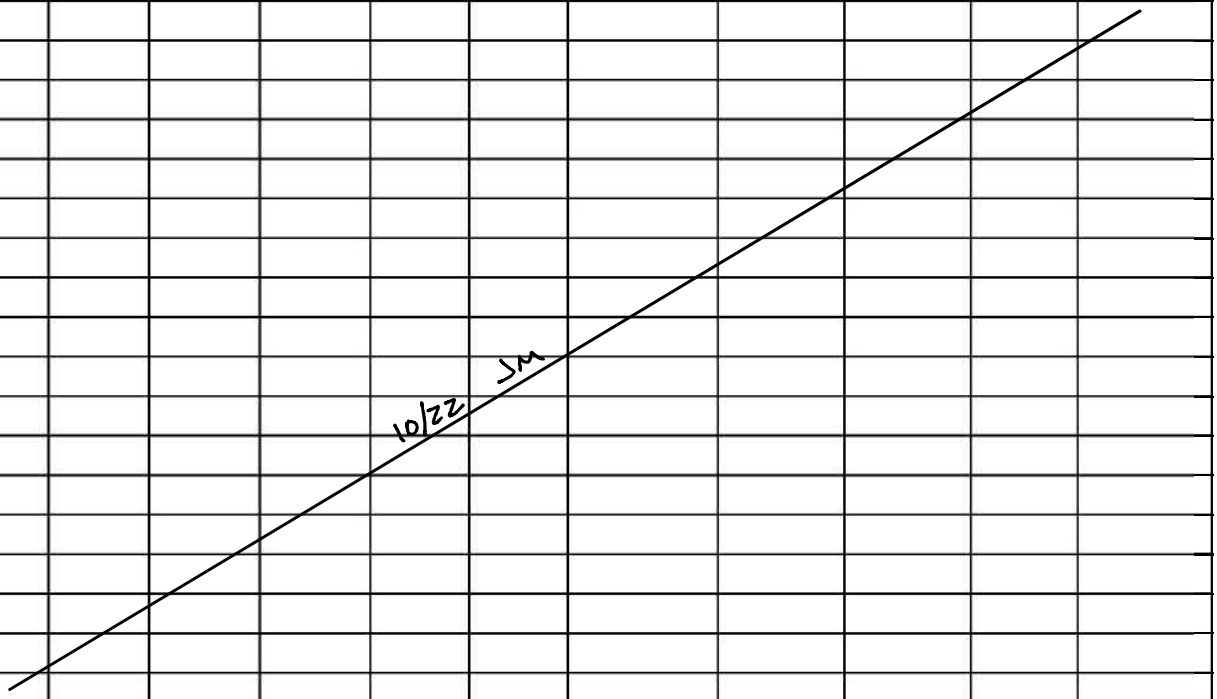
Sampler Name: Charlie Howard Signature: Charlie Howard Date: 10·19·20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02
Groundwater Sampling Form (GWSF) Date: 10/22/20 Sheet 1 of 2

Well ID:	GAF-541U	Well Diameter (in):	2	Screen Inteval (ft BTOC):	53 to 63	Initial Depth to Water (ft BTOC):	14.77	Total Depth (ft BTOC):	63
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL/JM/AECOM/SAMPLING PAPERWORK NEILS HEDVER/NH/AECOM/SAMPLING SETUP							Start Purge Time (CT):	0910

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
Stabilization Criteria:				+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0915	0.100	14.56	58	20.2	6.05	3523	1.19	11.9	68.8	13.1
0920	0.100	15.16	58	20.3	6.04	3817	0.46	4.6	-6.1	9.71
0925	0.100	15.85	58	20.3	6.02	3934	0.38	3.8	-12.3	7.62
0930	0.100	16.51	58	20.4	6.03	3976	0.34	3.4	-23.9	5.03
0935	0.100	17.11	58	20.4	6.04	3999	0.30	3.0	-38.4	4.62
0940	0.100	17.74	58	20.4	6.04	4009	0.28	2.8	-49.2	4.51



Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0945	0.100	18.40	58	20.4	6.05	4016	0.26	2.6	-57.8	4.96

Additional Purge/Sample Data

Total Volume Purged (gal):	~1 gal	Ambient Air Temperature (°F):	70°		
Sample Time (CT):	0945	Pump Duration (mins) - i.e., total time pump ran during sample collection	1hr 20min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	27.89	Final Turbidity:	4.89	Filter Type and Size:	N/A	Pump Used:	MP50 : 2108 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/22/20
Reviewed by: Signature: Date:

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 10/22/20 Sheet 2 of 2

Well ID: GAF-541V

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 10/22 JM

Pump Settings (ID & psi or mV): ID:102 PSI:35 10/22 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 10/22 JM

Sample ID: GAF-GW-541V-10222020

☒ Unfiltered ☐ Filtered ☐ Both

Filter ID: N/A

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0950

Time (CT) last sample bottle placed on ice: 1110

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF_DRE_20201022_JLM 10/22JM

General Comments/Observations: 10/22/20 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/22/20
Reviewed by: Signature: Date:

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted] 60627477.02

Groundwater Sampling Form (GWSF) Date: 10/22/20 Sheet 1 of 2

Well ID:	S3	Well Diameter (in):	2	Screen Inteval (ft BTOC):	51 to 61	Initial Depth to Water (ft BTOC):	27.25	Total Depth (ft BTOC):	61
Sample Team Members: Name/Affiliation/Initials:	JONATHAN MOSKAL / JM / AECOM / SAMPLING PAPERWORK NEILS HEDNER / NH / AECOM / SAMPLING SETUP							Start Purge Time (CT):	0725

Water Quality Observations

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
			Stabilization Criteria:	+/- 0.2	+/- 0.1	+/- 5%	Below 0.5 mg/L or +/- 10%		NA	+/- 10% or < 5
0730	0.450	27.63	56	16.3	4.01	2367	0.65	6.5	112.4	135
0735	0.450	27.91	56	16.2	3.96	2341	0.52	5.2	111.1	96.1
0740	0.450	28.25	56	16.1	3.91	2303	0.45	4.5	109.6	42.9
0745	0.450	28.56	56	16.2	3.91	2282	0.37	3.7	112.2	14.3
0750	0.450	28.91	56	16.1	3.99	2261	0.31	3.1	116.9	9.17
0755	0.450	29.10	56	16.1	4.07	2245	0.26	2.6	121.2	10.3
0800	0.450	29.12	56	16.1	4.17	2236	0.20	2.0	128.7	11.6

10/23/20 JM

Sample Readings

Time (CT)	Pump Rate (L/min)	Depth to Water (ft BTOC)	Pump Depth (ft BTOC)	Temp (°C)	pH (s.u.)	Specific Conductance (µS/cm)	DO (mg/L)	DO (%)	ORP (mV)	Turbidity (NTU)
0805	0.450	29.10	56	16.1	4.06	2233	0.21	2.1	131.8	12.1

Additional Purge/Sample Data

Total Volume Purged (gal):	~5 gal	Ambient Air Temperature (°F):	70°		
Sample Time (CT):	0805	Pump Duration (mins) - i.e., total time pump ran during sample collection	40 min	Color/ Odor	TRANSLUCENT
Final DTW (ft BTOC):	29.09	Final Turbidity: 7.17	Filter Type and Size: 0.45	Pump Used:	MP50: 2108 PUMP: DEDICATED

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/22/20

Reviewed by: ___ Signature: ___ Date: ___

60627477.02

Project/Site: TVA Gallatin Fossil Plant Job Number: [redacted]
Groundwater Sampling Form (GWSF) Date: 10/22/20 Sheet 2 of 2

Well ID: GAF-53

Well Purging Method Used: ☒ Low Flow ☐ Bailer ☐ Volume-Averaged

If volume-averaged, 3 well volumes = N/A 10/22 JM

Pump Settings (ID & psi or mV): ID:103 PSI:80 10/22 JM

Stability reached? ☒ Yes ☐ No

If no, provide explanation: 10/22 JM

Sample ID: GAF-GW-53-10222020

☐ Unfiltered ☐ Filtered ☒ Both

Filter ID: AZ037

MS/MSD collected? ☐ Yes ☒ No

Field duplicate collected? ☐ Yes ☒ No Field Duplicate ID: N/A

Field Duplicate Sample Time (CT): N/A

Time (CT) first sample bottle placed on ice: 0810

Time (CT) last sample bottle placed on ice: 0845

Heavy equipment in area? ☐ Yes ☒ No

Was non-dedicated tubing used? ☐ Yes ☒ No

If yes, Lot# N/A

Samples collected for the following analysis:

☒ Metals ☒ Dissolved Metals ☒ TSS ☒ TDS ☒ Anions ☒ General Chemistry ☒ Ra-226/Ra-228

☒ Dissolved Ra-226/Ra-228 ☒ TOC ☒ Other REFER TO GAF-DRE-20201022-JLM 10/22JM

General Comments/Observations: GAF-AQ-900A-10222020 COLLECTED AT 0800 AND GAF-AQ-901A-10222020 AT 0820 USING TA SUPPIED DI WATER ON 10/16/20 10/22 JM

10/22 JM

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 10/22/20
Reviewed by: Signature: Date:

HACH Kit Well Sampling Field Sheets

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/15/20

Location ID: 19R Sample Depth (ft bgs): 47.5

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	17.0	
pH (S.U.)	3.58	
Dissolved Oxygen (mg/L)	2.23	
Dissolved Oxygen (%)	23.0	
ORP (mv)	247.3	
Turbidity (NTU)	16.8 / 7.07 (filtered)	
Aerated pH (S.U.)	3.58	
Dissolved carbon dioxide (mg/L)	100	100
Ferrous iron (Fe[II]) (mg/L)	7.0	5.5
Sulfide (mg/L)	———	———

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/15/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/16/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/16/20

Location ID: 20 Sample Depth (ft bgs): 50

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	15.3	
pH (S.U.)	6.19	
Dissolved Oxygen (mg/L)	0.45	
Dissolved Oxygen (%)	4.5	
ORP (mv)	22.8	
Turbidity (NTU)	3.32/2.14 (filtered)	
Aerated pH (S.U.)	6.35	
Dissolved carbon dioxide (mg/L)	25	35
Ferrous iron (Fe[II]) (mg/L)	4.5	2.5
Sulfide (mg/L)		

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/16/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/16/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/16/20

Location ID: 22 Sample Depth (ft bgs): 47

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	17.2	
pH (S.U.)	7.50	
Dissolved Oxygen (mg/L)	3.92	
Dissolved Oxygen (%)	39.2	
ORP (mv)	100.6	
Turbidity (NTU)	4.96 / 3.74 (filtered)	
Aerated pH (S.U.)	7.46	
Dissolved carbon dioxide (mg/L)	12.5	12
Ferrous iron (Fe[II]) (mg/L)	0	0
Sulfide (mg/L)	———	———

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/16/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/16/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/21/20

Location ID: GAF-439U Sample Depth (ft bgs): 35

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	12.5	
pH (S.U.)	6.89	
Dissolved Oxygen (mg/L)	0.44	
Dissolved Oxygen (%)	4.4	
ORP (mv)	-84.9	
Turbidity (NTU)	542/20.9 (filtered)	
Aerated pH (S.U.)	6.95/7 pH STRIP	
Dissolved carbon dioxide (mg/L)	12.5	9
Ferrous iron (Fe[II]) (mg/L)	6	5
Sulfide (mg/L)	———	———

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/21/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/21/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/17/20

Location ID: GAF440V Sample Depth (ft bgs): 49

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	12.2	
pH (S.U.)	6.70	
Dissolved Oxygen (mg/L)	1.27	
Dissolved Oxygen (%)	12.7	
ORP (mv)	141.9	
Turbidity (NTU)	240/113 (filtered)	
Aerated pH (S.U.)	6.78	
Dissolved carbon dioxide (mg/L)	62.5	68.75
Ferrous iron (Fe[II]) (mg/L)	0.5	0.5
Sulfide (mg/L)		

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/17/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/17/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/16/20

Location ID: 44IV Sample Depth (ft bgs): 47

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	18.5	
pH (S.U.)	3.50	
Dissolved Oxygen (mg/L)	0.44	
Dissolved Oxygen (%)	4.4	
ORP (mv)	230.1	
Turbidity (NTU)	149/10.2 (filtered)	
Aerated pH (S.U.)	3.62	
Dissolved carbon dioxide (mg/L)	100	100
Ferrous iron (Fe[II]) (mg/L)	7	7
Sulfide (mg/L)	———	———

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/16/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/16/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/17/20

Location ID: GAF442V Sample Depth (ft bgs): 67

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	14.8	
pH (S.U.)	6.52	
Dissolved Oxygen (mg/L)	0.47	
Dissolved Oxygen (%)	4.7	
ORP (mv)	-6.2	
Turbidity (NTU)	111 / 27.8 (filtered)	
Aerated pH (S.U.)	6.57	
Dissolved carbon dioxide (mg/L)	6.25	5
Ferrous iron (Fe[II]) (mg/L)	3	2.5
Sulfide (mg/L)	_____	_____

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/17/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/17/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/20/20

Location ID: GAF-444U Sample Depth (ft bgs): 58

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	15.1	
pH (S.U.)	4.13	
Dissolved Oxygen (mg/L)	0.43	
Dissolved Oxygen (%)	4.3	
ORP (mv)	292.6	
Turbidity (NTU)	9.97/6.21 (filtered)	
Aerated pH (S.U.)	4.13/5 pH STRIP	
Dissolved carbon dioxide (mg/L)	25	20
Ferrous iron (Fe[II]) (mg/L)	3	2
Sulfide (mg/L)	———	———

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/20/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/20/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/21/20

Location ID: GAF-447U Sample Depth (ft bgs): 14

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	11.4	
pH (S.U.)	6.53	
Dissolved Oxygen (mg/L)	0.99	
Dissolved Oxygen (%)	9.9	
ORP (mv)	70.0	
Turbidity (NTU)	137 / 34.2 (filtered)	
Aerated pH (S.U.)	6.62 / 7 pH STRIP	
Dissolved carbon dioxide (mg/L)	5	3.75
Ferrous iron (Fe[II]) (mg/L)	5	4.5
Sulfide (mg/L)	———	———

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/21/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/21/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/20/20

Location ID: GAF-448U Sample Depth (ft bgs): 45

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	15.1	
pH (S.U.)	6.93	
Dissolved Oxygen (mg/L)	0.33	
Dissolved Oxygen (%)	3.3	
ORP (mv)	-123.9	
Turbidity (NTU)	48.5/ (filtered)	
Aerated pH (S.U.)	6.93/7 pH STRIP	
Dissolved carbon dioxide (mg/L)	25	25
Ferrous iron (Fe[II]) (mg/L)	5	5
Sulfide (mg/L)	———	———

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/20/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/20/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/21/20

Location ID: GAF-489U Sample Depth (ft bgs): 52

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

1035 0.100 16.31 52 13.2 6.11 48.7 1.96 19.6 171.5 17.8

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	13.2	
pH (S.U.)	6.11	
Dissolved Oxygen (mg/L)	1.96	
Dissolved Oxygen (%)	19.6	
ORP (mv)	171.5	
Turbidity (NTU)	17.8/4.15 (filtered)	
Aerated pH (S.U.)	6.21 / 7 pH STRIP	
Dissolved carbon dioxide (mg/L)	6.25	5
Ferrous iron (Fe[II]) (mg/L)	0	0
Sulfide (mg/L)	———	———

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/21/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/21/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 1/20/20

Location ID: GAF-S3 Sample Depth (ft bgs): 56

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [ ] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	9.0	
pH (S.U.)	3.80	
Dissolved Oxygen (mg/L)	0.39	
Dissolved Oxygen (%)	3.9	
ORP (mv)	25.14	
Turbidity (NTU)	122/8.73 (filtered)	
Aerated pH (S.U.)	4.35/5 pH STRIP	
Dissolved carbon dioxide (mg/L)	50	50
Ferrous iron (Fe[II]) (mg/L)	5.5	5
Sulfide (mg/L)		

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 1/20/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 1/20/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 2/13/20

Location ID: GAF-4444 Sample Depth (ft bgs): 57

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model ProPlus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	14.2	
pH (S.U.)	3.94	
Dissolved Oxygen (mg/L)	0.74	
Dissolved Oxygen (%)	7.5	
ORP (mv)	230.3	
Turbidity (NTU)	10.6	
Aerated pH (S.U.)	3.94	
Dissolved carbon dioxide (mg/L)	100	N/A
Ferrous iron (Fe[II]) (mg/L)	5.5	N/A
Sulfide (mg/L)	>2.00	N/A

Sampler Name: CHARLIE HOWARD Signature: CHH Date: 2/13/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 2/17/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 3/18/20

Location ID: GAF-19R Sample Depth (ft bgs): 47.5

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [ ] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	15.5	
pH (S.U.)	3.44	
Dissolved Oxygen (mg/L)	0.10	
Dissolved Oxygen (%)	1.0	
ORP (mv)	312.9	
Turbidity (NTU)	55.2 / 10.9 (filtered)	
Aerated pH (S.U.)	3.45 / 3 pH STRIP	
Dissolved carbon dioxide (mg/L)	30	———
Ferrous iron (Fe[II]) (mg/L)	6.5	———
Sulfide (mg/L)	0	———

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 3/18/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 3/ /20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 3/17/20

Location ID: GAF-441U Sample Depth (ft bgs): 58

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [ ] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	15.30	
pH (S.U.)	3.57	
Dissolved Oxygen (mg/L)	0.45	
Dissolved Oxygen (%)	4.5	
ORP (mv)	266.9	
Turbidity (NTU)	470 / 220 (filtered)	
Aerated pH (S.U.)	3.49 / 4 pH STRIP	
Dissolved carbon dioxide (mg/L)	100	———
Ferrous iron (Fe[II]) (mg/L)	32	———
Sulfide (mg/L)	0	———

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 3/17/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 3/ /20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 3/17/20

Location ID: GAF-444U Sample Depth (ft bgs): 48

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [ ] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [x] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	16.4	
pH (S.U.)	3.84	
Dissolved Oxygen (mg/L)	7.41	
Dissolved Oxygen (%)	74.1	
ORP (mv)	259.2	
Turbidity (NTU)	224 / 80 (filtered)	
Aerated pH (S.U.)	3.81 / 4 pH STRIP	
Dissolved carbon dioxide (mg/L)	25	———
Ferrous iron (Fe[II]) (mg/L)	30	———
Sulfide (mg/L)	1	———

Sampler Name: JONATHAN MOSKAL Signature: Jonathan L. Moskal Date: 3/17/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 3/ /20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/22/20

Location ID: 19R Sample Depth (ft bgs): 47.5

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	05/28/20 - NOD ~~26.1~~ 15.8	
pH (S.U.)	05/28/20 - NOD ~~3.47~~ 3.49	
Dissolved Oxygen (mg/L)	05/28/20 - NOD ~~0.29~~ 0.26	
Dissolved Oxygen (%)	05/28/20 - NOD ~~2.9~~ 2.6	
ORP (mv)	05/28/20 - NOD ~~269.0~~ 257.2	
Turbidity (NTU)	05/28/20 - NOD 12.5 ~~13.8~~ / 7.02 (filtered)	
Aerated pH (S.U.)	3.47	
Dissolved carbon dioxide (mg/L)	120	120
Ferrous iron (Fe[II]) (mg/L)	7.5	5.0
Sulfide (mg/L)	10.0	10.0

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/22/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/22/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/22/20

Location ID: 20 Sample Depth (ft bgs): 50

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	05/28/20 - NOD ~~17.7~~ 16.1	
pH (S.U.)	05/28/20 - NOD ~~5.84~~ 6.04	
Dissolved Oxygen (mg/L)	05/28/20 - NOD ~~0.60~~ 0.43	
Dissolved Oxygen (%)	05/28/20 - NOD ~~6.9~~ 4.4	
ORP (mv)	05/28/20 - NOD ~~20.2~~ 6.7	
Turbidity (NTU)	05/28/20 - NOD 1.20 ~~2.59~~ 0.41 (filtered)	
Aerated pH (S.U.)	5.84	
Dissolved carbon dioxide (mg/L)	30	25
Ferrous iron (Fe[II]) (mg/L)	5.5	5
Sulfide (mg/L)	10	10

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/22/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/22/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/23/20

Location ID: 22 Sample Depth (ft bgs): 47

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	05/28/20 - NOD ~~17.3~~ 17.2	
pH (S.U.)	05/28/20 - NOD ~~7.12~~ 7.08	
Dissolved Oxygen (mg/L)	05/28/20 - NOD ~~2.84~~ 1.88	
Dissolved Oxygen (%)	05/28/20 - NOD ~~29.5~~ 19.4	
ORP (mv)	05/28/20 - NOD ~~69.4~~ 74.8	
Turbidity (NTU)	05/28/20 - NOD 0.80 ~~0.53~~/0.14 (filtered)	
Aerated pH (S.U.)	7.12	
Dissolved carbon dioxide (mg/L)	11	10
Ferrous iron (Fe[II]) (mg/L)	4	3.5
Sulfide (mg/L)	2.5	1.5

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/22/20

Location ID: GAF-439U Sample Depth (ft bgs): 35

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	05/28/20 - NOD ~~17.0~~ 15.1	
pH (S.U.)	6.67	
Dissolved Oxygen (mg/L)	05/28/20 - NOD ~~0.41~~ 0.45	
Dissolved Oxygen (%)	05/28/20 - NOD ~~4.1~~ 4.5	
ORP (mv)	05/28/20 - NOD ~~-46.6~~ -76.2	
Turbidity (NTU)	05/28/20 - NOD 252 ~~371~~ / 62.5 (filtered)	
Aerated pH (S.U.)	6.67	
Dissolved carbon dioxide (mg/L)	13.0	9
Ferrous iron (Fe[II]) (mg/L)	7	5.5
Sulfide (mg/L)	8	8

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/22/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/22/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/23/20

Location ID: GAF-440U Sample Depth (ft bgs): 49

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	16.6	
pH (S.U.)	6.53	
Dissolved Oxygen (mg/L)	0.29	
Dissolved Oxygen (%)	2.9	
ORP (mv)	89	
Turbidity (NTU)	56.4 / 12.0 (filtered)	
Aerated pH (S.U.)	6.53	
Dissolved carbon dioxide (mg/L)	55	50.5
Ferrous iron (Fe[II]) (mg/L)	2.5	2.0
Sulfide (mg/L)	12	11

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/24/20

Location ID: GAF-441 U Sample Depth (ft bgs): 47

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	17.2	
pH (S.U.)	3.29	
Dissolved Oxygen (mg/L)	0.39	
Dissolved Oxygen (%)	3.9	
ORP (mv)	286.1	
Turbidity (NTU)	781 / 102 (filtered)	
Aerated pH (S.U.)	3.29	
Dissolved carbon dioxide (mg/L)	80	70
Ferrous iron (Fe[II]) (mg/L)	6	5
Sulfide (mg/L)	11	9

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/24/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/24/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/22/20

Location ID: GAF-442U Sample Depth (ft bgs): 67

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	18.3	
pH (S.U.)	6.29	
Dissolved Oxygen (mg/L)	0.41	
Dissolved Oxygen (%)	4.1	
ORP (mv)	-116.1	
Turbidity (NTU)	25 / 1.2 (filtered)	
Aerated pH (S.U.)	6.29	
Dissolved carbon dioxide (mg/L)	6.25	5
Ferrous iron (Fe[II]) (mg/L)	3	2
Sulfide (mg/L)	7	6

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/22/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/22/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/24/20

Location ID: GAF-444U Sample Depth (ft bgs): 58

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	17.5	
pH (S.U.)	4.3	
Dissolved Oxygen (mg/L)	0.33	
Dissolved Oxygen (%)	3.5	
ORP (mv)	217.3	
Turbidity (NTU)	23.7 / 5.6 (filtered)	
Aerated pH (S.U.)	4.3	
Dissolved carbon dioxide (mg/L)	30	25
Ferrous iron (Fe[II]) (mg/L)	3	2
Sulfide (mg/L)	3	2

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/24/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/24/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/23/20

Location ID: GAF-447U Sample Depth (ft bgs): 14

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	13.9	
pH (S.U.)	05/28/20 - NOD ~~6.39~~ 6.35	
Dissolved Oxygen (mg/L)	05/28/20 - NOD ~~0.51~~ 0.63	
Dissolved Oxygen (%)	05/28/20 - NOD ~~5.2~~ 6.5	
ORP (mv)	05/28/20 - NOD ~~17.5~~ 31.3	
Turbidity (NTU)	05/28/20 - NOD 206 ~~369~~/108 (filtered)	
Aerated pH (S.U.)	6.39	
Dissolved carbon dioxide (mg/L)	6.0	4.5
Ferrous iron (Fe[II]) (mg/L)	8	7
Sulfide (mg/L)	5	4.5

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/23/20

Location ID: GAF-448U Sample Depth (ft bgs): 45

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	16.8	
pH (S.U.)	6.52	
Dissolved Oxygen (mg/L)	0.11	
Dissolved Oxygen (%)	1.1	
ORP (mv)	-124.7	
Turbidity (NTU)	65.3/10.4 (filtered)	
Aerated pH (S.U.)	6.52	
Dissolved carbon dioxide (mg/L)	20	20
Ferrous iron (Fe[II]) (mg/L)	6	5
Sulfide (mg/L)	10	10

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/23/20

Location ID: GAF-489U Sample Depth (ft bgs): 52

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	15.1	
pH (S.U.)	5.75	
Dissolved Oxygen (mg/L)	3.87	
Dissolved Oxygen (%)	38.7	
ORP (mv)	175.5	
Turbidity (NTU)	28.6/10.2 (filtered)	
Aerated pH (S.U.)	5.75	
Dissolved carbon dioxide (mg/L)	6.5	6.0
Ferrous iron (Fe[II]) (mg/L)	2.5	2.5
Sulfide (mg/L)	8	7

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/23/20

Location ID: GAF-526U Sample Depth (ft bgs): 65.5

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	05/28/20 - NOD ~~15.7~~ 15.8	
pH (S.U.)	05/28/20 - NOD ~~6.8~~ 6.82	
Dissolved Oxygen (mg/L)	05/28/20 - NOD ~~0.34~~ 0.30	
Dissolved Oxygen (%)	05/28/20 - NOD ~~3.5~~ 3.0	
ORP (mv)	05/28/20 - NOD ~~-56.9~~ -65.0	
Turbidity (NTU)	05/28/20 - NOD 16.8 ~~17.1~~ / 4.4 (filtered)	
Aerated pH (S.U.)	6.8	
Dissolved carbon dioxide (mg/L)	8	8
Ferrous iron (Fe[II]) (mg/L)	7	7
Sulfide (mg/L)	7.5	7

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/24/20

Location ID: GAF-541 U Sample Depth (ft bgs): 60.5

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	18.3	
pH (S.U.)	6.04	
Dissolved Oxygen (mg/L)	0.33	
Dissolved Oxygen (%)	3.3	
ORP (mv)	-68.9	
Turbidity (NTU)	54.5 / 10.2 (filtered)	
Aerated pH (S.U.)	6.04	
Dissolved carbon dioxide (mg/L)	50	45
Ferrous iron (Fe[II]) (mg/L)	5.5	5.0
Sulfide (mg/L)	13.5	11

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/24/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/24/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 4/23/20

Location ID: S3 Sample Depth (ft bgs): 56

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model Pro Plus

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	05/28/20 - NOD ~~15.1~~ 15.4	
pH (S.U.)	05/28/20 - NOD ~~3.80~~ 3.76	
Dissolved Oxygen (mg/L)	05/28/20 - NOD ~~0.86~~ 0.34	
Dissolved Oxygen (%)	05/28/20 - NOD ~~8.5~~ 3.4	
ORP (mv)	05/28/20 - NOD ~~260.4~~ 263.5	
Turbidity (NTU)	05/28/20 - NOD 8.75 ~~17.5~~ 2.4 (filtered)	
Aerated pH (S.U.)	3.80	
Dissolved carbon dioxide (mg/L)	45	42
Ferrous iron (Fe[II]) (mg/L)	6.0	5.0
Sulfide (mg/L)	9	9

Sampler Name: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Reviewed By: SARA MEISSNER Signature: Sara Meissner Date: 4/23/20

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 6.16.20

Location ID: 19R Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make_____ Model_____

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)		
pH (S.U.)		
Dissolved Oxygen (mg/L)		
Dissolved Oxygen (%)		
ORP (mv)		
Turbidity (NTU)		
Aerated pH (S.U.)		
Dissolved carbon dioxide (mg/L)	120	
Ferrous iron (Fe[II]) (mg/L)	3.6	
Sulfide (mg/L)	0.0	

Sampler Name: _____ Signature:_____ Date: 6.16.20

Reviewed By: _____ Signature:_____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 6.17.20

Location ID: 20 Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make_____ Model_____

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)		
pH (S.U.)		
Dissolved Oxygen (mg/L)		
Dissolved Oxygen (%)		
ORP (mv)		
Turbidity (NTU)		
Aerated pH (S.U.)		
Dissolved carbon dioxide (mg/L)	185	
Ferrous iron (Fe[II]) (mg/L)	1.8	
Sulfide (mg/L)	0.0	

Sampler Name: _____ Signature:_____ Date: 6.17.20

Reviewed By: _____ Signature:_____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 6.16.20

Location ID: 22 Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make_____ Model_____

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)		
pH (S.U.)		
Dissolved Oxygen (mg/L)		
Dissolved Oxygen (%)		
ORP (mv)		
Turbidity (NTU)		
Aerated pH (S.U.)		
Dissolved carbon dioxide (mg/L)	90	
Ferrous iron (Fe[II]) (mg/L)	0.0	
Sulfide (mg/L)	0.0	

Sampler Name: _____ Signature:_____ Date: 6.16.20

Reviewed By: _____ Signature:_____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: [redacted] 60621225.01

Field Parameters and Colorimetric Field Test Kit Form Date: 6/19/20

Location ID: GAF-439U Sample Depth (ft bgs): 37.5

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model PRO PLUS

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [ ] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	17.6	
pH (S.U.)	6.60	
Dissolved Oxygen (mg/L)	0.35	
Dissolved Oxygen (%)	3.5	
ORP (mv)	-93.3	
Turbidity (NTU)	OR	
Aerated pH (S.U.)	6.65	
Dissolved carbon dioxide (mg/L)	336 mg/L	320 mg/L
Ferrous iron (Fe[II]) (mg/L)	5 mg/L	4 mg/L
Sulfide (mg/L)	0 mg/L	0 mg/L

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/19/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: [redacted] 60621225.01

Field Parameters and Colorimetric Field Test Kit Form Date: 6/18/20

Location ID: GAF-440 Sample Depth (ft bgs): 49

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model PRO PLUS

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [ ] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	19.1	
pH (S.U.)	6.48	
Dissolved Oxygen (mg/L)	0.37	
Dissolved Oxygen (%)	3.7	
ORP (mv)	-21.9	
Turbidity (NTU)	OR	
Aerated pH (S.U.)	6.39	
Dissolved carbon dioxide (mg/L)	760 mg/L	124 mg/L
Ferrous iron (Fe[II]) (mg/L)	1 mg/L	1 mg/L
Sulfide (mg/L)	0 mg/L	0 mg/L

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/18/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: [redacted] 60621225.01

Field Parameters and Colorimetric Field Test Kit Form Date: 6/17/20

Location ID: GAF-MW-11 Sample Depth (ft bgs): 53

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model PRO PLUS

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [ ] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	20.6	
pH (S.U.)	3.25	
Dissolved Oxygen (mg/L)	0.14	
Dissolved Oxygen (%)	1.4	
ORP (mv)	326.8	
Turbidity (NTU)	570	
Aerated pH (S.U.)	3.27	
Dissolved carbon dioxide (mg/L)	60 mg/L	58 mg/L
Ferrous iron (Fe[II]) (mg/L)	6 mg/L	5 mg/L
Sulfide (mg/L)	0 mg/L	0 mg/L

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/17/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: [redacted] 60621225.01

Field Parameters and Colorimetric Field Test Kit Form Date: 6/18/20

Location ID: GAF-MW2U Sample Depth (ft bgs): 67

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model PRO PLUS

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [ ] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	18.5	
pH (S.U.)	6.30	
Dissolved Oxygen (mg/L)	0.34	
Dissolved Oxygen (%)	3.4	
ORP (mv)	-69.3	
Turbidity (NTU)	23.6	
Aerated pH (S.U.)	6.21	
Dissolved carbon dioxide (mg/L)	70 mg/L	36 mg/L
Ferrous iron (Fe[II]) (mg/L)	7 mg/L	5 mg/L
Sulfide (mg/L)	0 mg/L	0 mg/L

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/18/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: [redacted] 60621225.01

Field Parameters and Colorimetric Field Test Kit Form Date: 6/16/20

Location ID: GAF-MW-4U Sample Depth (ft bgs): 58

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model PRO PLUS

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [ ] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	19.0	
pH (S.U.)	4.47	
Dissolved Oxygen (mg/L)	0.30	
Dissolved Oxygen (%)	3.0	
ORP (mv)	190.2	
Turbidity (NTU)	10.2	
Aerated pH (S.U.)	4.51	
Dissolved carbon dioxide (mg/L)	150 mg/L	148 mg/L
Ferrous iron (Fe[II]) (mg/L)	5.5 mg/L	4.5 mg/L
Sulfide (mg/L)	0 mg/L	0 mg/L

Sampler Name: Jonathan Moskal Signature: Jonathan Moskal Date: 6/16/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 6.17.20

Location ID: 447U Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make_____ Model_____

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)		
pH (S.U.)		
Dissolved Oxygen (mg/L)		
Dissolved Oxygen (%)		
ORP (mv)		
Turbidity (NTU)		
Aerated pH (S.U.)		
Dissolved carbon dioxide (mg/L)	245	
Ferrous iron (Fe[II]) (mg/L)	5.8	
Sulfide (mg/L)	0.0	

Sampler Name: _____ Signature:_____ Date: 6.17.20

Reviewed By: _____ Signature:_____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 6.17.20

Location ID: 4481 Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make_____ Model_____

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)		
pH (S.U.)		
Dissolved Oxygen (mg/L)		
Dissolved Oxygen (%)		
ORP (mv)		
Turbidity (NTU)		
Aerated pH (S.U.)		
Dissolved carbon dioxide (mg/L)	~~3~~ 400	
Ferrous iron (Fe[II]) (mg/L)	~~400~~ 3	
Sulfide (mg/L)	0.0	

Sampler Name: _____ Signature:_____ Date: 6.17.20

Reviewed By: _____ Signature:_____ Date: _____

Revised Michelle Friedman, 6/24/2020, based on a review of historic data and test kit ranges.

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: [redacted] 60621225.01

Field Parameters and Colorimetric Field Test Kit Form Date: 6/18/20

Location ID: GAF-489V Sample Depth (ft bgs): 57

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model PRO PLUS

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [ ] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	16.7	
pH (S.U.)	5.56	
Dissolved Oxygen (mg/L)	4.66	
Dissolved Oxygen (%)	47.5	
ORP (mv)	219.6	
Turbidity (NTU)	43.6	
Aerated pH (S.U.)	5.61	
Dissolved carbon dioxide (mg/L)	30 mg/L	24 mg/L
Ferrous iron (Fe[II]) (mg/L)	6 mg/L	5 mg/L
Sulfide (mg/L)	0 mg/L	0 mg/L

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/18/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: [redacted] 60627477

Field Parameters and Colorimetric Field Test Kit Form Date: 6/19/20

Location ID: GAF-450L Sample Depth (ft bgs): 95.5

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model PRO PLUS

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [ ] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	20.3	
pH (S.U.)	6.98	
Dissolved Oxygen (mg/L)	0.13	
Dissolved Oxygen (%)	1.3	
ORP (mv)	-96.1	
Turbidity (NTU)	3.64	
Aerated pH (S.U.)	6.92	
Dissolved carbon dioxide (mg/L)	186 mg/L	160 mg/L
Ferrous iron (Fe[II]) (mg/L)	4.5 mg/L	3 mg/L
Sulfide (mg/L)	0 mg/L	0 mg/L

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/19/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 6.17.20

Location ID: 526U Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make_____ Model_____

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)		
pH (S.U.)		
Dissolved Oxygen (mg/L)		
Dissolved Oxygen (%)		
ORP (mv)		
Turbidity (NTU)		
Aerated pH (S.U.)		
Dissolved carbon dioxide (mg/L)	70	
Ferrous iron (Fe[II]) (mg/L)	0.7	
Sulfide (mg/L)	0.0	

Sampler Name: _____ Signature:_____ Date: 6.18.20

Reviewed By: _____ Signature:_____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: [redacted] 60621225.01

Field Parameters and Colorimetric Field Test Kit Form Date: 6/17/20

Location ID: GAF-SW1U Sample Depth (ft bgs): 60.5

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model PRO PLUS

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [ ] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	18.8	
pH (S.U.)	6.09	
Dissolved Oxygen (mg/L)	0.42	
Dissolved Oxygen (%)	4.2	
ORP (mv)	-22.4	
Turbidity (NTU)	15.8	
Aerated pH (S.U.)	6.12	
Dissolved carbon dioxide (mg/L)	54 mg/L	52 mg/L
Ferrous iron (Fe[II]) (mg/L)	7 mg/L	5 mg/L
Sulfide (mg/L)	0 mg/L	0 mg/L

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 6/17/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 6.17.20

Location ID: S3 Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- ☑ Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make_____ Model_____

Sample Collection Method ☑ Low Flow ☐ Bailer

Field Parameter Stability? ☑ Flow Thru Cell ☐ Field Cup ☐ pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)		
pH (S.U.)		
Dissolved Oxygen (mg/L)		
Dissolved Oxygen (%)		
ORP (mv)		
Turbidity (NTU)		
Aerated pH (S.U.)		
Dissolved carbon dioxide (mg/L)	175	
Ferrous iron (Fe[II]) (mg/L)	2.7	
Sulfide (mg/L)	0.0	

Sampler Name: _____ Signature:_____ Date: 6.18.20

Reviewed By: _____ Signature:_____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: [redacted] 60627477.02

Field Parameters and Colorimetric Field Test Kit Form Date: 7/14/20

Location ID: 26 Sample Depth (ft bgs): 101

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model PRO PLUS

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [ ] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	22.73	
pH (S.U.)	7.57	
Dissolved Oxygen (mg/L)	0.81	
Dissolved Oxygen (%)	8.1	
ORP (mv)	-165.4	
Turbidity (NTU)	9.77	
Aerated pH (S.U.)	7.61	
Dissolved carbon dioxide (mg/L)	120 mg/L	115 mg/L
Ferrous iron (Fe[II]) (mg/L)	7 mg/L	7 mg/L
Sulfide (mg/L)	0 mg/L	0 mg/L

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/14/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: [redacted] 60627477.02

Field Parameters and Colorimetric Field Test Kit Form Date: 7/15/20

Location ID: 27 Sample Depth (ft bgs): 85

Colorimetric Equipment (verify):

- [x] Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- [x] EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)
- [x] Hach Carbon Dioxide Test Kit, Model CA-23

Field Sonde: Make YSI Model PRO PLUS

Sample Collection Method [x] Low Flow [ ] Bailer

Field Parameter Stability? [x] Flow Thru Cell [ ] Field Cup [ ] pH Paper (pH only)

Field Measurement	Total (Non-Filtered) Sample	Dissolved (Filtered) Sample
Temperature (°Celsius)	18.7	
pH (S.U.)	7.76	
Dissolved Oxygen (mg/L)	0.38	
Dissolved Oxygen (%)	3.8	
ORP (mv)	-416	
Turbidity (NTU)	1.72	
Aerated pH (S.U.)	7.38	
Dissolved carbon dioxide (mg/L)	60 mg/L	56 mg/L
Ferrous iron (Fe[II]) (mg/L)	3 mg/L	2 mg/L
Sulfide (mg/L)	0 mg/L	0 mg/L

Sampler Name: JONATHAN MOSKAL Signature: Jonathan Moskal Date: 7/15/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8/17/20

Location ID: 19R Sample Depth (ft bgs): 47

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	3.62	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	34 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	5.5 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 8/17/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8.17.20

Location ID: GAF 20 Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.15	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	110	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	2.2	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 8.17.20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8.18.20

Location ID: GAF 22 Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	7.1	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	35	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	0.0	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 8.18.20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8/20/20

Location ID: 439U Sample Depth (ft bgs): 35

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.59	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	145 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	4.5 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 8/20/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8/19/20

Location ID: 440U Sample Depth (ft bgs): 49

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.73	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	72 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	1.5 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 8/19/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8.18.20

Location ID: GAF 441 U Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	2.7	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	>150	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	5.5	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 8.18.20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8/19/20

Location ID: 442U Sample Depth (ft bgs): 67

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.86	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	60 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	4 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 8/19/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8/19/20

Location ID: 444 U Sample Depth (ft bgs): 58

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.52	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	160 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	3 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 8/19/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8/18/20

Location ID: 447U Sample Depth (ft bgs): 14

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.70	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	248 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	5 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 8/18/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8/18/20

Location ID: 448U Sample Depth (ft bgs): 45.5

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.04	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	284 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	6 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 8/18/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8.20.20

Location ID: GAF 489 U Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	5.5	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	35	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	0.0	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 8.20.20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8.19.20

Location ID: GAF 526 U Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.8	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	60	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	1.0	
Sulfide (mg/L) (range: 0-10 mg/L)	0.2	

Sampler Name: Charlie Howard Signature: [signature] Date: 8.19.20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8.18.20

Location ID: GAF 541 U Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	5.9	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	115	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	3.3	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 8.18.20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 8.19.20

Location ID: GAF S3 Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	3.6	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	>150	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	1.5	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 8.19.20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10·21·20

Location ID: GAF 19R Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	3.59	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	50	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	7.0	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 10·21·20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10/21/20

Location ID: Z0 Sample Depth (ft bgs): 50

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.22	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	202 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	6 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 10/21/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10·21·20

Location ID: GAF 22 Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	7.02	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	40	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	0.0	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 10·21·20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10/19/20

Location ID: 439U Sample Depth (ft bgs): 35

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.65	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	130 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	5.0 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 10/19/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10.20.20

Location ID: GAF 440 U Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.67	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	100	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	1.0	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 10.20.20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10/22/20

Location ID: 4410 Sample Depth (ft bgs): 48

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	3.76	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	70 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	5.5 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 10/22/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10/20/20

Location ID: 442U Sample Depth (ft bgs): 67

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.41	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	56 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	5 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. Moskal Signature: [signature] Date: 10/20/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10·22·20

Location ID: GAF 444 U Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	4.17	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	40	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	6.0	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 10·22·20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10/19/20

Location ID: 447U Sample Depth (ft bgs): 14

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.35	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	232 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	5 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 10/19/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10·19·20

Location ID: GAF 448 U Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.62	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	100	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	5.5	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 10·19·20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10·22·20

Location ID: GAF 489U Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	15.20	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	50	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	0.0	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 10·22·20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10·19·20

Location ID: GAF 526 U Sample Depth (ft bgs): _____

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model ProPlus

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	7.14	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	30	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	0.5	
Sulfide (mg/L) (range: 0-10 mg/L)	0.0	

Sampler Name: Charlie Howard Signature: [signature] Date: 10·19·20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10/22/20

Location ID: 541U Sample Depth (ft bgs): 58

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	6.09	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	50 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	7 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: JM Date: 10/22/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

Field Parameters and Colorimetric Field Test Kit Form Date: 10/22/20

Location ID: S3 Sample Depth (ft bgs): 56

Colorimetric Equipment (verify):

- ☑ Hach Carbon Dioxide Test Kit, Model CA-23
- ☑ Hach Ferrous Iron Color Disk Test Kit Model IR-18C, 0.2-7 mg/L
- ☑ EPA Test Method 8131 (Hach Sulfide Reagent Kit, methylene blue)

Field Sonde for pH: Make YSI Model YSI PRO

Field Measurement	**Results, Total (Non-filtered)**	**Notes** (other observations such as unusual colors or precipitates, etc.)
Aerated pH (S.U.)	9.01	
Dissolved carbon dioxide (mg/L) (range: 0-100 mg/L)	120 mg/L	
Ferrous iron (Fe[II]) (mg/L) (range: 0-7 mg/L)	5 mg/L	
Sulfide (mg/L) (range: 0-10 mg/L)	0 mg/L	

Sampler Name: J. MOSKAL Signature: [signature] Date: 10/22/20

Reviewed By: _____ Signature: _____ Date: _____

In Situ Grab Groundwater Sampling Field Sheets

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 1/30/20

Location ID: NRS 052

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☑ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

SAMPLE TIME 1035
DEPTH – 35'-39'

Field Measurement	Depth and Sample ID: GAF-GW-~~NRS052~~ 35-39-01302020 NRS052	Depth and Sample ID: DEPTH	Depth and Sample ID: DEPTH
Temperature (°Celsius)	12.2		
pH (S.U.)	6.96		
Dissolved Oxygen (mg/L)	1.11	DRY	DRY
Dissolved Oxygen (%)	10.3		
ORP (mv)	-81.2		
Specific Cond. (uS/cm)	1783		
2-minute filter purge completed?	Yes / (No) 1 MIN.	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID.	DRY	DRY

Sampler Name: ETHAN HOUSE Signature: EH Date: 1/30/20

Reviewed By: _____ Signature: _____ Date: _____

Field sheet edits by M. Friedman after discussions with Ethan House and review of DRE. 5/11/2020

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 1/29/20

Location ID: NRS 053

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☑ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

Field Measurement	Depth and Sample ID: SAMPLE 1340 DEPTH – 68-72' GAF-GW-NRS053-68-72-01292020	Depth and Sample ID: DEPTH 30'-45'	Depth and Sample ID: DEPTH 55'-60'
Temperature (°Celsius)	14.5		
pH (S.U.)	6.78		
Dissolved Oxygen (mg/L)	1.52	DRY	DRY
Dissolved Oxygen (%)	15.1		
ORP (mv)	6.1		
Specific Cond. (uS/cm)	2424		
2-minute filter purge completed?	Yes / (No) 1 MIN.	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID.	DRY	DRY

Sampler Name: ETHAN HOUSE Signature: EH Date: 1/29/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 1/29/20

Location ID: NRS 054

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☑ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

Field Measurement	**Depth and Sample ID:** SAMPLE 0845 DEPTH – 62-66' GAF-GW-NRS054-62-66-01292020	**Depth and Sample ID:** DEPTH 30'-45'	**Depth and Sample ID:** DEPTH 50'-60'
Temperature (°Celsius)	6.3		
pH (S.U.)	6.97		
Dissolved Oxygen (mg/L)	2.04	DRY	DRY
Dissolved Oxygen (%)	16.7		
ORP (mv)	–66.4		
Specific Cond. (uS/cm)	3504		
2-minute filter purge completed?	Yes / (No) / MIN.	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID. COLLECTED SAMPLE 1/29/20 AT SAMPLE TIME – 0845	DRY	DRY

Sampler Name: ETHAN HOUSE Signature: _____ Date: 1/29/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 1/28/20

Location ID: NRS055

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☑ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

	DEPTH – 66-70'	DEPTH 30'-45'	DEPTH 45'-49'
Field Measurement	**Depth and Sample ID:** GAF-GW-NRS055-66-70-01272020	**Depth and Sample ID:**	**Depth and Sample ID:**
Temperature (°Celsius)	13.9		
pH (S.U.)	6.52		
Dissolved Oxygen (mg/L)	0.70	DRY	DRY
Dissolved Oxygen (%)	6.7		
ORP (mv)	-29.7		
Specific Cond. (uS/cm)	2619		
2-minute filter purge completed?	Yes / (No) / MIN.	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID. COLLECTED SAMPLE 1/28/20 AT SAMPLE TIME – 1135	DRY	DRY

Sampler Name: ETHAN HOUSE Signature: EH Date: 1/28/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 1/27/20

Location ID: NRS 056

Field Sonde: Make YSI Model FLOW CELL

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☑ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

Field Measurement	Depth and Sample ID: (DEPTH - 65'-69') GAF-GW-NRS056-65-69-01272020	Depth and Sample ID: (DEPTH 30'-34')	Depth and Sample ID: (DEPTH 45'-49')
Temperature (°Celsius)	12.6		
pH (S.U.)	7.52		
Dissolved Oxygen (mg/L)	4.92	DRY	DRY
Dissolved Oxygen (%)	45.8		
ORP (mv)	215.1		
Specific Cond. ~~(uS/cm)~~ (MS/CM)	1.43		
2-minute filter purge completed?	Yes / (No) 1 MIN.	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID. COLLECTED SAMPLE 1/27/20 AT 1600.	DRY	DRY

Sampler Name: ETHAN HOUSE Signature: [signature] Date: 1/27/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 2/3/20

Location ID: NRS 057

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☑ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

SAMPLE TIME 1640
DEPTH – 16'-20'

Field Measurement	**Depth and Sample ID:** GAF-GW-NRS057-16-20-02032020	**Depth and Sample ID:**	**Depth and Sample ID:**
Temperature (°Celsius)	20.7		
pH (S.U.)	5.60		
Dissolved Oxygen (mg/L)	0.82		
Dissolved Oxygen (%)	9.2		
ORP (mv)	-1.8		
Specific Cond. (uS/cm)	3469		
2-minute filter purge completed?	Yes / (No) / MIN.	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID.		

Sampler Name: ETHAN HOUSE Signature: [signature] Date: 2/3/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 2/3/20

Location ID: NRS 058

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☑ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

SAMPLE TIME 1000
DEPTH – 16'-20'

SAMPLE TIME- DID NOT SAMPLE
~~DEPTH – 71'-75'~~ Depth 59-63

Field Measurement	Depth and Sample ID: GAF-GW-NRS058-16-20-02032020	Depth and Sample ID:	Depth and Sample ID:
Temperature (°Celsius)	19.4	19.8	
pH (S.U.)	6.47	6.59	
Dissolved Oxygen (mg/L)	0.07	0.63	
Dissolved Oxygen (%)	0.8	6.9	
ORP (mv)	-92.0	71.4	
Specific Cond. (uS/cm)	3559	1222	
2-minute filter purge completed?	Yes / (No) / 1 MIN.	Yes / (No)	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID.	TURBIDITY NOT RECORDED SAMPLE WAS TURBID. DID NOT SAMPLE	

Sampler Name: ETHAN HOUSE Signature: EH Date: 2/3/20

Reviewed By: _____ Signature: _____ Date: _____

Field sheet edits by M. Friedman after discussions with Ethan House, based on refusal depth of 63.5 feet bgs 4/20/2020

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 2/4/20

Location ID: NRS 059

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☑ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

SAMPLE TIME – 1100
DEPTH – 41'-45'

Field Measurement	**Depth and Sample ID:** GAF-GW-NRS059-41-45-02042020	**Depth and Sample ID:**	**Depth and Sample ID:**
Temperature (°Celsius)	17.6		
pH (S.U.)	6.47		
Dissolved Oxygen (mg/L)	1.19		
Dissolved Oxygen (%)	12.1		
ORP (mv)	-82.4		
Specific Cond. (uS/cm)	1449		
2-minute filter purge completed?	Yes / (No) 1 MIN.	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID.		

Sampler Name: ETHAN HOUSE Signature: [signature] Date: 2/4/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 2/3/20

Location ID: NRS 060

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☑ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

SAMPLE TIME 1330
DEPTH – 16'-20'

SAMPLE TIME- 0830
DEPTH - 71'-75'

Field Measurement	Depth and Sample ID: GAF-GW-NRS060-16-20-01312020	Depth and Sample ID: GAF-GW-~~NRS061~~-71-75-02032020 NRS060	Depth and Sample ID:
Temperature (°Celsius)	16.0	17.5	
pH (S.U.)	4.92	5.11	
Dissolved Oxygen (mg/L)	1.04	3.59	
Dissolved Oxygen (%)	10.7	38.8	
ORP (mv)	101.7	78.4	
Specific Cond. (uS/cm)	4319	10206	
2-minute filter purge completed?	Yes / (No) 1 MIN.	Yes / (No)	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID.	TURBIDITY NOT RECORDED SAMPLE WAS TURBID.	

Sampler Name: ETHAN HOUSE Signature: EH Date: 2/3/20

Reviewed By: _____ Signature: _____ Date: _____

Field sheet edits by M. Friedman after discussions with Ethan House and review of DRE. 5/11/2020

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 1/31/20

Location ID: NRS 061

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☑ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

SAMPLE TIME 1115 DEPTH – 14'-18' | TIME – 1030 DEPTH – 38'-42' | DEPTH

Field Measurement	Depth and Sample ID: GAF-GW-NRS061-14-18-01312020	Depth and Sample ID: GAF-GW-NRS061-38-42-01312020	Depth and Sample ID:
Temperature (°Celsius)	12.5	16.0	
pH (S.U.)	6.18	5.87	
Dissolved Oxygen (mg/L)	0.26	1.79	
Dissolved Oxygen (%)	2.4	18.1	DRY
ORP (mv)	-91.7	-28.9	
Specific Cond. (uS/cm)	3810	4466	
2-minute filter purge completed?	Yes / (No) / 1 MIN.	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID.	DRY	DRY

Sampler Name: ETHAN HOUSE Signature: EH Date: 1/31/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 1/30/20

Location ID: ~~NRS062~~ NRS062

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☑ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

SAMPLE TIME 1635
DEPTH – 29'–33'

Field Measurement	Depth and Sample ID: GAF-GW-~~NRS062~~NRS062-29-33-01302020	DEPTH Depth and Sample ID:	DEPTH Depth and Sample ID:
Temperature (°Celsius)	15.2		
pH (S.U.)	6.46		
Dissolved Oxygen (mg/L)	1.19	DRY	DRY
Dissolved Oxygen (%)	12.0		
ORP (mv)	11.9		
Specific Cond. (uS/cm)	2751		
2-minute filter purge completed?	Yes / (No) / MIN.	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID. Duplicate collected here GAF-AQ-903-01302020	DRY	DRY

Sampler Name: ETHAN HOUSE Signature: EH Date: 1/30/20

Reviewed By: _____ Signature: _____ Date: _____

Field sheet edits by M. Friedman after discussions with Ethan House and review of DRE. 5/11/2020

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 2/4/20

Location ID: NRS 064

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☐ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

SAMPLE TIME – 1615
DEPTH – 11' – 15'

Field Measurement	**Depth and Sample ID:** GAF-GW-NRS064-11-15-02042020	**Depth and Sample ID:**	**Depth and Sample ID:**
Temperature (°Celsius)	NO READING		
pH (S.U.)	10.18		
Dissolved Oxygen (mg/L)	3.83		
Dissolved Oxygen (%)	35.2		
ORP (mv)	150.4		
Specific Cond. (uS/cm)	1028		
2-minute filter purge completed?	Yes / (No) 1 MIN.	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID.		

Sampler Name: ETHAN HOUSE Signature: [signature] Date: 2/4/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 2/5/20

Location ID: NRS 064

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☐ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

Field Measurement	**Depth and Sample ID:** DEPTH – 44'-48'	**Depth and Sample ID:**	**Depth and Sample ID:**
Temperature (°Celsius)	17.0		
pH (S.U.)	8.46		
Dissolved Oxygen (mg/L)	1.90		
Dissolved Oxygen (%)	19.7		
ORP (mv)	42.0		
Specific Cond. (uS/cm)	423.5		
2-minute filter purge completed?	Yes / No	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID.		

Sampler Name: ETHAN HOUSE Signature: [signature] Date: 2/5/20

Reviewed By: _____ Signature: _____ Date: _____

Project / Site: TVA Gallatin Fossil Plant
Task: Bench Scale Treatability Testing Work Plan
Project #: 60621225

DPT Grab Sampling Form Date: 2/4/20

Location ID: NRS 065

Field Sonde: Make YSI Model FLOW CELL – PRO

Sample Collection Method ☑ Peristaltic ☐ Bailer ☐ Other _____

Field Parameter Stability? ☐ Flow Thru Cell ☑ Field Cup ☐ pH Paper (pH only)

SAMPLE TIME – 1500
DEPTH – 43'–47'

Field Measurement	Depth and Sample ID: GAF-GW-NRS065-43-47-02042020	Depth and Sample ID:	Depth and Sample ID:
Temperature (°Celsius)	NO READING		
pH (S.U.)	8.71		
Dissolved Oxygen (mg/L)	8.18		
Dissolved Oxygen (%)	72.1		
ORP (mv)	164.0		
Specific Cond. (uS/cm)	355.3		
2-minute filter purge completed?	Yes / (No) 1 MIN.	Yes / No	Yes / No
Sampling Notes	TURBIDITY NOT RECORDED SAMPLE WAS TURBID.		

Sampler Name: ETHAN HOUSE Signature: [signature] Date: 2/4/20

Reviewed By: _____ Signature: _____ Date: _____

Appendix E – Hydraulic Testing Analyses

Table of Contents

1. Drawdown Test Analysis - Wells 19R and S3

2. Slug Test Analysis

Drawdown Test Analysis - Wells 19R and S3

Calculation Sheet (Well 19R)
Estimation of Hydraulic Conductivity at Well 19R from Low-Yield Pumping Data
Well 19R 18-Aug-20

time	elapsed time (min)	Rate (L/Min)	Rate (gpm)	DTW (ft btoc)	Change in head (ft)
700	0	0.24	0.063	28.65	0
705	5	0.24	0.063	29.95	1.3
710	10	0.24	0.063	30.34	1.69
715	15	0.24	0.063	30.72	2.07
720	20	0.24	0.063	31.11	2.46
725	25	0.24	0.063	31.21	2.56
730	30	0.48	0.127	31.25	2.6
740	40	0.48	0.127	31.26	2.61
750	50	0.48	0.127	31.27	2.62
800	60	0.48	0.127	31.28	2.63
810	70	0.48	0.127	31.29	2.64
820	80	0.48	0.127	31.3	2.65
830	90	0.48	0.127	31.3	2.65
840	100	0.48	0.127	31.31	2.66
850	110	0.48	0.127	31.32	2.67
900	120	0.48	0.127	31.33	2.68
910	130	0.48	0.127	31.34	2.69
920	140	0.48	0.127	31.35	2.7
930	150	0.48	0.127	31.35	2.7

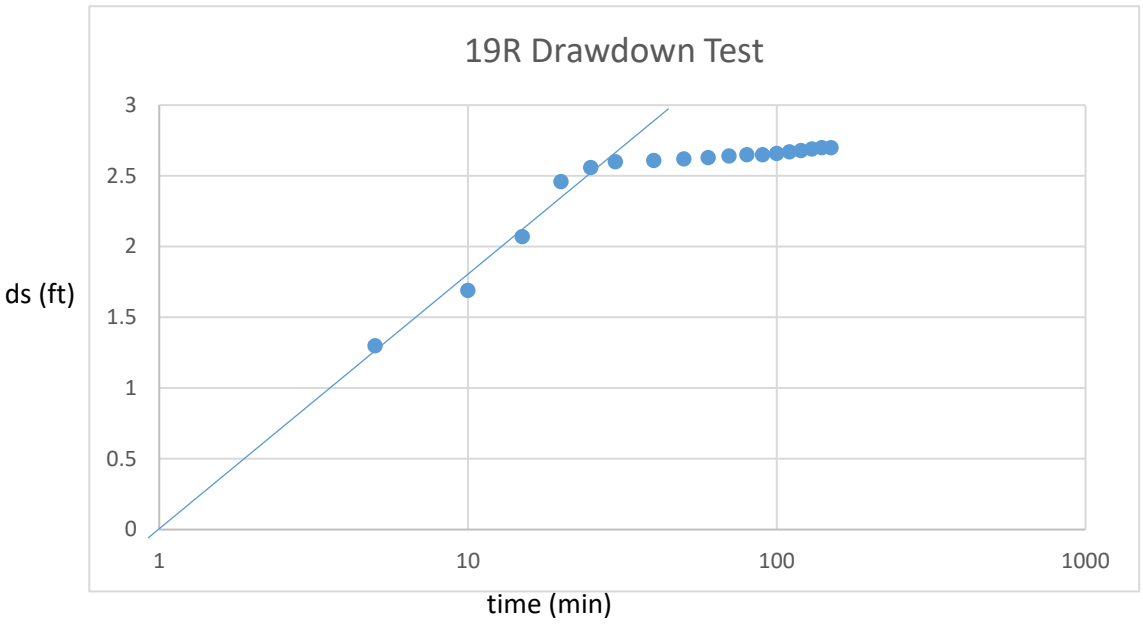
Transmissivity and K Estimates:

Q=	0.063	gpm	rate for first 25 min
	12.1	ft3/d	
ds=	1.7	ft	change in drawdown per log cycle
b=	10	ft	assumed aquifer thickness of screen length

Specific Capacity: **0.047 gpm/ft**

Available drawdown	13.46	ft	(static WL to screen top)
stickup	2.61	ft	
screen top depth	39.5	ft bgs	
screen bottom depth	49.5	ft bgs	
Static DTW	28.65	ft btoc	
	26.04	ft bgs	
Depth to more permeable strata	46	ft bgs	(from S3 well log)
Maximum yield	**0.632**	**gpm**	

Method: Cooper and Jacob, 1946



T= $\frac{2.3Q}{4TTds}$ K= T/b

1.31 ft2/d 0.13 ft/d

4.61E-05 cm/s

27.899
21.36283
1.30596
0.130596

Calculation Sheet (Well S3)
Estimation of Hydraulic Conductivity at Well S3 from Low-Yield Pumping Data

time	elapsed time (min)	Rate (L/Min)	Rate (gpm)	DTW (ft btoc)	Change in head (ft)
1030	0	0.4	0.106	28.07	0
1035	5	0.4	0.106	28.54	0.47
1036	6	0.4	0.106	28.74	0.67
1037	7	0.4	0.106	29.04	0.97
1038	8	0.4	0.106	29.2	1.13
1039	9	0.4	0.106	29.38	1.31
1040	10	0.4	0.106	29.44	1.37
1041	11	0.4	0.106	29.53	1.46
1042	12	0.4	0.106	29.56	1.49
1043	13	0.4	0.106	29.64	1.57
1044	14	0.4	0.106	29.68	1.61
1045	15	0.4	0.106		1.66
1055	25	0.4	0.106	29.78	1.71
1105	35	0.4	0.106	29.78	1.71
1115	35	0.4	0.106	29.8	1.73
1125	55	0.4	0.106	29.79	1.72
1135	65	0.4	0.106	29.79	1.72

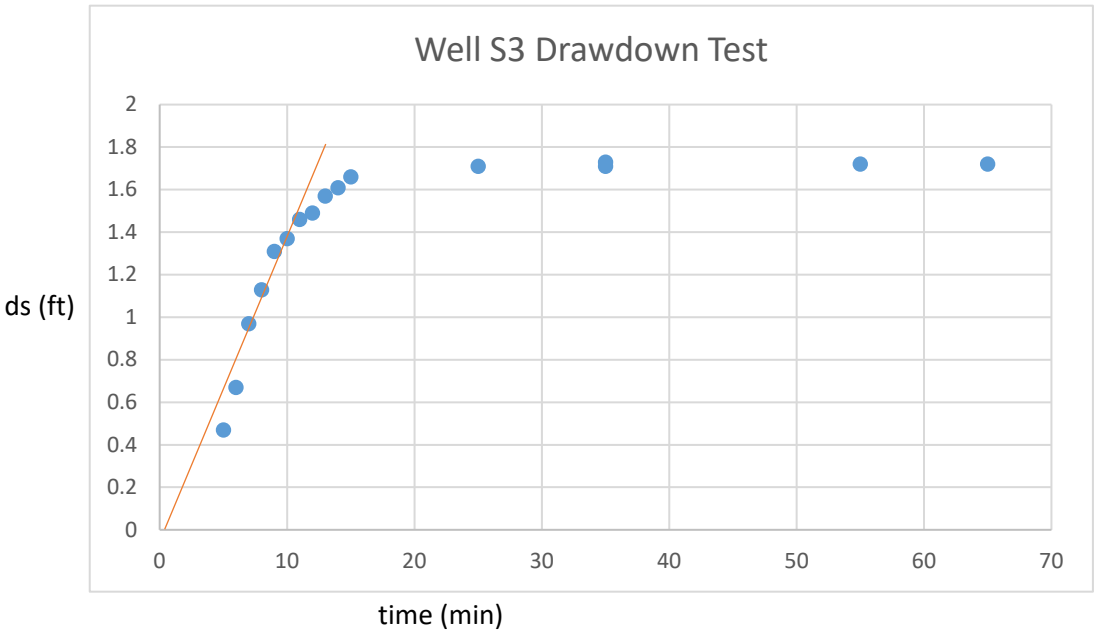
Transmissivity and K Estimates:

Q=	0.106	gpm	rate for first 25 min
	20.4	ft3/d	
ds=	1.39	ft	change in drawdown per log cycle
b=	10	ft	assumed aquifer thickness of screen length

Specific Capacity:	**0.061**	**gpm/ft**	
Available drawdown	19.63	ft	distance static WL to permeable strata
stickup	1.7	ft	
screen top depth	48	ft bgs	
screen bottom depth	58	ft bgs	
Static DTW	28.07	ft btoc	
	26.37	ft bgs	
Depth to more permeable strata	46	ft bgs	(from S3 well log)
Maximum yield	**1.205**	**gpm**	

Method: Cooper and Jacob, 1946

Calculated by M Stauffer 9-8-20
Checked by B Donovan 09-10-20

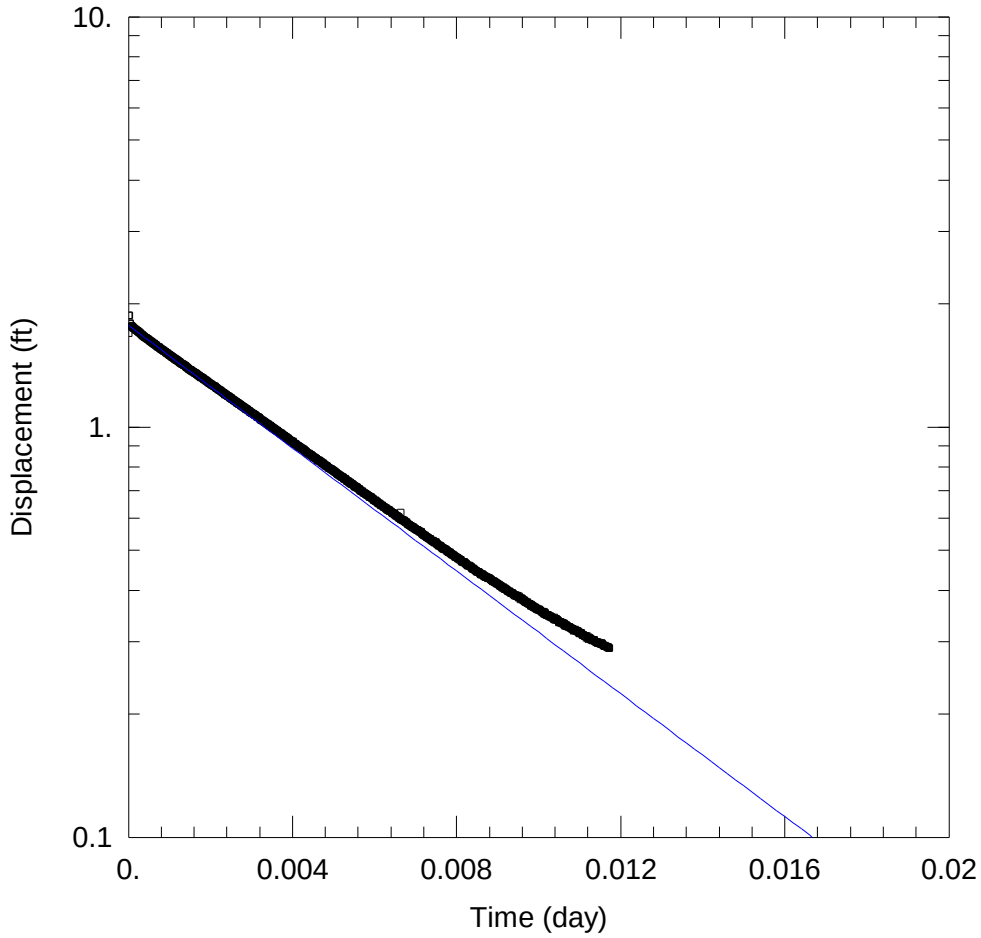


T= $\frac{2.3Q}{4TTds}$ K= T/b

2.69 ft2/d 0.27 ft/d
9.48E-05 cm/s

46.92
17.46726
2.686169
0.268617

Slug Test Analysis



GAF-440U

Data Set: \...\GAF-440U.aqt
Date: 10/16/20 Time: 14:43:31

PROJECT INFORMATION

Company: AECOM
Client: TVA
Project: 60621225
Location: Gallatin, TN
Test Well: GAF-440U
Test Date: 5/1/2020

AQUIFER DATA

Saturated Thickness: 44.34 ft Anisotropy Ratio (Kz/Kr): 0.1

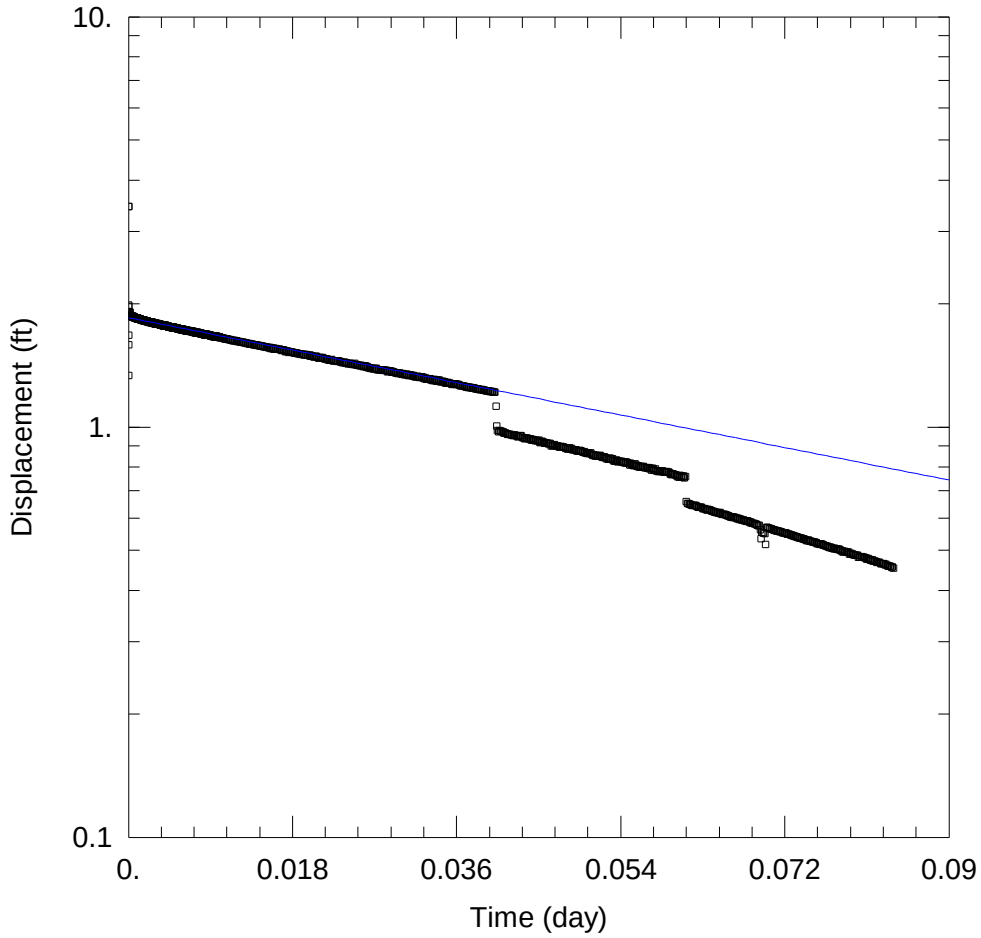
WELL DATA (GAF-440U)

Initial Displacement: 1.875 ft
Total Well Penetration Depth: 42.34 ft
Casing Radius: 0.083 ft
Static Water Column Height: 44.43 ft
Screen Length: 10. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.2727 ft/day y0 = 1.769 ft



GAF-442U

Data Set: \...\GAF-442.aqt
Date: 10/16/20 Time: 15:02:51

PROJECT INFORMATION

Company: AECOM
Client: TVA
Project: 60621225
Location: Gallatin, TN
Test Well: GAF-442U
Test Date: 5/1/2020

AQUIFER DATA

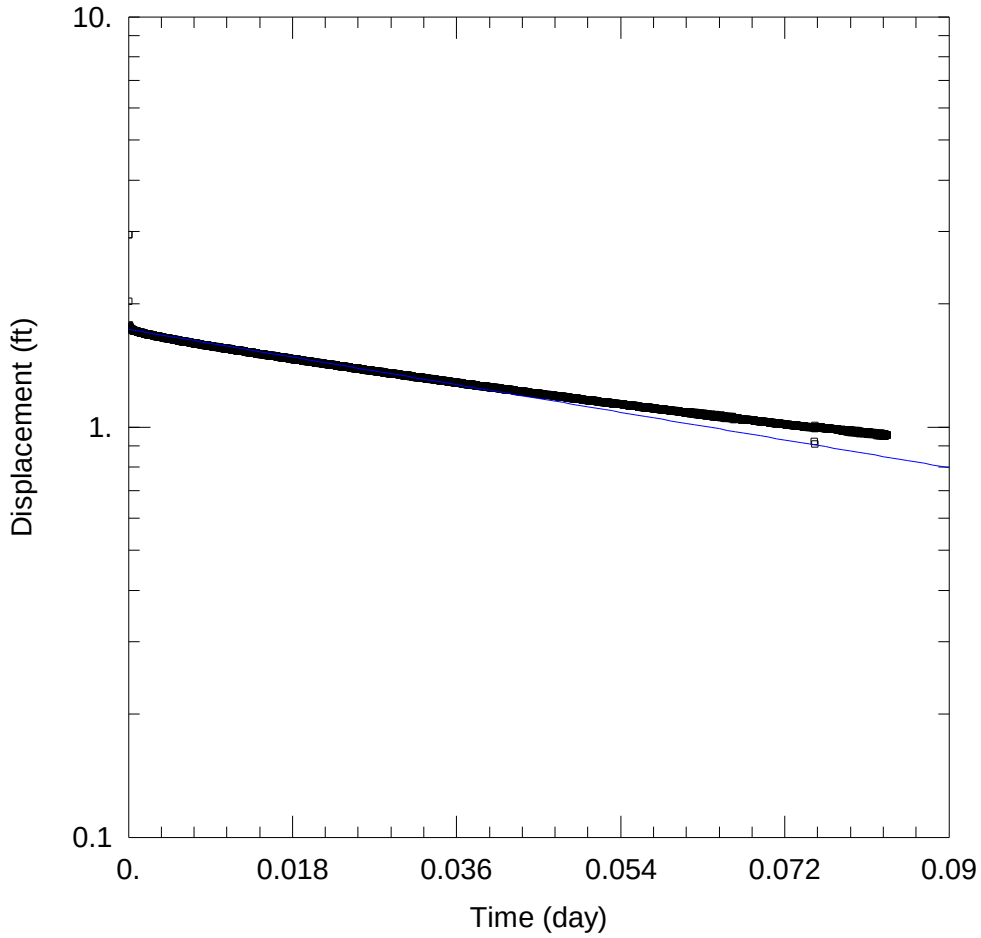
Saturated Thickness: 37.93 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (GAF-442U)

Initial Displacement: 3.453 ft
Total Well Penetration Depth: 30.73 ft
Casing Radius: 0.083 ft
Static Water Column Height: 30.73 ft
Screen Length: 10. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.01501 ft/day
y0 = 1.848 ft



WELL TEST ANALYSIS

Data Set: \...\GAF-444U.aqt
Date: 10/16/20 Time: 15:27:08

PROJECT INFORMATION

Company: AECOM
Client: TVA
Project: 60621225
Location: Gallatin, TN
Test Well: GAF-444U
Test Date: 4/30/2020

AQUIFER DATA

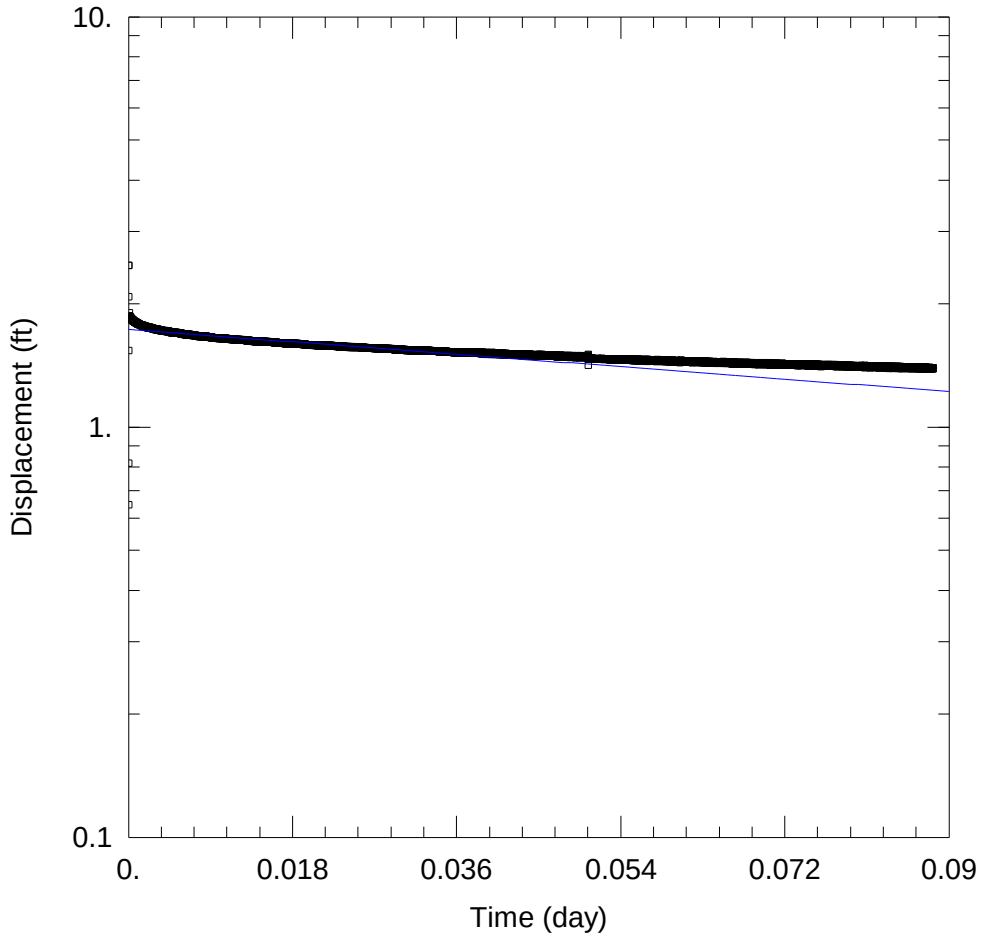
Saturated Thickness: 39.03 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (GAF-444U)

Initial Displacement: 2.946 ft
Total Well Penetration Depth: 27.53 ft
Casing Radius: 0.083 ft
Static Water Column Height: 27.53 ft
Screen Length: 10. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0125 ft/day
y0 = 1.729 ft



GAF-489U

Data Set: \...\GAF-489U.aqt
Date: 10/16/20 Time: 15:06:21

PROJECT INFORMATION

Company: AECOM
Client: TVA
Project: 60621225
Location: Gallatin, TN
Test Well: GAF-489U
Test Date: 5/1/2020

AQUIFER DATA

Saturated Thickness: 46.72 ft Anisotropy Ratio (Kz/Kr): 0.1

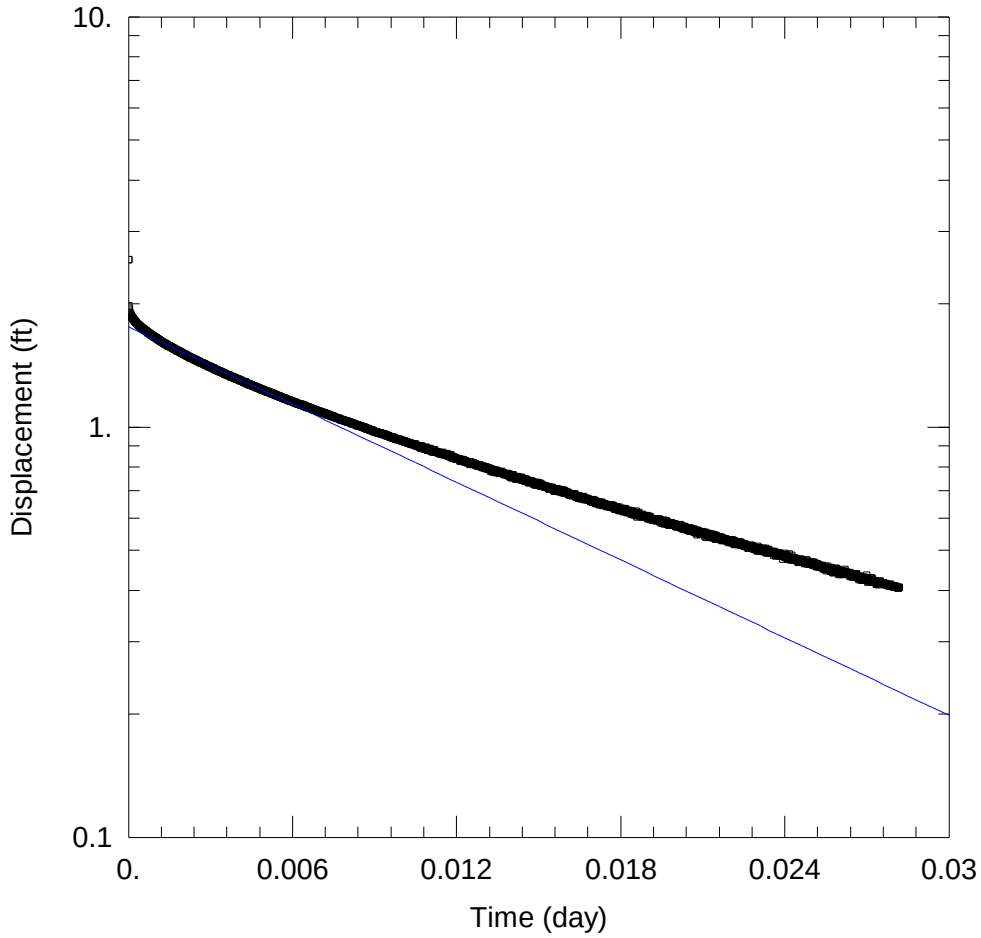
WELL DATA (GAF-489U)

Initial Displacement: 2.474 ft
Total Well Penetration Depth: 46.72 ft
Casing Radius: 0.083 ft
Static Water Column Height: 46.72 ft
Screen Length: 10. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.006745 ft/day y0 = 1.729 ft



GAF-526U

Data Set: \...\GAF-526U.aqt
Date: 10/16/20 Time: 15:18:01

PROJECT INFORMATION

Company: AECOM
Client: TVA
Project: 60621225
Location: Gallatin, TN
Test Well: GAF-526U
Test Date: 5/1/2020

AQUIFER DATA

Saturated Thickness: 73.93 ft Anisotropy Ratio (Kz/Kr): 0.1

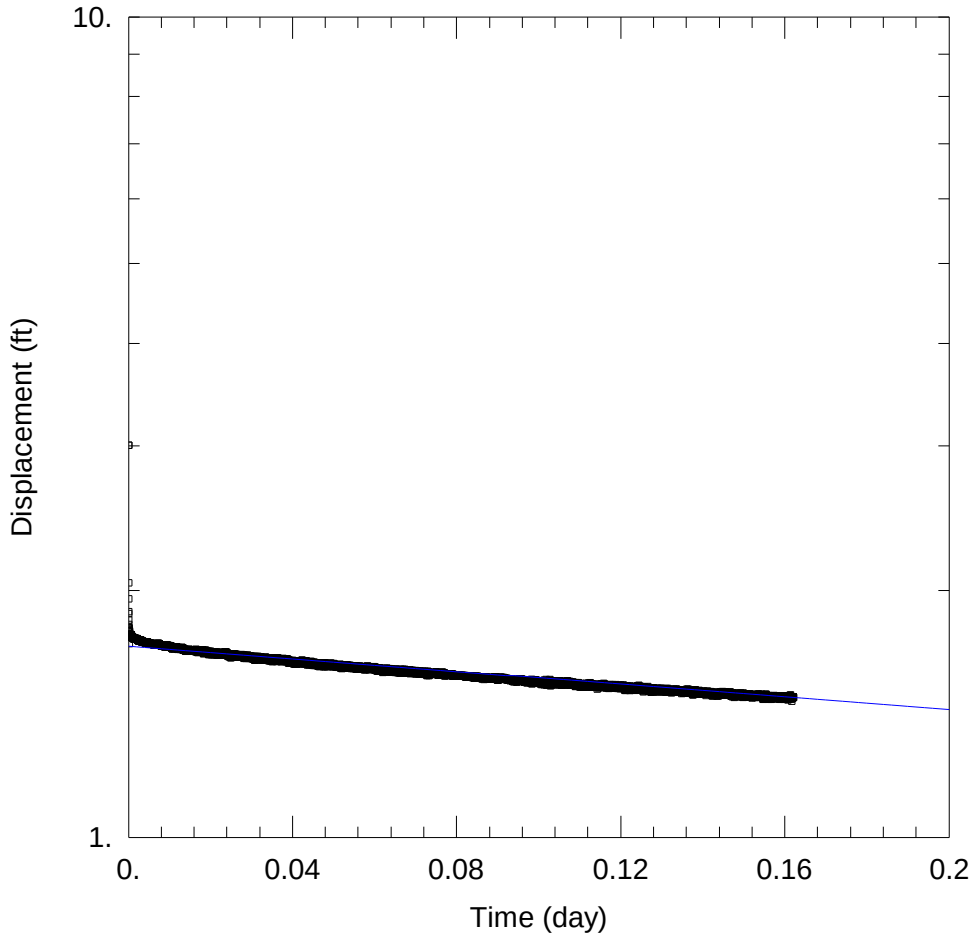
WELL DATA (GAF-526U)

Initial Displacement: 2.555 ft
Total Well Penetration Depth: 51.93 ft
Casing Radius: 0.083 ft
Static Water Column Height: 51.93 ft
Screen Length: 5. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.2059 ft/day y0 = 1.756 ft



WELL TEST ANALYSIS

Data Set: \...\GAF-541U.aqt
Date: 10/16/20 Time: 15:37:53

PROJECT INFORMATION

Company: AECOM
Client: TVA
Project: 60621225
Location: Gallatin, TN
Test Well: GAF-541U
Test Date: 4/30/2020

AQUIFER DATA

Saturated Thickness: 56.32 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (GAF-541U)

Initial Displacement: 3.005 ft
Total Well Penetration Depth: 52.92 ft
Casing Radius: 0.083 ft
Static Water Column Height: 52.92 ft
Screen Length: 5. ft
Well Radius: 0.083 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.002601 ft/day y0 = 1.709 ft

Appendix F – Coal Combustion Residuals Porewater Analytical Data

Table of Contents

1. CCR Well Analytical Data – 2011 and 2017

2. CCR Well pH Results - 2015

CCR Well Analytical Data – 2011 and 2017

Appendix F
CCR Well Analytical Data - 2011 and 2017

Location		GAF-439A	GAF-440AR	GAF-GP-1	GAF-GP-2	GAF-GP-3	GAF-GP-4	GAF-GP-5	GAF-GP-6
Sample Identification		GAF-439A-PW-20170126	GAF-440AR-PW-20170126	GAF-GP-1-20110901	GAF-GP-2-20110901	GAF-GP-3-20110901	GAF-GP-4-20110901	GAF-GP-5-20110901	GAF-GP-6-20110901
Date		26 Jan 2017	26 Jan 2017	01 Sep 2011	01 Sep 2011	01 Sep 2011	01 Sep 2011	01 Sep 2011	01 Sep 2011
Screen Depth (ft bgs)									
Total									
Beryllium	ug/L	0.131 UJ	0.131 UJ	2	2	2	2	2	2
Cadmium	ug/L	0.0781 U	0.0781 U	2.2	0.79	0.5	0.5	0.5	0.5
Iron	ug/L	9410 J	70 U*	3100	100	7600	100	100	300
Lithium	ug/L	31.2 J	48.5						
Nickel	ug/L	2.76 J	0.633 J	36	8.8	5.9	5.2	10	9.1
ORP	MV	-105.3	101.9						
pH, Field	pH units	7.08	8.78						
Specific Conductance, Field	umhos/cm	1155	2423						
Turbidity, field	NTU	1.2	3.9						
Dissolved									
Beryllium	ug/L	0.131 UJ	0.131 UJ						
Cadmium	ug/L	0.0781 U	0.0781 U						
Iron	ug/L	9770 J	28.5 U*						
Lithium	ug/L	30.9 J	48.3						
Nickel	ug/L	2.82 J	0.589 J						

Notes:
ft bgs = feet below ground surface
MV = millivolts
NTU = nephelometric turbidity units
ug/L = micrograms per liter
umhos/cm = micromhoms per centimeter

CCR Well pH Results - 2015

Appendix F
CCR Well pH Results – 2015

Location ID	Date	Screened Inverval (ft bgs)	pH
GP1	4/1/2015	6.05-11.05	6.40
	7/18/2015		5.84
GP2	4/1/2015	22.0-27.0	10.37
	7/18/2015		10.23
GP-3	7/18/2015	12.93-17.93	7.36
GP4	4/1/2015	23.4-28.4	8.24
	7/18/2015		7.98
GP5	4/2/2015	22.0-27.0	9.67
	7/18/2015		9.42
GP6	4/3/2015	18.5-23.5	6.76
	7/18/2015		7.21

Notes:
ft bgs = feet below ground surface

Appendix G – Memorandum: Lithium in GAF-526L – Alternate Source Demonstration

AECOM
1600 Perimeter Park Drive, Suite 400
Morrisville, NC 27560

919-461-1100 Telephone
919-461-1415 Fax

Memorandum

To	Tennessee Valley Authority	Page 1
CC		
Subject	Lithium in GAF-526L - Alternate Source Demonstration NRS Treatability Study Gallatin Fossil Plant, Non-Registered Site (NRS)	
From	Chris Garlington, PG A Elizabeth Perry, PG	
Date	December 7, 2020	

This memorandum documents the Alternate Source Demonstration (ASD) conducted by AECOM on behalf of the Tennessee Valley Authority (TVA) for the Treatability Study at the Gallatin Fossil Plant (GAF) Non-Registered Site (NRS). This evaluation shows that the single lithium concentration above the Lebanon Limestone statistical background in well GAF-526L is due to natural groundwater conditions, and not a release from the NRS.

Background

AECOM is currently conducting a Treatability Study at the NRS on behalf of TVA. To identify which parameters require treatment, groundwater concentrations were compared to Groundwater Protection Standards (GWPSs). Typically, GWPSs are only exceeded in wells screened in the alluvium overburden. Lithium is the only parameter present above its published GWPS (40 ug/l) in NRS bedrock wells. At GAF, background concentrations of lithium in the limestone bedrock have previously been shown to be above the published GWPS, and a site-specific GWPS of 189 ug/l was developed for the Lebanon Limestone L1 fracture zone (AECOM, 2019). One bedrock well at the NRS (GAF-526L) has had a lithium concentration above this site-specific GWPS.

The lithium results from the three sampling events at GAF-526L are summarized in the table below. Only one of the three results is above the background-based GWPS.

Well ID	Parameter	Lebanon Limestone GWPS (ug/l)	Sample Date and Concentration (ug/l)
GAF-526L	Lithium	189	Dec. 2018: 194 Jan. 2019: 184 Feb. 2019: 157

Notes:
Concentrations shown are from unfiltered samples.
Background GWPS was calculated as an upper prediction limit (UPL) from CCR Rule background well baseline data (8 events).
Underlined values indicate a result in exceedance of the background UPL.

This memo demonstrates that the lithium in GAF-526L is not from the NRS and not associated with the low pH conditions being addressed in the Treatability Study. Instead, it is naturally occurring.

NRS Area as a Potential Source

Multiple lines of evidence were considered to evaluate whether the NRS could be the source of the lithium detected in well GAF-526L. The evaluations are summarized below.

CCR Porewater Analysis - As part of the on-going Environmental Investigation Plan (EIP), wells were installed and screened in CCR within the NRS to characterize the chemistry of the porewater, and to help assess potential impacts of the CCR on groundwater. The lithium concentrations from the CCR porewater sampling are summarized in the table below.

Parameter	NRS CCR Porewater Range (ug/l)	GAF-526L Groundwater Range (ug/l)
Lithium	31.2 J – 48.5	157 – 194

Notes:
Concentrations shown are from unfiltered samples.
CCR Porewater range from samples collected from GAF-439A and GAF-440AR.

Because the concentrations in the NRS porewater are much lower than in the well, the CCR cannot be the source of the lithium in the well.

In addition, if the NRS CCR were the source of the lithium in GAF-526L, concentrations would be expected to be greatest nearest to the potential source (the CCR) and would be expected to decrease with distance from the source. For example, concentrations would be expected to decrease with depth. GAF-526L is the deepest well in the vicinity of the NRS. The lithium concentrations in all the shallower bedrock wells (e.g., 26, 27) are lower and do not exceed the site-specific GWPS. This fact indicates that the CCR in the NRS is an unlikely source for the lithium in this well.

Assessment of Low pH Conditions - In addition to the CCR within the NRS, there is also a source of low pH in the area, believed to be caused by weathering of pyrites. Available data shows that the low pH is only present in a few wells screened in overburden; wells screened in the underlying Lebanon limestone do not have low pH. The range of pH observed within GAF-526L is shown in the following table.

Well ID	Parameter	Results Range (S.U.)
GAF-526L	pH	7.23 – 7.51

Note: The pH range is from the three samples collected in GAF-526L from Dec. 2018 through Feb. 2019.

This data shows that the water at GAF-526L is within the normal (neutral) pH range and does not exhibit low pH conditions. Therefore, low pH conditions are unlikely to have contributed to the lithium in GAF-526L.

Naturally Occurring Lithium

Since the conditions at the NRS have been ruled out as the potential source for the lithium at GAF-526L, the following section outlines why natural groundwater chemistry and variability are the likely source of the lithium found at this well.

The following table shows that the single lithium concentration in GAF-526L over the GWPS (194 ug/l) falls within the range of published values for naturally occurring lithium found in groundwater of the Central Basin Aquifer of Tennessee, where Gallatin is located.

Central Basin Aquifer Data Source	Lithium Concentration Range (ug/l)	Data Reference
USGS databases, Ordovician aquifers	**< 4 – 540**	**National Water Information System (NWIS)**
Central Basin aquifer study	**< 4 – 430**	**Hileman, 1990; Hileman and Lee, 1993**

Note: USGS NWIS database likely includes some of the samples from the Central Basin Aquifer study.

In addition to the published information on the Central Basin Aquifer water chemistry, TVA also has site-specific information obtained during the EIP from wells located to the north of the GAF site in locations that cannot be affected by GAF operations.

Location ID	Lithium Concentration Range (ug/l)
Private Well 138E	580
GAF-515L	265 – 710
GAF-516L	235 – 414

Notes:
Concentrations shown are from unfiltered samples. GAF-515L was sampled 9 times between January 2019 and November 2019; GAF-516L was sampled 6 times between June 2019 and November 2019.
Private well 138E sampled in December 2016; results presented in WSW Memo 11/2017 prepared by HAI.

This data also supports the determination that the lithium concentration within GAF-526L is naturally occurring. As can be seen on the table above, all lithium results from these off-site wells north of the GAF plant are above both the calculated background UPL (189 ug/l) and the maximum result from GAF-526L (194 ug/l). In addition, the maximum concentrations in 2 of the 3 wells are also above the published maximum values for lithium in the Central Basin Aquifer system. This indicates that the full range of natural groundwater variability at the GAF site was not captured in the background dataset used to statistically generate the site-specific Lebanon limestone GWPS.

Well GAF-526L is screened deep within the Lebanon limestone, deeper than both the L1 and L2 fracture zones. As a result, it is likely that this deep groundwater has had a longer contact time with the limestone bedrock which would allow for more lithium to dissolve into the groundwater. It is common to see increased metals concentrations in older groundwater with longer bedrock contact time.

Finally, the dataset from GAF-526L is statistically small (3 results). If the dataset were larger (e.g., 8 results), it would allow for a statistical calculation of a Lower Confidence Limit (LCL) which would be used for a statistical comparison with the GWPS. Based on the three results we do have from this well (which exhibit a decreasing concentration trend), it is likely that this hypothetical statistical calculation would not confirm a statistical exceedance of the GWPS.

Summary

This evaluation has shown that the single Lebanon Limestone UPL exceedance observed in NRS well GAF-526L is due to natural groundwater conditions, and is not related to the NRS or the low pH conditions, based on the following lines of evidence.

Lithium concentrations in the NRS porewater are significantly lower (about a third) than the concentrations in the well, so the NRS cannot be the source. In addition, the low pH conditions that are mobilizing some metals in the overburden do not extend into the limestone bedrock, and so are unlikely to be contributing lithium to this bedrock well.

The concentrations of lithium in GAF-526L are only slightly above the site-specific background, and are consistent with the regional ranges for the Central Basin Aquifer System and other wells located north of GAF. This consistency demonstrates that the lithium is naturally occurring in this well screened deep in the Lebanon Limestone.

References

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