APPENDIX F – BACKGROUND SOIL INVESTIGATION

APPENDIX F.1

BACKGROUND SOIL INVESTIGATION SAMPLING AND ANALYSIS REPORT

Cumberland Fossil Plant
Background Soil Investigation
Sampling and Analysis Report

TDEC Commissioner's Order
Environmental Investigation Plan
Cumberland Fossil Plant
Cumberland City, Tennessee

August 21, 2020

Prepared for:

Tennessee Valley Authority
Chattanooga, Tennessee

Prepared by:

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Revision Record

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Sign-off Sheet

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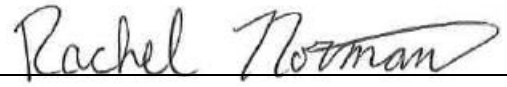
Prepared by 

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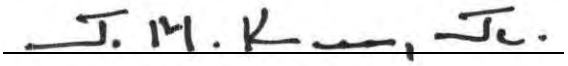
Reviewed by 

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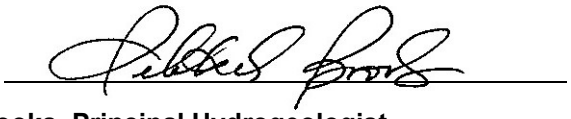
Approved by 

Rebekah Brooks, Principal Hydrogeologist

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Abbreviations

ASTM	American Society for Testing and Materials
BGS	Background Soil
CCR	Coal Combustion Residuals
CCR Parameters	Constituents listed in Appendix III and IV of 40 CFR 257 and five inorganic constituents included in Appendix I of Tennessee Rule 0400-11-01-04
CEC	Civil & Environmental Engineering Consultants, Inc.
COC	Chain-of-Custody
CUF Plant	Cumberland Fossil Plant
DPT	Direct Push Technology
EAR	Environmental Assessment Report
EnvStds	Environmental Standards, Inc.
ft bgs	Feet below ground surface
GPS	Global Positioning System
HSA	Hollow Stem Auger
ID	Identification
IDW	Investigation Derived Waste
PG	Professional Geologist
PLM	Polarized Light Microscopy
QAPP	Quality Assurance Project Plan
QC	Quality Control
RJ Lee	RJ Lee Group, Inc.
SAP	Sampling and Analysis Plan
SAR	Sampling and Analysis Report
Stantec	Stantec Consulting Services Inc.
TDEC	Tennessee Department of Environment and Conservation
TDEC Order	Commissioner’s Order No. OGC15-0177
TestAmerica	TestAmerica Laboratories, Inc.
TI	Technical Instruction
TVA	Tennessee Valley Authority

1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) has prepared this sampling and analysis report (SAR) on behalf of the Tennessee Valley Authority (TVA) to document activities related to a Background Soil (BGS) Investigation at TVA's Cumberland Fossil (CUF) Plant located in Cumberland City, Tennessee (Exhibit A.1).

The purpose of the BGS Investigation is to collect soil samples to evaluate the background soil conditions at the CUF Plant in support of fulfilling the requirements for the Tennessee Department of Environment and Conservation (TDEC) issued Commissioner's Order No. OGC15-0177 (TDEC Order) to TVA (TDEC 2015). The TDEC Order sets forth a "process for the investigation, assessment, and remediation of unacceptable risks" at TVA's coal ash disposal sites in Tennessee.

The purpose of this SAR is to document the work completed during background soil sampling and to present the information and data collected during the execution of the Background Soil Investigation Sampling and Analysis Plan (SAP) (Stantec 2018a). This SAR is not intended to provide conclusions or evaluations of results. The scope of the BGS investigation represented herein was conducted pursuant to the SAP and is part of a larger environmental investigation at the CUF Plant. The evaluation of the results will consider other aspects of the environmental investigation, as well as data collected under other State and/or coal combustion residuals (CCR) programs, and will be presented in the Environmental Assessment Report (EAR).

The BGS Investigation activities were performed in general accordance with the following documents developed by TVA to support fulfilling the requirements of the TDEC Order at the CUF Plant:

- *Environmental Investigation Plan (EIP)* (Stantec 2018b)
- *Background Soil SAP* (Stantec 2018a)
- *Hydrogeological Investigation SAP* (Stantec 2018c)
- *Quality Assurance Project Plan (QAPP)* (Environmental Standards, Inc. 2018).

The background soil and hydrogeologic investigations were implemented in accordance with TVA- and TDEC-approved Programmatic and Project-specific changes. Minor variations in scope and procedures from those outlined in the Background Soil SAP and the Hydrogeological Investigation SAP occurred during field activities due to field conditions and programmatic updates, and are referenced in Section 3.6.

The BGS sampling activities were completed in two field mobilization phases. Phase I field sampling activities were performed from August 21 through 28, 2018, and Phase II field sampling activities were performed from November 29 through December 6, 2018. Additional BGS samples were collected between November 29, 2018 and April 10, 2019 as part of the hydrogeological investigation during

background groundwater monitoring well installation as described in the Hydrogeological Investigation SAP.

Laboratory analysis of constituents was performed by TestAmerica Laboratories, Inc (TestAmerica) in Nashville, Tennessee, Pittsburgh, Pennsylvania, and St. Louis, Missouri (radium samples only) and by RJ Lee Group, Inc. (RJ Lee) in Monroeville, Pennsylvania (percent ash). Additional Quality Assurance oversight on data acquisition protocols, sampling practices, and data validation or verification was performed by Environmental Standards, Inc. (EnvStds) under direct contract to TVA.

2.0 OBJECTIVE AND SCOPE

The primary objective of the BGS Investigation conducted pursuant to the Background Soil SAP is to collect soil samples for characterization of the background soils on TVA property within the vicinity of the CUF Plant in response to the TDEC Order. The approach for the investigation was to:

- Identify locations where naturally occurring, in-situ, native soils unaffected by CCR material are present
- Mobilize a track mounted direct push technology (DPT) rig to staked boring locations approved by TDEC and considered suitable for the DPT rig to safely drill into the native underlying soils
- Advance the DPT rig and collect background soil samples for analyses
- Collect background soil samples from the well screen intervals of the background monitoring wells as part of the hydrogeological investigation scope of work.

The scope of work for the BGS Investigation consisted of the following tasks:

- Verifying and documenting proposed sampling locations using global positioning system (GPS) survey
- Collecting field measurements of soil pH
- Collecting soil samples for laboratory analysis of CCR parameters as described in the SAPs.

These activities were carried out concurrently with advancement of the soil borings.

3.0 FIELD ACTIVITIES

BGS investigation field activities were conducted between August 21, 2018 and December 6, 2018. Additionally, under the hydrogeological investigation scope of work, three background monitoring well borings were drilled between November 29, 2018 and April 10, 2019. Soil samples were collected from the three background monitoring well borings and are included with the BGS investigation. Prior to initiating field activities, TVA conducted environmental reviews, obtained permits, and performed utility clearances as necessary to complete the field work.

Stantec performed soil sample collection activities based on guidance and specifications listed in TVA's Technical Instructions (TIs), the SAPs, and the QAPP (EnvStds 2018), except as noted in the Variations section of this report. As part of TVA's commitment to generate representative and reliable data, oversight of field activities, field documentation, centralized data management, and data validation or verification of laboratory analytical data was performed by EnvStds under direct contract with TVA. In addition, Civil and Environmental Consultants, Inc. (CEC), contracted with TDEC, collected split soil samples at two boring locations (CUF-BG05 and CUF-BG15). Additional details of the CEC sample collection are provided in Section 3.3.1.

During the BGS investigation, Stantec conducted the following field activities:

- Verified sampling locations using the GPS
- Collected GPS measurements
- Collected soil samples from 17 BGS boring locations and three background monitoring well locations (hydrogeological investigation scope of work)
- Recorded field measurements of soil pH parameters at the 20 sampled boring/well locations
- Collected quality control (QC) samples, including five matrix spike/matrix spike duplicate/lab duplicate, five field duplicates, 13 field blanks, and six equipment blanks
- Conveyed collected samples via laboratory-provided courier service to TestAmerica and via Federal Express shipment to RJ Lee for analysis.

Details on each activity are presented in the sections below.

3.1 WORK LOCATIONS

The BGS investigation field activities were conducted at 17 locations at the CUF Plant under the BGS investigation scope of work and three locations at the CUF Plant under the hydrogeological investigation scope of work. The BGS investigation boring locations are shown on Exhibit A.2. A list of the BGS investigation borings and associated soil samples is included in Table B.1.

3.1.1 Soil Horizons

Surficial soil samples were typically collected at depths ranging from 0.0 to 0.5 feet below ground surface (ft bgs). Along with surficial samples, the field sampling personnel collected approximately two feet of soil from each five-foot soil run (one foot in both directions from the midpoint of the five-foot interval) for the total depth of the boring. In cases where recovery was less than five feet, the FSP collected the two-foot sample interval generally from either the mid-point of the recovered interval or from the entire recovered interval, if recovery was about 2.5 feet or less. Samples were collected from multiple soil depths to provide data for vertical characterization of background soils.

3.2 DOCUMENTATION

Stantec planned the BGS investigation activities per ENV-TI-05.08.01, *Planning Sampling Events* and maintained field documentation in general accordance with TVA TI ENV-TI-05.80.03, *Field Record Keeping* and the QAPP. Field activities and data were primarily recorded on program-specific field forms. Health and safety forms were completed in accordance with TVA and Stantec health and safety requirements. Additional information regarding field documentation is provided below.

3.2.1 Field Forms

Stantec used program-specific field forms to record field observations and data for specific activities. Field forms used during the BGS investigation included:

- *Daily Field Activity Log*
- *Subsurface Log*
- *Soil pH Calibration and Inspection Log*
- *Soil pH Data Form*
- *Chain-of-Custody (COC).*

3.2.1.1 Daily Field Activity Log

Stantec field sampling personnel recorded daily field activities, observations and data on a *Daily Field Activity Log* to chronologically document the field program on digital media and hard copy field forms (*Subsurface Log* only). Deviations from the SAPs or QAPP were also documented on the *Daily Field Activity Log*.

3.2.1.2 Subsurface Log

A Professional Geologist (PG) licensed in the State of Tennessee prepared a *Subsurface Log* for each boring. The log documented time, boring location, drilling personnel, tooling/equipment used, depth to water, sample number, sample recovery, Standard Penetration Test blow counts (not recorded when DPT

rig was used), subsurface lithology and other relevant observations. Soil color was logged per the appropriate Munsell soil color chart (Munsell Color 2009). The Subsurface Logs are provided in Appendix C.

3.2.1.3 Soil pH Calibration and Inspection Log

Stantec field sampling personnel recorded daily pH meter calibrations and inspections on a Soil pH Calibration and Inspection Log. The log documented temperature, temperature verification, temperature-adjusted calibration values, post calibration pH values, and calibration solution details. Additional information on equipment calibration is provided in Section 3.2.2.

3.2.1.4 Soil pH Data Form

Stantec field sampling personnel prepared a Soil pH Data Form for each day that soil pH measurements were taken. The form documented the sample identification (ID), boring ID, the depth range, pH measurement date and time, and the field pH value.

3.2.1.5 Chain-of-Custody

Stantec field sampling personnel completed *COC* documentation for each soil sample collected during the BGS Investigation. The sample ID, sample location, sample depth (if applicable), type of sample, sampling date, and time were recorded on the *COCs*. The Field Team Leader reviewed the *COCs* for completeness, and a QC check of samples in each cooler compared to sample IDs on the corresponding *COC* was conducted prior to submittal to the laboratory. *COCs* were completed in general accordance with *ENV-TI-05.80.02: Sample Labeling and Custody*.

3.2.2 Equipment Calibration

Field instruments used to collect, generate, or measure environmental data were calibrated each day prior to sampling as specified by the SAPs, QAPP, and Stantec Standard Operating Procedure - REV 1 for the ExTech Exstik 110 meter (Stantec 2018d). Temperature was recorded using a calibrated National Institute of Standards and Technology traceable thermometer. Additional details regarding equipment calibration were recorded on the *Soil pH Calibration and Inspection Logs*.

3.2.3 Photographs

Photographs of the soil cores from boring activities were taken during the BGS investigation. Photographic logs of subsurface BGS borings are provided in Appendix D.

3.3 SOIL BORING AND SAMPLING

3.3.1 Soil Borings

The BGS investigation borings were advanced by S&ME, Inc., under Stantec oversight, using their Geoprobe 7730 DPT rig equipped with the DT37 dual tube tooling system. The background monitoring

wells, completed under the hydrogeological investigation, were advanced by Stantec with a CME 850/950 hollow stem auger (HSA) drill with a three-inch spilt-spoon attached per American Society for Testing and Materials (ASTM) *D6151-08: Standard Practice for Using Hollow-Stem Augers for Geotechnical Exploration and Soil Sampling,* to collect additional sample volume for analysis, with the exception of CUF-1001 (boring name CUF-1001Alt2). During soil sampling activities at the CUF-1001 location, a standard two-inch split spoon was utilized.

The BGS investigation borings were advanced in two phases: Phase I - August 21 - 28, 2018 and Phase II -November 29 – December 6, 2018. Additional BGS samples were collected November 29, 2018 - April 10, 2019 as part of the hydrogeological investigation. Locations are shown on Exhibit A.2. The two BGS mobilizations were necessary to complete the defined scope of work. During the Phase I mobilization, several BGS investigation boring locations were under environmental review and had not yet been cleared with a categorical exclusion checklist and therefore did not have an issued excavation permit. Following Phase I, five additional BGS investigation borings (CUF-BG13 through CUF-BG17) were added to the scope of work to meet the objectives of the SAP. The remaining and additional BGS investigation borings were completed during Phase II. Offset soil borings from the staked locations were advanced in a fifty-foot radius for Phase I and a twenty-foot radius for Phase II where shallow bedrock was encountered at the initial boring locations, as discussed below.

A summary of BGS investigation borings advanced and soil samples collected is included in Table B.1 and the locations of the BGS investigation borings are shown on Exhibit A.2. BGS investigation borings were advanced in the following chronological sequence:

- CUF-BG07 – The original location of CUF-BG07 was moved with TDEC approval because it was within an environmentally sensitive area. On August 21, 2018, the DPT rig mobilized to location CUF-BG07. The DPT rig advanced two soil borings at this location. Refusal was encountered at 12.0 ft bgs (first boring) and at 18.0 ft bgs (second boring). The deepest boring, 18.0 ft bgs, was logged and sampled as CUF-BG07.

- CUF-BG02 – On August 22, 2018, the DPT rig mobilized to location CUF-BG02. The DPT rig advanced three soil borings at this location. Refusal was encountered at 2.5 ft bgs (first boring), at 7.6 ft bgs (second boring), and at 6.3 ft bgs (third boring). The deepest boring, 7.6 ft bgs, was logged and sampled as CUF-BG02.

- CUF-BG03 – On August 22, 2018 the DPT rig mobilized to location CUF-BG03. The DPT rig advanced four soil borings at this location. Refusal was encountered at 7.4 ft bgs (first boring), 2.8 ft bgs (second boring), 2.2 ft bgs (third boring) and 2.1 ft bgs (fourth boring). The deepest boring, 7.4 ft bgs, was logged and sampled as CUF-BG03. The depth to bedrock was confirmed with an auger rig. The auger rig hit refusal at 7.4 ft bgs.

- CUF-BG04 – On August 23, 2018 the DPT rig mobilized to location CUF-BG04. The DPT rig advanced three soil borings at this location. Refusal was encountered at 7.3 ft bgs (first boring), at 7.2 ft bgs (second boring), and at 11.4 ft bgs (third boring). The deepest boring, 11.4 ft bgs, was logged and sampled as CUF-BG04.

- CUF-BG09 – On August 23, 2018 the DPT rig mobilized to location CUF-BG09. The DPT rig advanced two soil borings at this location. Refusal was encountered at 12.6 ft bgs (first boring) and at 20.8 ft bgs (second boring). The deepest boring, 20.8 ft bgs, was logged and sampled as CUF-BG09.

- CUF-BG08 – On August 24, 2018 the DPT rig mobilized to location CUF-BG08. The DPT rig advanced three soil borings at this location. Refusal was encountered at 12.0 ft bgs (first boring), at 11.5 ft bgs (second boring), and at 9.5 ft bgs (third boring). The deepest boring, 12.0 ft bgs, was logged and sampled as CUF-BG08.

- CUF-BG01 – On August 27, 2018 the DPT rig mobilized to location CUF-BG01. The DPT rig advanced three soil borings at this location. Refusal was encountered at 12.3 ft bgs (first boring), at 6.0 ft bgs (second boring), and at 25.0 ft bgs (third boring). The deepest boring, 25.0 ft bgs, was logged and sampled as CUF-BG01.

- CUF-BG13 – On August 28, 2018 the DPT rig mobilized to location CUF-BG13. The DPT rig advanced five soil borings at this location. Refusal was encountered at 5.4 ft bgs (first boring), at 4.5 ft bgs (second boring), at 3.0 ft bgs (third boring), at 5.8 ft bgs (fourth boring), and at 10.1 ft bgs (fifth boring). The deepest boring, 10.1 ft bgs, was logged and sampled as CUF-BG13.

- CUF-BG14 – On August 28, 2018 the DPT rig mobilized to location CUF-BG14. The DPT rig advanced four soil borings at this location. Refusal was encountered at 5.6 ft bgs (first boring), at 1.1 ft bgs (second boring), at 5.0 ft bgs (third boring), and at 12.6 ft bgs (fourth boring). The deepest boring, 12.6 ft bgs, was logged and sampled as CUF-BG14.

- CUF-BG05 – The original location of CUF-BG05 was moved with TDEC approval because it was within an environmentally sensitive area. On November 29, 2018 the DPT rig mobilized to location CUF-BG05. The DPT rig advanced two soil borings at this location. Refusal was encountered at 15.6 ft bgs (first boring) and a second boring was drilled fourteen inches northwest of the first boring to obtain sufficient sampling volume to split samples with CEC. The first boring, 15.6 ft bgs, was logged and sampled as CUF-BG05 for the BGS investigation.

  CEC collected split samples from 2.5 to 4.5 ft bgs and 6.5 to 8.5 ft bgs at CUF-BG05.

- CUF-BG15 – On November 29, 2018 the DPT rig mobilized to location CUF-BG15. The DPT rig advanced two soil borings at this location. Refusal was encountered at 9.4 ft bgs (first boring) and a second boring was drilled fourteen inches northwest of the first boring to obtain sufficient sampling volume to split samples with CEC. The first boring, 9.4 ft bgs, was logged and sampled as CUF-BG15 for the BGS investigation.

  CEC collected split samples from 1.9 to 3.9 ft bgs at CUF-BG15.

- CUF-1000ALTA – On November 29, 2018 the HSA rig mobilized to location CUF-1000 ALT. The HSA rig advanced two soil borings at this location. Refusal was encountered at 9.9 ft bgs with no water production (first boring). The soil boring was moved 20 feet to the east at CUF-1000 ALTA where refusal was encountered at 22.4 ft bgs (second boring). The deepest boring, 22.4 ft bgs, was logged and sampled as CUF-1000ALTA and background monitoring well CUF-1000 was installed at this boring location. Monitoring well installation activities are summarized in the Hydrogeological Investigation SAR.

- CUF-BG17 – On November 30, 2018 the DPT rig mobilized to location CUF-BG17. The DPT rig advanced one soil boring at this location. Refusal was encountered at 16.9 ft bgs. The boring was logged and sampled as CUF-BG17.

- CUF-BG16 – On December 3, 2018 the DPT rig mobilized to location CUF-BG16. The DPT rig advanced one soil boring at this location. Refusal was encountered at 6.8 ft bgs. The boring was logged and sampled as CUF-BG16.

- CUF-BG06 – On December 4, 2018 the DPT rig mobilized to location CUF-BG06. The DPT rig advanced three soil borings at this location. Refusal was encountered at 6.4 ft bgs (first boring), at 6.7 ft bgs (second boring) and at 8.8 ft bgs (third boring). The deepest boring, 8.8 ft bgs, was logged and sampled as CUF-BG06.

- CUF-1004ALT2A – On December 4, 2018 the HSA rig mobilized to location CUF-1004ATL2. The HSA rig advanced three soil borings at this location. Refusal was encountered at 8.0 ft bgs (first boring). On December 5, 2018 the HSA rig mobilized to location CUF-1004ALT where refusal was encountered at 19.9 ft bgs (second boring). The boring was moved to 20 feet to the northwest at CUF-1004ALT2A on December 6, 2018. Refusal was encountered at 20.9 ft bgs (third boring). The deepest boring, 20.9 ft bgs, was logged and sampled as CUF-1004ALT2A. A background monitoring well was not installed in this location because saturated conditions were not observed in the overburden.

- CUF-BG10 – The original location of CUF-BG10 was moved with TDEC approval because of access restrictions. On December 5, 2018 the DPT rig mobilized to location CUF-BG10. The DPT rig advanced three soil borings at this location. Refusal was encountered at 7.6 ft bgs (first boring), at 6.9 ft bgs (second boring) and at 4.8 ft bgs (third boring). The deepest boring, 7.6 ft bgs, was logged and sampled as CUF-BG10.

- CUF-BG11 – The original location of CUF-BG11 was moved with TDEC approval because of access restrictions. On December 6, 2018 the DPT rig mobilized to location CUF-BG11. The DPT rig advanced one soil boring at this location. Refusal was encountered at 14.1 ft bgs. The boring was logged and sampled as CUF-BG11.

- CUF-BG12 – The original location of CUF-BG12 was moved with TDEC approval because of access restrictions. On December 6, 2018 the DPT rig mobilized to location CUF-BG12. The DPT

rig advanced one soil boring at this location. Refusal was encountered at 13.8 ft bgs. The boring was logged and sampled as CUF-BG12.

- CUF-1001ALT2 – On December 12, 2018 the HSA rig mobilized to location CUF-1001ALT. The HSA rig advanced two soil borings at this location. CCR material was encountered from 0.0 to 1.5 ft bgs and refusal was encountered at 21.0 ft bgs (first boring). The boring was moved, and refusal was encountered at 22.8 ft bgs (second boring). Groundwater was measured at 22.8 ft bgs. The deepest boring, 22.8 ft bgs, was logged and sampled as CUF-1001ALT. Due to the presence of CCR material in the soil at the CUF-1001ALT location, it was determined that another boring would be completed for this location. On April 9, 2019, the HSA rig mobilized to location CUF-1001ALT2. Refusal was encountered at 18.1 ft bgs. The boring was logged as CUF-1001ALT2 and sampled as CUF-1001 and background monitoring well CUF-1001 was installed at this boring location. Monitoring well installation activities are summarized in the Hydrogeological Investigation SAR.

Following sample collection, described in Section 3.3.2, the borings were backfilled using a 30 percent solids bentonite grout placed by the tremie method to within approximately six inches of the surface. The top six inches were restored to match the surrounding existing conditions.

3.3.2 Soil Sampling

Once advancement of the boring was completed, a Tennessee-licensed PG prepared written field subsurface logs using the *Subsurface Log* form. Each form includes a description of subsurface lithology, sample recovery, color using the Munsell color chart, and other relevant parameters as required by the SAPs and TIs. As part of the logging process, each sample was photographed by field sampling personnel with sample interval data presented on a white board. Analytical and QC samples were collected from the BGS investigation borings and documented in the *Daily Field Activity Log* and COC as shown on Table B.1.

The sampling team typically collected approximately two-foot grab samples from the mid-point of each five-foot soil run based on recovery. The collected soil was placed in clean Ziplock® bags and homogenized using gloved hands and when necessary clean, unused, disposable, or decontaminated sampling tools. Once the sample was sufficiently homogenized, an aliquot of the homogenized sample and deionized water was used to create a soil paste for measurement of the soil pH with the ExTech Exstik 110 pH meter according to Stantec Operating Procedure – REV 1. The measurements were recorded on the *Soil pH Data Form* within 15 minutes after creating the soil paste.

Afterwards, the soil sample was placed in an appropriate laboratory-supplied sample jar. Soil samples were collected in accordance with ENV-TI-05.80.50, *Soil and Sediment Sampling* and ENV-TI-05.80.04, *Field Sampling Quality Control*. Sample containers were labeled and handled in accordance with ENV-TI-05.80.02, *Sample Labeling and Custody*. Field sampling personnel secured caps on each bottle and attached a custody seal across the cap before placing the sample container in a cooler with ice (within 15 minutes of sample collection) for shipment to the laboratory.

The samples were analyzed for CCR-related constituents listed in Appendices III and IV of Title 40 of the Code of Federal Regulations (CFR) Part 257 (40 CFR Part 257). In addition, five inorganic constituents listed in Appendix I of Tennessee Rule 0400-11-01-.04 and not included in the 40 CFR 257 Appendices III and IV were analyzed to maintain continuity with the TDEC environmental programs. These additional TDEC Appendix I constituents included copper, nickel, silver, vanadium, and zinc. The combined federal CCR Appendices III and IV constituents and TDEC Appendix I inorganic constituents are referred to as "CCR Parameters." In addition, surficial soil samples from each BGS investigation boring location were analyzed for the presence of ash (percent ash) by polarized light microscopy (PLM).

3.4 INVESTIGATION DERIVED WASTE

Investigation derived waste (IDW) generated during the BGS investigation included:

- Used calibration solutions
- Soil cuttings
- Personal protective equipment
- Decontamination fluids
- General trash.

Soil cuttings and decontamination water produced during the BGS investigation were discarded to the ground surface as authorized by TVA CUF Plant personnel and in accordance with ENV-TI-05.80.05, *Field Sampling Equipment Cleaning and Decontamination* and the Background Soil SAP. Where CCR materials were encountered during the advancement of the background soil borings, soil cuttings and decontamination water, along with other IDW, were handled in accordance with CUF Plant-specific waste management plan, and local, state, and federal regulations. Transportation and disposal of IDW was coordinated with TVA CUF Plant personnel.

3.5 SAMPLE SHIPMENT

Samples were packed and transported or shipped under *COC* procedures as required by ENV-TI-05.80.06, *Handling and Shipping of Samples* and ENV-TI-05.80.02, *Sample Labeling and Custody*. The soil samples were delivered via courier to TestAmerica in Nashville, Tennessee and then subsequently shipped to TestAmerica in Pittsburgh, Pennsylvania for analysis and TestAmerica in St. Louis, Missouri for radium analysis. The samples to be analyzed for PLM (percent ash) were shipped to RJ Lee located in Monroeville, Pennsylvania. TestAmerica submitted sample receipt forms to Stantec to document the condition in which the samples were received.

3.6 VARIATIONS

The proposed scope and procedures for the BGS investigation was outlined in the SAPs, QAPP, applicable TVA TIs, and ASTM standards as detailed in the sections above. Variations in scope or

procedures discussed with TDEC and/or TVA, changes based on field conditions, or additional field sampling performed to complete the scope of work in the SAPs are described in the following sections. As discussed below, these variations do not impact the overall usability and representativeness of the dataset provided in this SAR for the BGS investigation at the CUF Plant.

3.6.1 Variations in Scope

Variations in scope are provided below.

- Background soil borings CUF-BG05 and CUF-BG07 were relocated because they were within an environmentally sensitive area as approved by TDEC.
- Background soil borings CUF-BG10, CUFBG11, and CUF-BG12 were relocated because of access restrictions as approved by TDEC.
- Five background soil boring locations (CUF-BG13 through CUF-BG17) were approved by TDEC and added to the investigation to supplement the background data and meet the objectives of the SAP.

3.6.2 Variations in Procedures

Variations in procedures occurring in the field are provided below.

- The individual container custody seals were not used on field blank samples on August 21, 2018 due to an insufficient quantity of seals available from the laboratory; however, the shipping cooler custody seals were intact and sample containers were in acceptable condition upon receipt by the laboratory.
- Field pH for surficial soil samples was measured but not recorded for the samples from two soil borings: CUF-BG02 (0-0.5 ft bgs) and CUF-BG03 (0-0.5 ft bgs) on August 22, 2018; however, soil samples collected from these boring intervals were submitted to the laboratory for pH testing.
- A field blank was not collected on April 10, 2019 when the BGS sample from the well screen interval of CUF-1001ALT2 was homogenized and placed into sample containers; however, a field blank was collected the previous day when the samples were being collected from the split spoons.
- A pH of the sample collected from the well screen interval of CUF-1001ALT2 was taken after placing the soil sample into the laboratory sample containers on April 10, 2019, instead of being taken prior to containerizing as specified in the SAPs; however, soil samples collected from these boring intervals were also submitted to the laboratory for pH testing.

4.0 SUMMARY

The BGS investigation included collecting soil analytical samples to assess CCR Parameters and ash. A total of 78 samples, including five duplicate samples, were collected from the 17 BGS borings (CUF-BG01 through CUF-BG17) and three background well borings (CUF-1000, CUF-1001, and CUF-1004) and analyzed for CCR Parameters. Surficial soil samples from each BGS investigation boring location were analyzed for the presence of ash (percent ash) by PLM. Soil samples were also tested for pH in the field.

A summary of samples collected, along with duplicates, is presented in Table B.1 in Appendix B. The soil analytical data are presented in Tables B.2 and B.3, and the field soil pH data are summarized in Table B.4. Analytical data were reported by TestAmerica and RJ Lee and validated by EnvStds.

Stantec has completed the BGS investigation at the CUF Plant in Cumberland City, Tennessee, in accordance with the Background Soil Investigation and Hydrogeological Investigation SAPs as documented herein. The data collected during the BGS investigation are usable for reporting and evaluation in the EAR and meet the objectives of the TDEC Order EIP. The complete dataset from this investigation will be evaluated along with data collected under other TDEC Order SAPs, as well as data collected under other State and CCR programs. This evaluation will be provided in the EAR.

5.0 REFERENCES

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TVA. ENV-TI-05.80.02, *Sample Labeling and Custody*.

TVA. ENV-TI-05.80.03, *Field Record Keeping*.

TVA. ENV-TI-05.80.04, *Field Sampling Quality Control.*

TVA. ENV-TI-05.80.05, *Field Sampling Equipment Cleaning and Decontamination*.

TVA. ENV-TI-05.80.06, *Handling and Shipping of Samples*.

TVA. ENV-TI-05.80.50, *Soil and Sediment Sampling*.

APPENDIX A - EXHIBITS

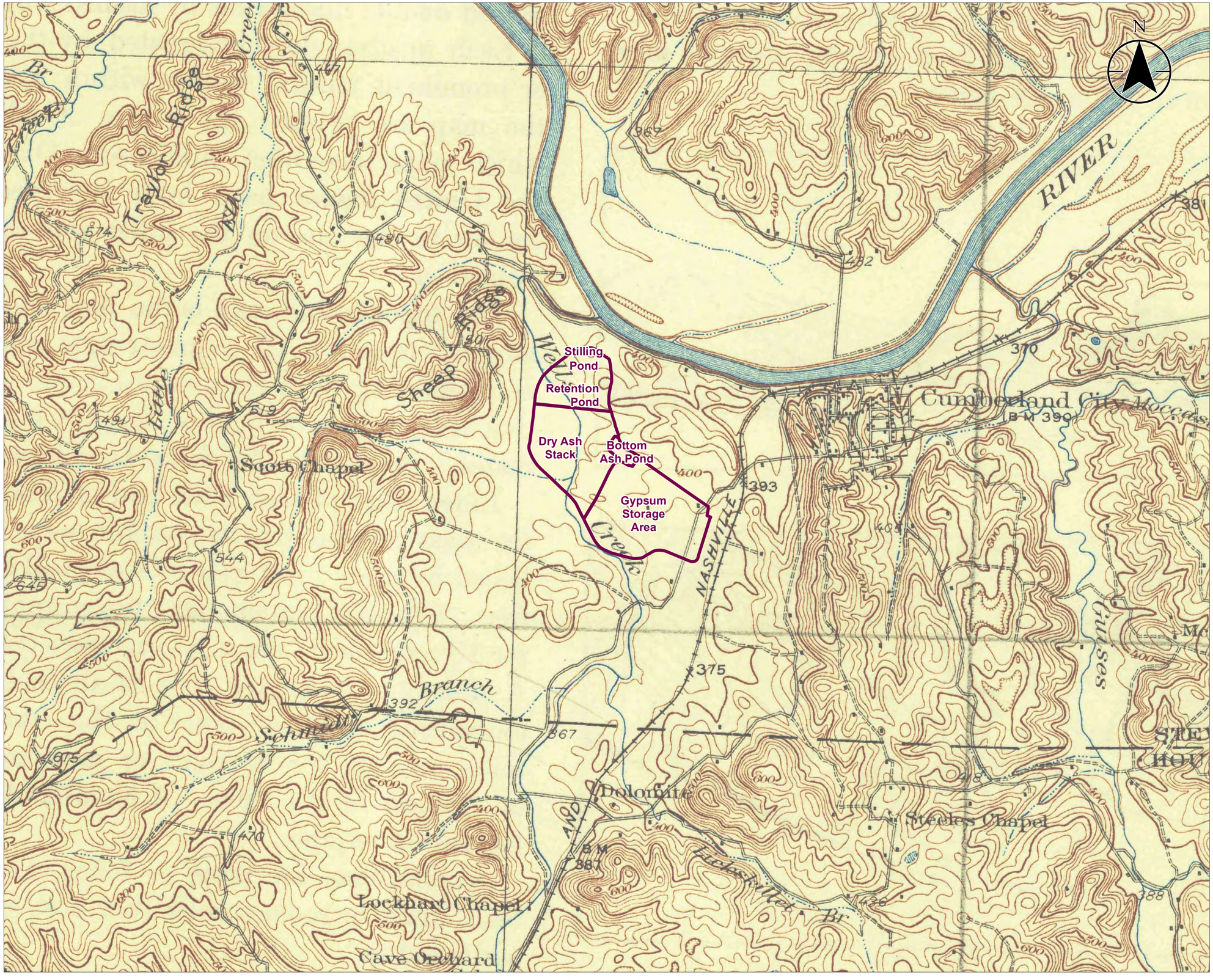


Exhibit No.

A.1

Title

Site Location Map - USGS (1931)

Client/Project

Tennessee Valley Authority
Cumberland Fossil Plant

Project Location

Stewart County, Tennessee

175566329
Prepared by LMB on 2019-10-23
Technical Review by SG on 2019-10-23

0 1,250 2,500 3,750 5,000 Feet

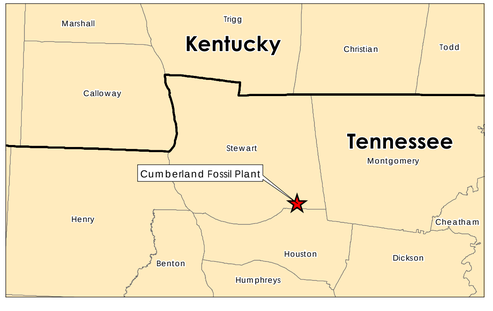
1:15,000 (At original document size of 22x34)

Legend

CCR Unit Area (Approximate)

Notes

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Topographic mapping corresponds to the Erin Quadrangle (Edition of 1931, Scale 1:62,500)
3. Spring locations are approximate and referenced from Law (1992b)



Stantec

TVA

Exhibit No.

A.2

Title

Background Soil Boring Location Map

Client/Project

Tennessee Valley Authority
Cumberland Fossil Plant

Project Location

Stewart County, Tennessee

175568209

Prepared by DMB on 2020-05-28
Technical Review by ES on 2020-05-28

0 600 1,200 1,800 2,400 Feet

1:7,200 (At original document size of 22x34)

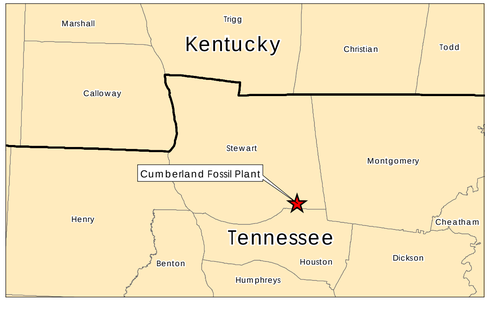
Legend

- Background Soil Boring — BGS Id
- Drilled and Abandoned Borehole — Boring Name
- Background Monitoring Well — Well Name / Boring Name
- CCR Unit Area (Approximate)

N

Notes

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Imagery Provided by Tuck Mapping (c. 2017)
3. Each inset outline color correlates with the same color extent shown in the main figure.
4. CUF-1001ALT had soil samples that were collected and submitted for analysis prior to the subsequent abandonment of the location.
5. Sample collected from boring CUF-1001ALT2 was labeled CUF-BS-CUF1001-12.0/16.5-20190410.



Stantec

TVA

APPENDIX B - TABLES

TABLE B.1 – Summary of Background Soil Samples
Cumberland Fossil Plant
August 2018 - April 2019

			Analysis Type						
Location ID	**Sample ID**	**Sample Type**	% Ash	Total Metals	Total Mercury	Anions	pH (laboratory)	pH (field)	Radium-226, Radium-228, Radium-226+228
CUF-1000ALTA	CUF-BS-CUF1000ALTA-13.5/15.0-20181129	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-CUF1000ALTA-18.0/19.5-20181129	Normal Environmental Sample		x	x	x	x	x	x
CUF-1001ALT	CUF-BS-CUF-1001ALT-13.5/15.0-20181212	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-CUF-1001ALT-19.5/21.0-20181213	Normal Environmental Sample		x	x	x	x	x	x
CUF-1001ALT2	CUF-BS-CUF1001-12.0/16.5-20190410	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-DUP01-20190410	Field Duplicate Sample		x	x	x	x		x
CUF-1004ALT2A	CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG01	CUF-BS-BG01-0.0/0.5-20180827	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG01-1.0/3.0-20180827	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG01-6.5/8.5-20180827	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG01-11.5/13.5-20180827	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG01-16.5/18.5-20180827	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG01-21.5/23.5-20180827	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG02	CUF-BS-BG02-0/0.5-20180822	Normal Environmental Sample	x	x	x	x	x		x
	CUF-BS-BG02-1.5/3.5-20180822	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG02-5.0/7.6-20180822	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG03	CUF-BS-BG03-0/0.5-20180822	Normal Environmental Sample	x	x	x	x	x		x
	CUF-BS-BG03-1.2/3.2-20180822	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG03-5.2/7.2-20180822	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG04	CUF-BS-BG04-0.0/0.5-20180823	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG04-1.5/3.5-20180823	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG04-6.5/8.5-20180823	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG04-10.0/11.4-20180823	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG05	CUF-BS-BG05-0.0/0.5-20181129	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG05-2.5/4.5-20181129	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG05-6.5/8.5-20181129	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG05-11.5/13.5-20181129	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG06	CUF-BS-BG06-0.0/0.5-20181204	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG06-0.5/2.5-20181204	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG06-6.8/8.8-20181204	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG07	CUF-BS-BG07-0/0.66-20180821	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG07-1.5/3.5-20180821	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG07-6.1/8.1-20180821	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG07-11.6/13.6-20180821	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG07-15.5/17.5-20180821	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG08	CUF-BS-BG08-0.0/0.5-20180824	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG08-0.9/2.9-20180824	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-FD01-20180824	Field Duplicate Sample		x	x	x	x		x
	CUF-BS-BG08-6.5/8.5-20180824	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG08-10.0/12.0-20180824	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG09	CUF-BS-BG09-0.0/0.5-20180823	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG09-1.5/3.5-20180823	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG09-6.5/8.5-20180823	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG09-11.5/13.5-20180823	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG09-16.5/18.5-20180823	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG10	CUF-BS-BG10-0.0/0.5-20181205	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-DUP02-20181205	Field Duplicate Sample	x	x	x	x	x		x
	CUF-BS-BG10-1.0/3.0-20181205	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG10-5.6/7.6-20181205	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG11	CUF-BS-BG11-0.0/0.5-20181206	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG11-1.0/3.0-20181206	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG11-6.5/8.5-20181206	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG11-11.2/13.2-20181206	Normal Environmental Sample		x	x	x	x	x	x

See notes on last page.

TABLE B.1 – Summary of Background Soil Samples
Cumberland Fossil Plant
August 2018 - April 2019

			Analysis Type						
Location ID	**Sample ID**	**Sample Type**	% Ash	Total Metals	Total Mercury	Anions	pH (laboratory)	pH (field)	Radium-226, Radium-228, Radium-226+228
CUF-BG12	CUF-BS-BG12-0.0/0.5-20181206	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG12-2.5/4.5-20181206	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG12-6.5/8.5-20181206	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG12-10.6/12.6-20181206	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG13	CUF-BS-BG13-0.0/0.5-20180828	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-FD02-20180828	Field Duplicate Sample	x	x	x	x	x		x
	CUF-BS-BG13-0.75/2.75-20180828	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG13-6.5/8.5-20180828	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG14	CUF-BS-BG14-0.0/0.5-20180828	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG14-1.0/3.0-20180828	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG14-6.5/8.5-20180828	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG14-10.3/12.3-20180828	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG15	CUF-BS-BG15-0.0/0.5-20181129	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG15-1.9/3.9-20181129	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-DUP01-20181129	Field Duplicate Sample		x	x	x	x		x
	CUF-BS-BG15-6.5/8.5-20181129	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG16	CUF-BS-BG16-0.0/0.5-20181203	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG16-0.8/2.8-20181203	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG16-5.0/6.8-20181203	Normal Environmental Sample		x	x	x	x	x	x
CUF-BG17	CUF-BS-BG17-0.0/0.5-20181130	Normal Environmental Sample	x	x	x	x	x	x	x
	CUF-BS-BG17-0.75/2.75-20181130	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG17-6.0/8.0-20181130	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG17-11.25/13.25-20181130	Normal Environmental Sample		x	x	x	x	x	x
	CUF-BS-BG17-15.0/16.9-20181130	Normal Environmental Sample		x	x	x	x	x	x

Notes

% Ash	PLM
Total Metals	SW-846 6020A
Total Mercury	SW-846 7471B
Anions	SW-846 9056A
pH (laboratory)	SW-846 9045D
Radium-226, Radium-228, Radium-226+228	EPA 901.1
ID	identification

1. Field and laboratory quality control sample results except for field duplicates are not included in report tables but were used for data validation.
2. Borings CUF-1000ALTA, CUF-1001, CUF-1001ALT, and CUF-1004ALT2A under hydrogeological investigation scope of work; sample collected within well screen interval.
3. Samples collected at CUF-1001 were collected from boring location CUF-1001ALT2.
4. Samples collected at CUF-1001ALT were eliminated from data set due to presence of ash.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-1000ALTA		CUF-1001ALT		CUF-1001ALT2		CUF-1004ALT2A
Sample Date		29-Nov-18	29-Nov-18	12-Dec-18	13-Dec-18	10-Apr-19	10-Apr-19	6-Dec-18
Sample ID		CUF-BS-CUF1000ALTA-13.5/15.0-20181129	CUF-BS-CUF1000ALTA-18.0/19.5-20181129	CUF-BS-CUF-1001ALT-13.5/15.0-20181212	CUF-BS-CUF-1001ALT-19.5/21.0-20181213	CUF-BS-CUF1001-12.0/16.5-20190410	CUF-BS-DUP01-20190410	CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206
Sample Depth		13.5 - 15 ft	18 - 19.5 ft	13.5 - 15 ft	19.5 - 21 ft	12 - 16.5 ft	12 - 16.5 ft	12 - 13.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
PLM								
% ASH	%	-	-	-	-	-	-	-
Total Metals								
Antimony	mg/kg	0.314	0.284	0.291	0.197 J	0.118 J	0.163 J	0.569 J
Arsenic	mg/kg	88.3	33.4	6.34	6.41	3.89	5.15	20.3
Barium	mg/kg	66.6	108	72.4	143	203 J	137 J	59.7
Beryllium	mg/kg	0.718	1.65	0.612	1.46	1.26	1.54	0.914
Boron	mg/kg	11.0	23.8	2.19 J	3.83 J	13.0 J	13.8 J	3.53 U*
Cadmium	mg/kg	0.0910 J	0.0545 J	0.0568 J	0.255	0.241	0.164	0.113 J
Calcium	mg/kg	320,000	125,000	2,100	16,100	60,000 J	9,500 J	517
Chromium	mg/kg	11.7	23.1	17.4	17.7	16.2	19.9	20.7 J
Cobalt	mg/kg	3.88	5.16	11.8	12.1	7.48	9.95	4.15
Copper	mg/kg	6.06	14.0	10.5	20.6	17.0	19.1	24.1
Lead	mg/kg	30.7	16.2	15.0	15.0	12.2	15.1	11.8 J
Lithium	mg/kg	4.76	17.2	7.09	14.5	16.2 J	18.5 J	8.49 J
Mercury	mg/kg	0.0827 J	0.0937 J	<0.0186	0.0774	0.0346 J	0.0322 J	0.0441
Molybdenum	mg/kg	1.41 U*	1.30 U*	0.917	0.543 J	4.53 J	0.739 J	3.10
Nickel	mg/kg	9.76	17.4	12.2	32.6	23.6	28.6	17.4
Selenium	mg/kg	0.566	0.800	0.482 J	0.577 J	1.46 J	1.31 J	0.786
Silver	mg/kg	0.0160 J	0.0201 J	0.0259 J	0.0270 J	<0.0401	<0.0367	0.0577 U*
Thallium	mg/kg	0.733	0.380	0.224	0.352	0.216	0.265	0.384
Vanadium	mg/kg	14.2	26.9	32.7	25.1	19.7	26.6	47.8
Zinc	mg/kg	15.0	37.9	32.5	55.7	71.3	85.5	32.3
Anions								
Chloride	mg/kg	<8.66	<9.43	6.15 J	<4.48	31.7	37.0	<9.75
Fluoride	mg/kg	11.3 J	6.25 J	2.17	3.69	5.25 J	5.07 J	<1.11
Sulfate	mg/kg	10.7 J	8.08 UJ	24.8	50.4	252	228	<8.36
General Chemistry								
pH (lab)	SU	7.8	7.5	7.5	7.8	7.9	7.9	5.8

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-1004ALT2A	CUF-BG01						
Sample Date		6-Dec-18	27-Aug-18	27-Aug-18	27-Aug-18	27-Aug-18	27-Aug-18	27-Aug-18	27-Aug-18
Sample ID		CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206	CUF-BS-BG01-0.0/0.5-20180827	CUF-BS-BG01-0.0/0.5-20180827	CUF-BS-BG01-1.0/3.0-20180827	CUF-BS-BG01-6.5/8.5-20180827	CUF-BS-BG01-11.5/13.5-20180827	CUF-BS-BG01-16.5/18.5-20180827	CUF-BS-BG01-21.5/23.5-20180827
Sample Depth		16.5 - 18 ft	0 - 0.5 ft	0 - 0.5 ft	1 - 3 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Final-Verified	Validated	Validated	Validated	Validated	Validated	Validated
PLM									
% ASH	%	-	<1	-	-	-	-	-	-
Total Metals									
Antimony	mg/kg	0.639 J	-	0.816 J	1.86 J	6.19 J	1.36 J	2.53 J	1.52 J
Arsenic	mg/kg	16.4	-	16.3	58.6	77.2	12.5	39.9	22.3
Barium	mg/kg	67.7	-	85.4	37.9	36.0	42.7	271	40.2
Beryllium	mg/kg	1.67	-	0.708	0.703	0.560	0.462	1.15	0.851
Boron	mg/kg	3.04 U*	-	1.72 J	4.32 J	6.24 J	7.16 J	3.90 J	5.75 J
Cadmium	mg/kg	0.112 J	-	0.218	0.141	0.204	0.171	0.217	0.345
Calcium	mg/kg	587	-	1,880 J	1,030	312	265	415	395
Chromium	mg/kg	17.8 J	-	31.1 J	30.6	15.4	11.7	17.0	12.7
Cobalt	mg/kg	12.0	-	10.8 J	2.10	0.548	0.621	1.84	6.06
Copper	mg/kg	20.0	-	17.3 J	54.1	117	92.0	189	139
Lead	mg/kg	13.8 J	-	15.5	13.0	43.3	11.2	41.5	18.9
Lithium	mg/kg	8.86 J	-	2.89 J	3.63 J	1.98 J	2.07 J	3.03 J	2.89 J
Mercury	mg/kg	0.213	-	0.0634 J	0.0927 J	0.213	0.0764 J	0.0989 J	0.163
Molybdenum	mg/kg	2.24	-	10.2	66.1	172	17.9	54.0	28.4
Nickel	mg/kg	17.4	-	14.0 J	12.0	3.07	4.50	12.0	33.3
Selenium	mg/kg	1.73	-	0.449 J	1.02 J	1.27 J	0.492 J	1.31 J	0.842 J
Silver	mg/kg	0.0726 U*	-	0.139	0.0531 J	0.0694 J	0.0714 J	0.148	0.0852 J
Thallium	mg/kg	0.395	-	0.258	0.577	0.468	0.748	1.38	1.98
Vanadium	mg/kg	38.2	-	40.7 J	60.6 J	80.2 J	35.6 J	119 J	60.8 J
Zinc	mg/kg	35.6	-	43.8 J	24.7	11.1	9.66	23.8	45.4
Anions									
Chloride	mg/kg	<9.51	-	<8.60	<8.18	<8.56	<8.89	<8.93	<9.31
Fluoride	mg/kg	<1.09	-	1.65	<0.935	<0.979	<1.02	<1.02	<1.06
Sulfate	mg/kg	<8.15	-	12.6 U*	18.8 U*	9.39 U*	9.26 U*	7.77 U*	107
General Chemistry									
pH (lab)	SU	5.5	-	6.2	6.0	5.1	5.0	5.2	4.6

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG02				CUF-BG03			
Sample Date		22-Aug-18	22-Aug-18	22-Aug-18	22-Aug-18	22-Aug-18	22-Aug-18	22-Aug-18	22-Aug-18
Sample ID		CUF-BS-BG02-0/0.5-20180822	CUF-BS-BG02-0/0.5-20180822	CUF-BS-BG02-1.5/3.5-20180822	CUF-BS-BG02-5.0/7.6-20180822	CUF-BS-BG03-0/0.5-20180822	CUF-BS-BG03-0/0.5-20180822	CUF-BS-BG03-1.2/3.2-20180822	CUF-BS-BG03-5.2/7.2-20180822
Sample Depth		0 - 0.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	5 - 7.6 ft	0 - 0.5 ft	0 - 0.5 ft	1.2 - 3.2 ft	5.2 - 7.2 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Validated	Validated	Validated	Final-Verified	Validated	Validated	Validated
PLM									
% ASH	%	1	-	-	-	1	-	-	-
Total Metals									
Antimony	mg/kg	-	0.314 J	0.652 J	0.303 J	-	0.254 J	0.492 J	0.714 J
Arsenic	mg/kg	-	4.27	7.37	3.67	-	6.34	15.0	88.7
Barium	mg/kg	-	60.7	74.8	50.0	-	58.0	90.2	133
Beryllium	mg/kg	-	0.663	0.616	0.781	-	0.440	0.724	1.27
Boron	mg/kg	-	1.50 J	2.13 J	7.00 J	-	2.04 J	2.28 J	2.38 J
Cadmium	mg/kg	-	0.108 J	0.0547 J	0.0672 J	-	0.0891 J	0.107 J	0.285
Calcium	mg/kg	-	1,050	1,570	131,000	-	1,320	674	3,980
Chromium	mg/kg	-	14.5	21.6	16.0	-	12.6	19.0	25.1
Cobalt	mg/kg	-	7.48	11.7	6.19	-	7.91	15.3	14.2
Copper	mg/kg	-	5.51	12.0	11.2	-	12.1	22.1	77.2
Lead	mg/kg	-	12.4	18.0	6.95	-	14.6	24.8	41.9
Lithium	mg/kg	-	3.93 J	8.55 J	11.1 J	-	5.15 J	9.26 J	14.3 J
Mercury	mg/kg	-	<0.0361	0.0525 J	0.0408 J	-	<0.0370	0.0469 J	<0.0368
Molybdenum	mg/kg	-	0.660	1.59	1.09	-	0.846	2.32	4.43
Nickel	mg/kg	-	6.84	12.9	18.7	-	8.02	18.3	44.8
Selenium	mg/kg	-	0.588 J	0.468 J	0.344 J	-	0.647 J	0.622 J	1.08 J
Silver	mg/kg	-	0.0285 J	0.0249 J	0.0353 J	-	0.0275 J	0.0262 J	0.0624 J
Thallium	mg/kg	-	0.142	0.261	0.195	-	0.131	0.232	0.271
Vanadium	mg/kg	-	19.1	33.8	16.5	-	22.5	34.7	44.5
Zinc	mg/kg	-	20.8	30.2	29.2	-	27.0	30.8	51.6
Anions									
Chloride	mg/kg	-	10.0 U*	<8.26	<8.51	-	10.8 U*	<8.01	<8.84
Fluoride	mg/kg	-	1.19 J	<0.944	1.39	-	2.31	<0.915	2.66
Sulfate	mg/kg	-	22.1 U*	51.8	7.95 U*	-	17.0 U*	81.5	31.5
General Chemistry									
pH (lab)	SU	-	5.5	6.2	8.3	-	5.9	5.7	7.6

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG04					CUF-BG05			
Sample Date		23-Aug-18	23-Aug-18	23-Aug-18	23-Aug-18	23-Aug-18	29-Nov-18	29-Nov-18	29-Nov-18	29-Nov-18
Sample ID		CUF-BS-BG04-0.0/0.5-20180823	CUF-BS-BG04-0.0/0.5-20180823	CUF-BS-BG04-1.5/3.5-20180823	CUF-BS-BG04-6.5/8.5-20180823	CUF-BS-BG04-10.0/11.4-20180823	CUF-BS-BG05-0.0/0.5-20181129	CUF-BS-BG05-2.5/4.5-20181129	CUF-BS-BG05-6.5/8.5-20181129	CUF-BS-BG05-11.5/13.5-20181129
Sample Depth		0 - 0.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	10 - 11.4 ft	0 - 0.5 ft	2.5 - 4.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Validated	Validated	Validated	Validated	Final-Verified	Final-Verified	Final-Verified	Final-Verified
PLM										
% ASH	%	<1	-	-	-	-	3	-	-	-
Total Metals										
Antimony	mg/kg	-	0.261 J	0.337 J	0.653 J	0.227 J	0.307 U*	0.241 U*	0.333 U*	0.304 U*
Arsenic	mg/kg	-	4.81	13.7 J	22.8 J	7.97 J	5.37 J	5.10 J	7.48 J	8.63 J
Barium	mg/kg	-	108	342	214	56.6	124	119	65.6	80.1
Beryllium	mg/kg	-	0.841	1.83	1.93	1.52	1.02	1.30	0.874	1.49
Boron	mg/kg	-	1.42 J	2.01 J	1.16 J	<0.998	2.28 J	1.82 J	3.02 J	3.12 J
Cadmium	mg/kg	-	0.125	0.350	0.914 J	0.211 J	0.146	0.0526 J	0.0457 J	0.101 J
Calcium	mg/kg	-	1,250	1,940	1,700	1,970	1,290 J	723 J	833 J	1,070 J
Chromium	mg/kg	-	22.1	20.1	39.7	20.9	12.1	11.5	15.1	20.1
Cobalt	mg/kg	-	11.3	15.9	25.0	5.48	19.2	13.2	10.6	11.8
Copper	mg/kg	-	7.38	10.8	18.5	13.9	10.7	12.4	16.8	19.5
Lead	mg/kg	-	17.4	20.8	44.8 J	15.3 J	20.0	14.8	9.58	12.1
Lithium	mg/kg	-	3.95 J	8.28 J	12.1 J	13.2 J	4.35 J	7.21 J	7.83 J	10.8 J
Mercury	mg/kg	-	<0.0347	0.0537 J	0.0663 J	0.0537 J	<0.0395	<0.0364	0.0426 J	0.0519 J
Molybdenum	mg/kg	-	0.694	0.951 J	3.20 J	0.504 J	1.01	1.91	1.53	1.23
Nickel	mg/kg	-	8.53	17.6	28.3	16.9	11.1	14.4	16.3	22.7
Selenium	mg/kg	-	0.672 J	1.25 J	0.626 J	0.895 J	0.956 J	0.844 J	0.364 J	0.760 J
Silver	mg/kg	-	0.0397 J	0.0743 J	0.0337 J	0.0957 J	0.0411 J	0.0338 J	0.0206 J	0.0293 J
Thallium	mg/kg	-	0.152	0.232	0.314 J	0.245 J	0.170	0.442	0.262	0.268
Vanadium	mg/kg	-	20.6	41.4	62.2	26.9	22.1 J	26.3 J	30.9 J	33.2 J
Zinc	mg/kg	-	22.2	43.5	66.4	58.7	24.9	37.5	30.0	47.1
Anions										
Chloride	mg/kg	-	22.5	<8.64	<8.67	<9.20	<9.27	<8.67	<8.80	<9.41
Fluoride	mg/kg	-	7.84 J	0.988 J	1.31 J	2.38 J	2.19 J	0.991 UR	1.01 UR	1.08 UR
Sulfate	mg/kg	-	9.87 U*	10.7 U*	13.7 U*	10.2 U*	11.1 J	24.7 J	23.5 J	12.7 J
General Chemistry										
pH (lab)	SU	-	7.3	7.0	6.9	7.3	5.9	6.0	5.5	5.5

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG06			CUF-BG07					
Sample Date		4-Dec-18	4-Dec-18	4-Dec-18	21-Aug-18	21-Aug-18	21-Aug-18	21-Aug-18	21-Aug-18	21-Aug-18
Sample ID		CUF-BS-BG06-0.0/0.5-20181204	CUF-BS-BG06-0.5/2.5-20181204	CUF-BS-BG06-6.8/8.8-20181204	CUF-BS-BG07-0/0.66-20180821	CUF-BS-BG07-0/0.66-20180821	CUF-BS-BG07-1.5/3.5-20180821	CUF-BS-BG07-6.1/8.1-20180821	CUF-BS-BG07-11.6/13.6-20180821	CUF-BS-BG07-15.5/17.5-20180821
Sample Depth		0 - 0.5 ft	0.5 - 2.5 ft	6.8 - 8.8 ft	0 - 0.66 ft	0 - 0.66 ft	1.5 - 3.5 ft	6.1 - 8.1 ft	11.6 - 13.6 ft	15.5 - 17.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Validated	Validated	Validated	Validated	Validated
PLM										
% ASH	%	<1	-	-	<1	-	-	-	-	-
Total Metals										
Antimony	mg/kg	0.670 J	0.628 J	0.847 J	-	0.218 J	0.208 J	0.194 J	0.284 J	0.238 J
Arsenic	mg/kg	15.5	35.7	35.3	-	4.93	4.04	5.74	9.86	7.94
Barium	mg/kg	145	121	103	-	56.4	26.3	58.1	73.6	88.0
Beryllium	mg/kg	2.13 J	1.93 J	1.78 J	-	0.554	0.298	0.611	1.37	2.82
Boron	mg/kg	7.18 J	7.22 J	4.51 J	-	1.72 J	1.16 J	1.42 J	1.57 J	1.89 J
Cadmium	mg/kg	0.402	1.07	0.827	-	0.0825 J	0.0277 J	0.0392 J	0.0717 J	0.0854 J
Calcium	mg/kg	4,650	7,290	5,960	-	846	225	854	2,190	3,870
Chromium	mg/kg	28.2	30.3	35.7	-	14.8	11.6	16.7	21.5	18.4
Cobalt	mg/kg	20.4	15.1	23.0	-	7.05	5.44	2.03	3.28	18.7
Copper	mg/kg	16.3	20.3	26.0	-	12.2	6.42	10.5	16.1	15.7
Lead	mg/kg	30.3	125	125	-	12.7	7.58	10.2	15.6	12.7
Lithium	mg/kg	13.4 J	17.3 J	14.1 J	-	5.22 J	3.62 J	4.66 J	6.43 J	11.7 J
Mercury	mg/kg	0.0641	0.0811	0.0511	-	<0.0374	0.0393 J	<0.0334	0.0564 J	0.0578 J
Molybdenum	mg/kg	1.42	1.32	2.35	-	0.740 U*	1.57 U*	1.24 U*	1.31 U*	0.924 U*
Nickel	mg/kg	35.9	41.8	39.6	-	8.28	7.09	9.76	16.7	22.1
Selenium	mg/kg	0.398 J	0.537 J	0.407 J	-	0.549 J	0.241 J	0.306 J	0.507 J	0.799 J
Silver	mg/kg	0.0362 J	0.0582 J	0.0534 J	-	0.0239 J	<0.0167	<0.0160	0.0192 J	<0.0181
Thallium	mg/kg	0.286	0.432	0.321	-	0.138	0.162	0.224	0.319	0.313
Vanadium	mg/kg	43.0	44.5	47.6	-	23.1	17.5	24.2	38.0	30.5
Zinc	mg/kg	92.0	195	187	-	30.5	34.4	25.6	45.0	48.7
Anions										
Chloride	mg/kg	<9.72	<9.05	<9.47	-	<8.97	<8.03	8.74 U*	<9.54	<9.39
Fluoride	mg/kg	2.03 U*	2.69	2.19 U*	-	1.22 U*	0.917 UR	0.900 UR	1.09 UR	1.73 U*
Sulfate	mg/kg	<8.33	<7.76	12.9 U*	-	14.4 U*	46.3 J	6.75 UJ	13.3 U*	9.04 U*
General Chemistry										
pH (lab)	SU	6.3	7.6	7.7	-	5.2	4.7	4.8	5.1	6.9

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG08						CUF-BG09			
Sample Date		24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	23-Aug-18	23-Aug-18	23-Aug-18	23-Aug-18
Sample ID		CUF-BS-BG08-0.0/0.5-20180824	CUF-BS-BG08-0.0/0.5-20180824	CUF-BS-BG08-0.9/2.9-20180824	CUF-BS-FD01-20180824	CUF-BS-BG08-6.5/8.5-20180824	CUF-BS-BG08-10.0/12.0-20180824	CUF-BS-BG09-0.0/0.5-20180823	CUF-BS-BG09-0.0/0.5-20180823	CUF-BS-BG09-1.5/3.5-20180823	CUF-BS-BG09-6.5/8.5-20180823
Sample Depth		0 - 0.5 ft	0 - 0.5 ft	0.9 - 2.9 ft	0.9 - 2.9 ft	6.5 - 8.5 ft	10 - 12 ft	0 - 0.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Final-Verified	Validated	Validated	Validated	Validated	Validated	Final-Verified	Validated	Validated	Validated
	Units										
PLM											
% ASH	%	1	-	-	-	-	-	1	-	-	-
Total Metals											
Antimony	mg/kg	-	0.247 J	0.183 J	0.225 J	0.358 J	0.258 J	-	0.228 J	0.332 J	0.782 J
Arsenic	mg/kg	-	5.75	5.22	5.69	13.5	11.4	-	4.78 J	7.59 J	22.8 J
Barium	mg/kg	-	75.9	100	107	191	144	-	73.8	52.7	33.9
Beryllium	mg/kg	-	0.680	0.789	0.847	1.17	1.03	-	0.670	0.418	1.04
Boron	mg/kg	-	2.13 J	2.40 J	2.50 J	2.85 J	3.13 J	-	1.19 J	1.42 J	2.07 J
Cadmium	mg/kg	-	0.199	0.201	0.256	0.952	1.01	-	0.0658 J	0.0371 J	0.0354 J
Calcium	mg/kg	-	2,610	1,740	2,090 J	2,270	3,000	-	999	836 J	446
Chromium	mg/kg	-	18.9	17.7	20.2 J	25.5	26.6	-	11.8	19.8 J	17.5
Cobalt	mg/kg	-	9.91	9.93	10.5 J	23.0	16.1	-	9.09	10.3 J	4.78
Copper	mg/kg	-	8.71	9.61	10.3 J	15.7	23.4	-	5.90	9.18 J	15.0
Lead	mg/kg	-	16.5	12.2	14.4	20.4	17.5	-	13.4 J	12.9 J	18.2 J
Lithium	mg/kg	-	4.74 J	7.56 J	9.07 J	26.9 J	31.0 J	-	4.44 J	7.02 J	8.89 J
Mercury	mg/kg	-	<0.0363	<0.0359	<0.0373	<0.0349	0.0391 J	-	<0.0357	0.0638 J	0.0925 J
Molybdenum	mg/kg	-	0.499 J	0.561 J	0.592 J	1.08	1.13	-	0.612 J	1.29 J	3.65 J
Nickel	mg/kg	-	11.5	11.8	13.5 J	26.8	34.3	-	8.37	9.53 J	17.9
Selenium	mg/kg	-	0.348 J	0.367 J	0.439 J	0.281 J	0.251 J	-	0.717 J	0.318 J	0.261 J
Silver	mg/kg	-	0.0417 J	0.0521 J	0.0633 J	0.0806 J	0.0996 J	-	0.0252 J	0.0289 J	0.0388 J
Thallium	mg/kg	-	0.132	0.159	0.156	0.238	0.294	-	0.136 J	0.171 J	0.364 J
Vanadium	mg/kg	-	30.3 J	30.8 J	34.0 J	55.2 J	41.4 J	-	19.7	29.5 J	34.6
Zinc	mg/kg	-	32.4	32.2	36.6 J	72.1	87.2	-	20.5	22.8 J	27.5
Anions											
Chloride	mg/kg	-	17.6 U*	<8.69	<8.58	<8.35	<8.99	-	<8.27	<7.97	<9.58
Fluoride	mg/kg	-	1.93	2.40	2.20	2.30	2.55	-	2.74 J	0.911 UR	1.10 UR
Sulfate	mg/kg	-	27.9 U*	11.1 U*	12.9 U*	12.5 U*	15.3 U*	-	8.68 U*	16.6 U*	<8.21
General Chemistry											
pH (lab)	SU	-	7.4	7.7	7.6	7.6	7.6	-	6.7	6.0	5.6

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG09		CUF-BG10				CUF-BG11		
Sample Date		23-Aug-18	23-Aug-18	5-Dec-18	5-Dec-18	5-Dec-18	5-Dec-18	6-Dec-18	6-Dec-18	6-Dec-18
Sample ID		CUF-BS-BG09-11.5/13.5-20180823	CUF-BS-BG09-16.5/18.5-20180823	CUF-BS-BG10-0.0/0.5-20181205	CUF-BS-DUP02-20181205	CUF-BS-BG10-1.0/3.0-20181205	CUF-BS-BG10-5.6/7.6-20181205	CUF-BS-BG11-0.0/0.5-20181206	CUF-BS-BG11-1.0/3.0-20181206	CUF-BS-BG11-6.5/8.5-20181206
Sample Depth		11.5 - 13.5 ft	16.5 - 18.5 ft	0 - 0.5 ft	0 - 0.5 ft	1 - 3 ft	5.6 - 7.6 ft	0 - 0.5 ft	1 - 3 ft	6.5 - 8.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Validated	Validated	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
PLM										
% ASH	%	-	-	<1	1	-	-	<1	-	-
Total Metals										
Antimony	mg/kg	0.819 J	0.707 J	0.590 J	0.576 J	0.397 J	0.486 J	0.346 J	0.626 J	0.787 J
Arsenic	mg/kg	17.8 J	19.9 J	15.4	15.4	12.3	20.4	5.83	8.52	12.5
Barium	mg/kg	45.9	58.5	72.0	65.8	92.5	82.4	70.7	37.5	37.6
Beryllium	mg/kg	0.888	5.59	0.728	0.666	0.498	1.09	0.575	0.426	0.757
Boron	mg/kg	1.78 J	1.59 J	3.74 J	3.47 J	2.34 J	1.83 J	3.74 U*	6.02 U*	4.55 U*
Cadmium	mg/kg	0.0416 J	0.0786 J	0.226	0.161	0.216	0.229	0.135 J	0.110 J	0.296
Calcium	mg/kg	552	1,370	7,730	10,400	1,690	1,770	1,430	932	1,380
Chromium	mg/kg	26.9	35.4	26.6	37.6	20.8	26.5	34.3 J	23.0 J	25.6 J
Cobalt	mg/kg	3.75	6.99	14.2	13.8	13.8	18.2	6.93	1.69	6.11
Copper	mg/kg	15.4	19.3	15.3	14.7	16.9	12.8	6.48	12.8	22.8
Lead	mg/kg	19.3 J	27.1 J	21.6	21.4	15.3	18.1	12.1 J	7.50 J	9.17 J
Lithium	mg/kg	10.2 J	14.4 J	6.67 J	6.17 J	9.59 J	6.10 J	4.26 J	5.47 J	5.97 J
Mercury	mg/kg	0.114 J	0.131 J	0.0342 J	0.0376 J	0.0453	0.0266 J	0.0251 J	0.0881	0.105
Molybdenum	mg/kg	3.62 J	2.97 J	3.20	2.41	1.87	2.27	0.893	2.02	2.12
Nickel	mg/kg	18.7	19.5	18.3	18.9	17.2	19.3	9.73	16.8	24.8
Selenium	mg/kg	0.358 J	2.41 J	0.632 J	0.492 J	0.374 J	0.337 J	0.903	0.652	1.07
Silver	mg/kg	0.0348 J	0.0671 J	0.0404 J	0.0389 J	0.0380 J	0.0382 J	0.0594 U*	0.363	0.136
Thallium	mg/kg	0.361 J	0.466 J	0.237	0.218	0.249	0.248	0.145	0.193	0.286
Vanadium	mg/kg	49.5	61.0	40.8 J	45.9 J	44.2 J	49.1 J	30.3	47.6	60.9
Zinc	mg/kg	27.3	49.6	50.0	56.5	45.6	40.4	32.7	73.0	157
Anions										
Chloride	mg/kg	<9.51	<10.1	<9.22	<9.09	<8.73	<8.69	<9.28	<9.17	<9.46
Fluoride	mg/kg	1.09 UR	1.16 UR	3.08 J	3.06 J	0.998 UJ	0.993 UJ	1.68 J	1.05 UR	1.08 UR
Sulfate	mg/kg	11.5 U*	<8.68	10.6 U*	10.1 U*	51.3 J	34.9 J	7.96 UJ	17.7 J	12.0 J
General Chemistry										
pH (lab)	SU	5.9	6.8	8.2	8.1	6.4	5.9	6.5	5.9	5.8

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG11	CUF-BG12				CUF-BG13				
Sample Date		6-Dec-18	6-Dec-18	6-Dec-18	6-Dec-18	6-Dec-18	28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18
Sample ID		CUF-BS-BG11-11.2/13.2-20181206	CUF-BS-BG12-0.0/0.5-20181206	CUF-BS-BG12-2.5/4.5-20181206	CUF-BS-BG12-6.5/8.5-20181206	CUF-BS-BG12-10.6/12.6-20181206	CUF-BS-BG13-0.0/0.5-20180828	CUF-BS-FD02-20180828	CUF-BS-BG13-0.0/0.5-20180828	CUF-BS-FD02-20180828	CUF-BS-BG13-0.75/2.75-20180828
Sample Depth		11.2 - 13.2 ft	0 - 0.5 ft	2.5 - 4.5 ft	6.5 - 8.5 ft	10.6 - 12.6 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0.75 - 2.75 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Validated	Validated	Validated
PLM											
% ASH	%	-	<1	-	-	-	<1	<1	-	-	-
Total Metals											
Antimony	mg/kg	0.707 J	0.436 J	0.230 J	0.324 J	0.299 J	-	-	0.529 J	0.637 J	0.738 J
Arsenic	mg/kg	9.06	7.40	3.92	5.92	6.53	-	-	8.96	10.4	10.3
Barium	mg/kg	29.5	84.2	135	67.2	75.3	-	-	87.2 J	130 J	146
Beryllium	mg/kg	0.608	0.484	0.806	0.294	0.347	-	-	1.33 J	2.02 J	1.94
Boron	mg/kg	3.23 U*	5.47 U*	2.77 U*	2.74 U*	2.17 U*	-	-	6.25 J	5.62 J	5.55 J
Cadmium	mg/kg	0.356	0.119 J	0.0629 J	0.0650 J	0.0716 J	-	-	0.387	0.325	0.549
Calcium	mg/kg	1,030	1,710	446	424	444	-	-	6,780	7,020	5,770
Chromium	mg/kg	18.8 J	19.2 J	16.2 J	20.0 J	17.0 J	-	-	23.2	20.3	31.6
Cobalt	mg/kg	22.9	6.23	8.84	4.26	4.06	-	-	22.3	28.9	13.4
Copper	mg/kg	15.6	10.8	7.30	7.43	8.88	-	-	16.1	16.7	18.3
Lead	mg/kg	7.68 J	11.6 J	9.53 J	8.79 J	9.60 J	-	-	26.7	30.5	23.2
Lithium	mg/kg	4.63 J	4.24 J	4.61 J	6.85 J	6.79 J	-	-	7.71 J	10.2 J	17.0 J
Mercury	mg/kg	0.0617	0.0399 J	0.0198 J	0.0525	0.0487	-	-	0.0526 J	0.0481 J	0.0502 J
Molybdenum	mg/kg	2.39	1.67	0.744	1.64	1.82	-	-	1.18 J	2.89 J	1.21
Nickel	mg/kg	20.8	10.2	10.7	12.9	13.1	-	-	37.7	37.2	42.8
Selenium	mg/kg	0.973	0.928	1.32	0.653	0.688	-	-	0.462 J	1.28 J	0.630 J
Silver	mg/kg	0.0871 U*	0.0395 U*	0.0490 U*	0.0586 U*	0.0549 U*	-	-	0.0281 J	0.0412 J	0.0374 J
Thallium	mg/kg	0.310	0.164	0.169	0.221	0.212	-	-	0.245	0.452	0.324
Vanadium	mg/kg	41.9	32.1	22.6	33.2	33.2	-	-	40.2 J	36.1 J	52.3 J
Zinc	mg/kg	115	32.4	24.3	30.6	32.5	-	-	53.7	53.7	75.1
Anions											
Chloride	mg/kg	<9.06	<9.40	<8.35	<8.64	<8.60	-	-	<8.62	<8.73	<9.46
Fluoride	mg/kg	1.04 UR	1.49 J	0.954 UR	0.987 UR	0.983 UR	-	-	3.02	3.43	3.80
Sulfate	mg/kg	8.05 U*	8.08 U*	37.8 J	33.5 J	19.9 J	-	-	8.77 U*	7.56 U*	<8.10
General Chemistry											
pH (lab)	SU	5.9	6.7	5.5	5.3	5.5	-	-	7.0	7.3	7.7

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG13	CUF-BG14					CUF-BG15		
Sample Date		28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18	29-Nov-18	29-Nov-18	29-Nov-18
Sample ID		CUF-BS-BG13-6.5/8.5-20180828	CUF-BS-BG14-0.0/0.5-20180828	CUF-BS-BG14-0.0/0.5-20180828	CUF-BS-BG14-1.0/3.0-20180828	CUF-BS-BG14-6.5/8.5-20180828	CUF-BS-BG14-10.3/12.3-20180828	CUF-BS-BG15-0.0/0.5-20181129	CUF-BS-BG15-1.9/3.9-20181129	CUF-BS-DUP01-20181129
Sample Depth		6.5 - 8.5 ft	0 - 0.5 ft	0 - 0.5 ft	1 - 3 ft	6.5 - 8.5 ft	10.3 - 12.3 ft	0 - 0.5 ft	1.9 - 3.9 ft	1.9 - 3.9 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample
Level of Review		Validated	Final-Verified	Validated	Validated	Validated	Validated	Final-Verified	Final-Verified	Final-Verified
	Units									
PLM										
% ASH	%	-	<1	-	-	-	-	1	-	-
Total Metals										
Antimony	mg/kg	0.643 J	-	0.700 J	1.32 J	0.979 J	0.695 J	0.259 U*	0.357 U*	0.310 U*
Arsenic	mg/kg	4.88	-	16.5	24.6	17.4	15.5	5.50 J	7.42 J	7.32 J
Barium	mg/kg	101	-	121	138	151	104	78.6	60.2	58.1
Beryllium	mg/kg	1.31	-	1.29	1.82	1.55	1.45	0.808	0.438	0.474
Boron	mg/kg	8.74 J	-	4.10 J	2.64 J	2.41 J	3.21 J	1.64 J	1.60 J	1.76 J
Cadmium	mg/kg	0.298	-	0.245	0.307	0.647	0.285	0.0958 J	0.0409 J	0.0446 J
Calcium	mg/kg	5,830	-	4,660	3,730	2,680	7,580	969 J	578 J	609 J
Chromium	mg/kg	23.8	-	34.3	38.4	39.1	34.0	15.6	16.9	22.0
Cobalt	mg/kg	13.3	-	18.1	17.5	26.3	21.8	11.7	15.6	16.1
Copper	mg/kg	12.7	-	15.3	16.3	19.2	15.7	7.41	11.1	14.1
Lead	mg/kg	16.3	-	19.5	27.8	45.5	26.1	14.5	19.2	17.1
Lithium	mg/kg	13.9 J	-	8.07 J	6.68 J	6.45 J	7.79 J	4.63 J	7.80 J	8.17 J
Mercury	mg/kg	<0.0391	-	0.0425 J	0.0716 J	0.0521 J	0.0597 J	<0.0374	0.0647 J	0.0547 J
Molybdenum	mg/kg	0.609 J	-	4.70	25.3	26.2	3.53	1.04	1.88	1.24
Nickel	mg/kg	37.8	-	27.5	28.9	27.1	26.2	9.29	9.47	10.4
Selenium	mg/kg	0.277 J	-	0.581 J	0.972 J	0.678 J	0.515 J	0.733 J	0.414 J	0.398 J
Silver	mg/kg	0.0217 J	-	0.0349 J	0.0379 J	0.0233 J	0.0337 J	0.0259 J	<0.0185	0.0197 J
Thallium	mg/kg	0.238	-	0.245	0.323	0.321	0.252	0.158	0.304	0.170
Vanadium	mg/kg	34.8 J	-	49.3 J	50.4 J	52.4 J	48.7 J	23.5 J	30.8 J	34.0 J
Zinc	mg/kg	61.1	-	50.4	51.0	53.7	54.1	25.8	29.0	30.6
Anions										
Chloride	mg/kg	<9.02	-	<8.61	<9.01	<8.49	<8.64	<9.17	<8.70	<8.74
Fluoride	mg/kg	2.45	-	3.10	2.75	2.50	3.34	1.86 J	0.994 UR	0.998 UR
Sulfate	mg/kg	<7.73	-	20.3 U*	19.6 U*	8.39 U*	<7.40	11.6 J	29.0 J	30.6 J
General Chemistry										
pH (lab)	SU	7.9	-	7.2	7.3	7.1	7.9	5.7	5.1	4.9

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG15	CUF-BG16			CUF-BG17					
Sample Date		29-Nov-18	3-Dec-18	3-Dec-18	3-Dec-18	30-Nov-18	30-Nov-18	30-Nov-18	30-Nov-18	30-Nov-18
Sample ID		CUF-BS-BG15-6.5/8.5-20181129	CUF-BS-BG16-0.0/0.5-20181203	CUF-BS-BG16-0.8/2.8-20181203	CUF-BS-BG16-5.0/6.8-20181203	CUF-BS-BG17-0.0/0.5-20181130	CUF-BS-BG17-0.75/2.75-20181130	CUF-BS-BG17-6.0/8.0-20181130	CUF-BS-BG17-11.25/13.25-20181130	CUF-BS-BG17-15.0/16.9-20181130
Sample Depth		6.5 - 8.5 ft	0 - 0.5 ft	0.8 - 2.8 ft	5 - 6.8 ft	0 - 0.5 ft	0.75 - 2.75 ft	6 - 8 ft	11.25 - 13.25 ft	15 - 16.9 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
PLM										
% ASH	%	-	<1	-	-	<1	-	-	-	-
Total Metals										
Antimony	mg/kg	0.335 U*	1.34 J	0.911 J	0.674 J	0.319 U*	0.262 U*	0.326 U*	0.378 U*	0.451 U*
Arsenic	mg/kg	8.00 J	53.8	79.4	70.7	5.83 J	4.95 J	13.3 J	17.9 J	30.4 J
Barium	mg/kg	264	227	570	127	101	107	637	91.3	81.1
Beryllium	mg/kg	1.89	2.05 J	2.15 J	2.57 J	0.741	1.18	1.01	1.67	1.53
Boron	mg/kg	2.26 J	4.97 J	4.78 J	3.45 J	2.29 J	2.71 J	1.55 J	1.93 J	2.24 J
Cadmium	mg/kg	0.148 J	0.347	0.361	0.218	0.178	0.116 J	0.423	0.352	0.309
Calcium	mg/kg	5,360 J	3,200	3,220	1,240	2,870 J	3,780 J	3,240 J	4,760 J	4,200 J
Chromium	mg/kg	23.8	30.6	33.4	38.6	12.8	18.1	14.7	20.7	25.5
Cobalt	mg/kg	13.6	45.0	27.6	77.6	9.04	7.25	33.0	12.7	30.7
Copper	mg/kg	18.8	64.3	112	83.0	11.4	13.8	10.4	19.0	16.4
Lead	mg/kg	21.6	20.0	21.4	10.5	14.7	15.4	11.6	17.8	18.2
Lithium	mg/kg	12.2 J	7.17 J	5.54 J	3.64 J	4.88 J	7.67 J	5.89 J	9.30 J	9.04 J
Mercury	mg/kg	0.117 J	0.0856	0.0859	0.0359 J	0.0521 J	0.0397 J	0.0396 J	0.0630 J	0.0579 J
Molybdenum	mg/kg	0.887	34.5	24.6	17.7	1.47	1.47	2.51	1.61	3.57
Nickel	mg/kg	25.5	218	272	398	12.2	13.6	20.8	23.7	31.8
Selenium	mg/kg	0.837 J	2.01	2.91	0.759	0.755 J	1.15 J	0.682 J	0.868 J	0.893 J
Silver	mg/kg	0.0288 J	0.0585 J	0.0333 J	0.0260 J	0.0422 J	0.0695 J	0.0558 J	0.0694 J	0.0520 J
Thallium	mg/kg	0.220	1.77	1.49	1.21	0.196	0.204	0.200	0.194	0.556
Vanadium	mg/kg	30.5 J	74.5	76.4	67.9	23.3 J	24.0 J	25.4 J	43.2 J	35.5 J
Zinc	mg/kg	38.3	352	256	692	33.8	35.7	37.6	66.2	54.1
Anions										
Chloride	mg/kg	<9.32	<9.16	<10.3	<10.7	<10.0	<9.42	<8.59	<9.21	<9.10
Fluoride	mg/kg	4.03 J	<1.05	<1.18	<1.23	2.48 U*	2.81 U*	2.03 U*	2.91 U*	2.52 U*
Sulfate	mg/kg	7.99 UJ	36.5	33.2	14.4 U*	28.5 J	8.65 U*	7.37 UJ	7.90 UJ	7.80 UJ
General Chemistry										
pH (lab)	SU	7.5	6.5	6.0	5.8	6.2	6.9	7.0	7.6	7.6

Notes:

<0.03	analyte was not detected at a concentration greater than the Method Detection Limit
-	parameter not analyzed / not available
%	percent
ft	feet below ground surface
ID	identification
J	quantitation is approximate due to limitations identified during data validation
mg/kg	milligrams per kilogram
PLM	Polarized Light Microscope - analysis for % ash
SU	Standard Unit
U*	this result should be considered “not detected” because it was detected in an associated field or laboratory blank at a similar level
UJ	this compound was not detected, but the reporting or detection limit should be considered estimated due to a bias identified during data validation
UR	Unreliable reporting or detection limit; compound may or may not be present in sample.

1. Level of review is defined in the Quality Assurance Project Plan.
2. Non-detect (ND) results reported by RJ Lee Group for percent (%) ash expressed as <1 in table.
3. The 0-0.5 foot sample was collected using a hand auger when accessible during the drilling operations at that boring location; it may or may not have been the first sample obtained and thus could have a different sample date.
4. Level of review for % ash samples is Final-Verified.
5. Samples collected at CUF-1001 were collected from boring location CUF-1001ALT2.
6. Samples collected at CUF-1001ALT were eliminated from data set due to presence of ash.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-1000ALTA		CUF-1001ALT		CUF-1001ALT2		CUF-1004ALT2A
Sample Date		29-Nov-18	29-Nov-18	12-Dec-18	13-Dec-18	10-Apr-19	10-Apr-19	6-Dec-18
Sample ID		CUF-BS-CUF1000ALTA-13.5/15.0-20181129	CUF-BS-CUF1000ALTA-18.0/19.5-20181129	CUF-BS-CUF-1001ALT-13.5/15.0-20181212	CUF-BS-CUF-1001ALT-19.5/21.0-20181213	CUF-BS-CUF1001-12.0/16.5-20190410	CUF-BS-DUP01-20190410	CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206
Sample Depth		13.5 - 15 ft	18 - 19.5 ft	13.5 - 15 ft	19.5 - 21 ft	12 - 16.5 ft	12 - 16.5 ft	12 - 13.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample
Level of Review		Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
	Units							
Radiological Parameters								
Radium-226	pCi/g	4.31 +/-(0.607)	2.14 +/-(0.406)	1.08 +/-(0.241)	0.670 +/-(0.237)	1.34 +/-(0.227)J	0.929 +/-(0.270)J	1.17 +/-(0.311)
Radium-228	pCi/g	0.181 +/-(0.324)U	0.992 +/-(0.280)	1.08 +/-(0.272)	1.09 +/-(0.362)	1.32 +/-(0.246)	1.31 +/-(0.407)	1.51 +/-(0.451)
Radium-226+228	pCi/g	4.49 +/-(0.688)J	3.13 +/-(0.493)	2.16 +/-(0.363)	1.76 +/-(0.433)	2.66 +/-(0.335)J	2.24 +/-(0.488)J	2.68 +/-(0.548)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-1004ALT2A	CUF-BG01						CUF-BG02	
Sample Date		6-Dec-18	27-Aug-18	27-Aug-18	27-Aug-18	27-Aug-18	27-Aug-18	27-Aug-18	22-Aug-18	22-Aug-18
Sample ID		CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206	CUF-BS-BG01-0.0/0.5-20180827	CUF-BS-BG01-1.0/3.0-20180827	CUF-BS-BG01-6.5/8.5-20180827	CUF-BS-BG01-11.5/13.5-20180827	CUF-BS-BG01-16.5/18.5-20180827	CUF-BS-BG01-21.5/23.5-20180827	CUF-BS-BG02-0/0.5-20180822	CUF-BS-BG02-1.5/3.5-20180822
Sample Depth		16.5 - 18 ft	0 - 0.5 ft	1 - 3 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	0 - 0.5 ft	1.5 - 3.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Final-Verified	Validated	Validated	Validated	Validated	Validated	Validated	Final-Verified	Final-Verified
	Units									
Radiological Parameters										
Radium-226	pCi/g	1.17 +/-(0.287)	2.37 +/-(0.498)	6.87 +/-(0.852)	13.2 +/-(1.59)	6.46 +/-(0.855)	4.14 +/-(0.574)	9.96 +/-(1.23)	1.36 +/-(0.297)	0.778 +/-(0.195)
Radium-228	pCi/g	1.35 +/-(0.365)	1.05 +/-(0.446)	1.55 +/-(0.431)	2.50 +/-(0.713)	2.18 +/-(0.533)	1.40 +/-(0.425)	1.74 +/-(0.500)	1.08 +/-(0.301)	1.17 +/-(0.232)
Radium-226+228	pCi/g	2.52 +/-(0.464)	3.42 +/-(0.669)	8.42 +/-(0.955)	15.7 +/-(1.74)	8.64 +/-(1.01)	5.54 +/-(0.714)	11.7 +/-(1.33)	2.44 +/-(0.423)	1.95 +/-(0.303)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG02	CUF-BG03			CUF-BG04			
Sample Date		22-Aug-18	22-Aug-18	22-Aug-18	22-Aug-18	23-Aug-18	23-Aug-18	23-Aug-18	23-Aug-18
Sample ID		CUF-BS-BG02-5.0/7.6-20180822	CUF-BS-BG03-0/0.5-20180822	CUF-BS-BG03-1.2/3.2-20180822	CUF-BS-BG03-5.2/7.2-20180822	CUF-BS-BG04-0.0/0.5-20180823	CUF-BS-BG04-1.5/3.5-20180823	CUF-BS-BG04-6.5/8.5-20180823	CUF-BS-BG04-10.0/11.4-20180823
Sample Depth		5 - 7.6 ft	0 - 0.5 ft	1.2 - 3.2 ft	5.2 - 7.2 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	10 - 11.4 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
	Units								
Radiological Parameters									
Radium-226	pCi/g	0.498 +/-(0.213)	1.48 +/-(0.313)	1.63 +/-(0.369)	1.39 +/-(0.319)	1.44 +/-(0.274)	1.91 +/-(0.417)	1.42 +/-(0.316)	1.95 +/-(0.408)
Radium-228	pCi/g	0.760 +/-(0.266)	1.09 +/-(0.311)	0.884 +/-(0.401)	1.30 +/-(0.305)	1.09 +/-(0.298)J	1.85 +/-(0.444)J	1.78 +/-(0.317)J	1.61 +/-(0.520)J
Radium-226+228	pCi/g	1.26 +/-(0.341)	2.57 +/-(0.441)	2.51 +/-(0.545)	2.69 +/-(0.441)	2.53 +/-(0.405)J	3.77 +/-(0.609)J	3.21 +/-(0.448)J	3.55 +/-(0.661)J

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG05				CUF-BG06			CUF-BG07	
Sample Date		29-Nov-18	29-Nov-18	29-Nov-18	29-Nov-18	4-Dec-18	4-Dec-18	4-Dec-18	21-Aug-18	21-Aug-18
Sample ID		CUF-BS-BG05-0.0/0.5-20181129	CUF-BS-BG05-2.5/4.5-20181129	CUF-BS-BG05-6.5/8.5-20181129	CUF-BS-BG05-11.5/13.5-20181129	CUF-BS-BG06-0.0/0.5-20181204	CUF-BS-BG06-0.5/2.5-20181204	CUF-BS-BG06-6.8/8.8-20181204	CUF-BS-BG07-0/0.66-20180821	CUF-BS-BG07-1.5/3.5-20180821
Sample Depth		0 - 0.5 ft	2.5 - 4.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	0 - 0.5 ft	0.5 - 2.5 ft	6.8 - 8.8 ft	0 - 0.66 ft	1.5 - 3.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Validated	Validated	Validated	Validated	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
Radiological Parameters										
Radium-226	pCi/g	1.15 +/-(0.342)	0.796 +/-(0.260)	0.201 +/-(0.180)U	0.677 +/-(0.219)	0.737 +/-(0.296)	1.81 +/-(0.418)	1.14 +/-(0.321)	0.836 +/-(0.285)	0.284 +/-(0.147)
Radium-228	pCi/g	1.03 +/-(0.389)	1.10 +/-(0.348)	1.42 +/-(0.384)	1.20 +/-(0.370)	1.67 +/-(0.388)	1.56 +/-(0.494)	1.75 +/-(0.438)	1.10 +/-(0.344)	0.297 +/-(0.300)U
Radium-226+228	pCi/g	2.18 +/-(0.518)	1.90 +/-(0.434)	1.62 +/-(0.424)J	1.88 +/-(0.430)	2.41 +/-(0.488)	3.37 +/-(0.647)	2.89 +/-(0.543)	1.94 +/-(0.447)	0.581 +/-(0.334)J

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG07					CUF-BG08		
Sample Date		21-Aug-18	21-Aug-18	21-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18
Sample ID		CUF-BS-BG07-6.1/8.1-20180821	CUF-BS-BG07-11.6/13.6-20180821	CUF-BS-BG07-15.5/17.5-20180821	CUF-BS-BG08-0.0/0.5-20180824	CUF-BS-BG08-0.9/2.9-20180824	CUF-BS-FD01-20180824	CUF-BS-BG08-6.5/8.5-20180824	CUF-BS-BG08-10.0/12.0-20180824
Sample Depth		6.1 - 8.1 ft	11.6 - 13.6 ft	15.5 - 17.5 ft	0 - 0.5 ft	0.9 - 2.9 ft	0.9 - 2.9 ft	6.5 - 8.5 ft	10 - 12 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
	Units								
Radiological Parameters									
Radium-226	pCi/g	0.206 +/-(0.196)U	0.425 +/-(0.183)	0.907 +/-(0.265)	1.30 +/-(0.377)	1.37 +/-(0.310)	1.55 +/-(0.354)	1.76 +/-(0.385)	2.13 +/-(0.421)
Radium-228	pCi/g	0.904 +/-(0.320)	1.43 +/-(0.339)	1.39 +/-(0.435)	1.03 +/-(0.529)	1.12 +/-(0.293)	0.972 +/-(0.453)	1.90 +/-(0.459)	1.21 +/-(0.358)
Radium-226+228	pCi/g	1.11 +/-(0.375)J	1.85 +/-(0.385)	2.30 +/-(0.509)	2.33 +/-(0.650)	2.49 +/-(0.427)	2.53 +/-(0.575)	3.66 +/-(0.599)	3.34 +/-(0.553)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG09					CUF-BG10			
Sample Date		23-Aug-18	23-Aug-18	23-Aug-18	23-Aug-18	23-Aug-18	5-Dec-18	5-Dec-18	5-Dec-18	5-Dec-18
Sample ID		CUF-BS-BG09-0.0/0.5-20180823	CUF-BS-BG09-1.5/3.5-20180823	CUF-BS-BG09-6.5/8.5-20180823	CUF-BS-BG09-11.5/13.5-20180823	CUF-BS-BG09-16.5/18.5-20180823	CUF-BS-BG10-0.0/0.5-20181205	CUF-BS-DUP02-20181205	CUF-BS-BG10-1.0/3.0-20181205	CUF-BS-BG10-5.6/7.6-20181205
Sample Depth		0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	0 - 0.5 ft	0 - 0.5 ft	1 - 3 ft	5.6 - 7.6 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
Radiological Parameters										
Radium-226	pCi/g	1.39 +/-(0.331)	1.40 +/-(0.304)	1.93 +/-(0.407)	2.36 +/-(0.417)	2.20 +/-(0.380)	0.729 +/-(0.190)J	0.833 +/-(0.271)J	1.31 +/-(0.306)J	0.852 +/-(0.252)J
Radium-228	pCi/g	1.37 +/-(0.353)J	1.07 +/-(0.293)J	1.28 +/-(0.491)J	2.14 +/-(0.485)J	1.89 +/-(0.406)J	0.993 +/-(0.259)	1.28 +/-(0.578)	1.14 +/-(0.362)	1.60 +/-(0.363)
Radium-226+228	pCi/g	2.76 +/-(0.484)J	2.47 +/-(0.422)J	3.21 +/-(0.638)J	4.50 +/-(0.640)J	4.08 +/-(0.556)J	1.72 +/-(0.321)J	2.11 +/-(0.638)J	2.45 +/-(0.474)J	2.45 +/-(0.442)J

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG11				CUF-BG12			
Sample Date		6-Dec-18	6-Dec-18	6-Dec-18	6-Dec-18	6-Dec-18	6-Dec-18	6-Dec-18	6-Dec-18
Sample ID		CUF-BS-BG11-0.0/0.5-20181206	CUF-BS-BG11-1.0/3.0-20181206	CUF-BS-BG11-6.5/8.5-20181206	CUF-BS-BG11-11.2/13.2-20181206	CUF-BS-BG12-0.0/0.5-20181206	CUF-BS-BG12-2.5/4.5-20181206	CUF-BS-BG12-6.5/8.5-20181206	CUF-BS-BG12-10.6/12.6-20181206
Sample Depth		0 - 0.5 ft	1 - 3 ft	6.5 - 8.5 ft	11.2 - 13.2 ft	0 - 0.5 ft	2.5 - 4.5 ft	6.5 - 8.5 ft	10.6 - 12.6 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
Radiological Parameters									
Radium-226	pCi/g	1.08 +/-(0.246)	1.15 +/-(0.296)	1.48 +/-(0.331)	1.02 +/-(0.247)	1.12 +/-(0.239)	0.872 +/-(0.218)	0.937 +/-(0.223)	0.812 +/-(0.195)
Radium-228	pCi/g	0.694 +/-(0.303)	1.61 +/-(0.404)	2.25 +/-(0.492)	1.09 +/-(0.252)	1.09 +/-(0.263)	0.938 +/-(0.232)	0.381 +/-(0.329)U	0.917 +/-(0.238)
Radium-226+228	pCi/g	1.77 +/-(0.390)	2.76 +/-(0.501)	3.73 +/-(0.593)	2.11 +/-(0.353)	2.21 +/-(0.355)	1.81 +/-(0.318)	1.32 +/-(0.397)J	1.73 +/-(0.308)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG13				CUF-BG14			
Sample Date		28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18
Sample ID		CUF-BS-BG13-0.0/0.5-20180828	CUF-BS-FD02-20180828	CUF-BS-BG13-0.75/2.75-20180828	CUF-BS-BG13-6.5/8.5-20180828	CUF-BS-BG14-0.0/0.5-20180828	CUF-BS-BG14-1.0/3.0-20180828	CUF-BS-BG14-6.5/8.5-20180828	CUF-BS-BG14-10.3/12.3-20180828
Sample Depth		0 - 0.5 ft	0 - 0.5 ft	0.75 - 2.75 ft	6.5 - 8.5 ft	0 - 0.5 ft	1 - 3 ft	6.5 - 8.5 ft	10.3 - 12.3 ft
Sample Type		Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
	Units								
Radiological Parameters									
Radium-226	pCi/g	0.864 +/-(0.175)	0.831 +/-(0.277)	0.606 +/-(0.247)	0.902 +/-(0.316)	0.909 +/-(0.265)	0.853 +/-(0.220)	1.52 +/-(0.353)	0.962 +/-(0.281)
Radium-228	pCi/g	1.32 +/-(0.242)	1.72 +/-(0.493)	1.36 +/-(0.410)	1.83 +/-(0.345)	1.03 +/-(0.370)	1.32 +/-(0.312)	1.66 +/-(0.366)	1.62 +/-(0.416)
Radium-226+228	pCi/g	2.19 +/-(0.299)	2.55 +/-(0.565)	1.96 +/-(0.479)	2.73 +/-(0.468)	1.94 +/-(0.455)	2.17 +/-(0.382)	3.18 +/-(0.508)	2.58 +/-(0.502)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG15				CUF-BG16		
Sample Date		29-Nov-18	29-Nov-18	29-Nov-18	29-Nov-18	3-Dec-18	3-Dec-18	3-Dec-18
Sample ID		CUF-BS-BG15-0.0/0.5-20181129	CUF-BS-BG15-1.9/3.9-20181129	CUF-BS-DUP01-20181129	CUF-BS-BG15-6.5/8.5-20181129	CUF-BS-BG16-0.0/0.5-20181203	CUF-BS-BG16-0.8/2.8-20181203	CUF-BS-BG16-5.0/6.8-20181203
Sample Depth		0 - 0.5 ft	1.9 - 3.9 ft	1.9 - 3.9 ft	6.5 - 8.5 ft	0 - 0.5 ft	0.8 - 2.8 ft	5 - 6.8 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Validated	Validated	Validated	Validated	Final-Verified	Final-Verified	Final-Verified
	Units							
Radiological Parameters								
Radium-226	pCi/g	1.41 +/-(0.337)	1.02 +/-(0.324)	0.912 +/-(0.251)	0.646 +/-(0.209)	9.68 +/-(1.30)	9.57 +/-(1.20)	7.59 +/-(1.04)
Radium-228	pCi/g	1.32 +/-(0.394)	1.33 +/-(0.433)	1.32 +/-(0.388)	1.72 +/-(0.378)	1.53 +/-(0.470)	1.49 +/-(0.456)	0.563 +/-(0.539)U
Radium-226+228	pCi/g	2.73 +/-(0.518)	2.35 +/-(0.541)	2.23 +/-(0.462)	2.37 +/-(0.432)	11.2 +/-(1.38)	11.1 +/-(1.28)	8.15 +/-(1.17)J

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location		CUF-BG17				
Sample Date		30-Nov-18	30-Nov-18	30-Nov-18	30-Nov-18	30-Nov-18
Sample ID		CUF-BS-BG17-0.0/0.5-20181130	CUF-BS-BG17-0.75/2.75-20181130	CUF-BS-BG17-6.0/8.0-20181130	CUF-BS-BG17-11.25/13.25-20181130	CUF-BS-BG17-15.0/16.9-20181130
Sample Depth		0 - 0.5 ft	0.75 - 2.75 ft	6 - 8 ft	11.25 - 13.25 ft	15 - 16.9 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Validated	Validated	Validated	Validated	Validated
	Units					
Radiological Parameters						
Radium-226	pCi/g	1.42 +/-(0.309)	1.04 +/-(0.253)	1.07 +/-(0.242)	1.03 +/-(0.215)	0.712 +/-(0.203)
Radium-228	pCi/g	0.982 +/-(0.284)	1.07 +/-(0.237)	0.837 +/-(0.345)	1.08 +/-(0.379)	1.02 +/-(0.282)
Radium-226+228	pCi/g	2.40 +/-(0.420)	2.11 +/-(0.347)	1.91 +/-(0.421)	2.11 +/-(0.436)	1.73 +/-(0.347)

Notes:

ft	feet below ground surface
ID	identification
J	quantitation is approximate due to limitations identified during data validation
pCi/g	picoCurie per gram
U	not detected

1. Level of review is defined in the Quality Assurance Project Plan.
2. The 0-0.5 foot sample was collected using a hand auger when accessible during the drilling operations at that boring location; it may or may not have been the first sample obtained and thus could have a different sample date.
3. Samples collected at CUF-1001 were collected from boring location CUF-1001ALT2.
4. Samples collected at CUF-1001ALT were eliminated from data set due to presence of ash.

TABLE B.4 - Soil Field pH Results
Cumberland Fossil Plant August
2018 - April 2019

Sample Location	Sample ID	Sample Date	Sample Depth	pH (field)
				SU
CUF-1000ALTA	CUF-BS-CUF1000ALTA-13.5/15.0-20181129	11/29/2018	13.5 - 15 ft	8.03
	CUF-BS-CUF1000ALTA-18.0/19.5-20181129	11/29/2018	18 - 19.5 ft	7.80
CUF-1001ALT	CUF-BS-CUF-1001ALT-13.5/15.0-20181212	12/12/2018	13.5 - 15 ft	8.26
	CUF-BS-CUF-1001ALT-19.5/21.0-20181213	12/13/2018	19.5 - 21 ft	8.06
CUF-1001ALT2	CUF-BS-CUF1001-12.0/16.5-20190410	4/10/2019	12 - 16.5 ft	8.67
CUF-1004ALT2A	CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206	12/6/2018	12 - 13.5 ft	5.39
	CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206	12/6/2018	16.5 - 18 ft	6.02
CUF-BG01	CUF-BS-BG01-0.0/0.5-20180827	8/27/2018	0 - 0.5 ft	6.49
	CUF-BS-BG01-1.0/3.0-20180827	8/27/2018	1 - 3 ft	5.16
	CUF-BS-BG01-6.5/8.5-20180827	8/27/2018	6.5 - 8.5 ft	3.87
	CUF-BS-BG01-11.5/13.5-20180827	8/27/2018	11.5 - 13.5 ft	4.00
	CUF-BS-BG01-16.5/18.5-20180827	8/27/2018	16.5 - 18.5 ft	4.32
	CUF-BS-BG01-21.5/23.5-20180827	8/27/2018	21.5 - 23.5 ft	3.90
CUF-BG02	CUF-BS-BG02-1.5/3.5-20180822	8/22/2018	1.5 - 3.5 ft	6.08
	CUF-BS-BG02-5.0/7.6-20180822	8/22/2018	5 - 7.6 ft	8.47
CUF-BG03	CUF-BS-BG03-1.2/3.2-20180822	8/22/2018	1.2 - 3.2 ft	5.07
	CUF-BS-BG03-5.2/7.2-20180822	8/22/2018	5.2 - 7.2 ft	6.57
CUF-BG04	CUF-BS-BG04-0.0/0.5-20180823	8/23/2018	0 - 0.5 ft	6.68
	CUF-BS-BG04-1.5/3.5-20180823	8/23/2018	1.5 - 3.5 ft	6.56
	CUF-BS-BG04-6.5/8.5-20180823	8/23/2018	6.5 - 8.5 ft	6.87
	CUF-BS-BG04-10.0/11.4-20180823	8/23/2018	10 - 11.4 ft	7.32
CUF-BG05	CUF-BS-BG05-0.0/0.5-20181129	11/29/2018	0 - 0.5 ft	6.38
	CUF-BS-BG05-2.5/4.5-20181129	11/29/2018	2.5 - 4.5 ft	5.23
	CUF-BS-BG05-6.5/8.5-20181129	11/29/2018	6.5 - 8.5 ft	5.56
	CUF-BS-BG05-11.5/13.5-20181129	11/29/2018	11.5 - 13.5 ft	5.45
CUF-BG06	CUF-BS-BG06-0.0/0.5-20181204	12/4/2018	0 - 0.5 ft	6.25
	CUF-BS-BG06-0.5/2.5-20181204	12/4/2018	0.5 - 2.5 ft	6.82
	CUF-BS-BG06-6.8/8.8-20181204	12/4/2018	6.8 - 8.8 ft	6.48
CUF-BG07	CUF-BS-BG07-0/0.66-20180821	8/21/2018	0 - 0.66 ft	4.90
	CUF-BS-BG07-1.5/3.5-20180821	8/21/2018	1.5 - 3.5 ft	4.15
	CUF-BS-BG07-6.1/8.1-20180821	8/21/2018	6.1 - 8.1 ft	4.55
	CUF-BS-BG07-11.6/13.6-20180821	8/21/2018	11.6 - 13.6 ft	4.84
	CUF-BS-BG07-15.5/17.5-20180821	8/21/2018	15.5 - 17.5 ft	5.68
CUF-BG08	CUF-BS-BG08-0.0/0.5-20180824	8/24/2018	0 - 0.5 ft	7.05
	CUF-BS-BG08-0.9/2.9-20180824	8/24/2018	0.9 - 2.9 ft	7.19
	CUF-BS-BG08-6.5/8.5-20180824	8/24/2018	6.5 - 8.5 ft	7.33
	CUF-BS-BG08-10.0/12.0-20180824	8/24/2018	10 - 12 ft	7.20
CUF-BG09	CUF-BS-BG09-0.0/0.5-20180823	8/23/2018	0 - 0.5 ft	5.79
	CUF-BS-BG09-1.5/3.5-20180823	8/23/2018	1.5 - 3.5 ft	5.45
	CUF-BS-BG09-6.5/8.5-20180823	8/23/2018	6.5 - 8.5 ft	4.06
	CUF-BS-BG09-11.5/13.5-20180823	8/23/2018	11.5 - 13.5 ft	4.46
	CUF-BS-BG09-16.5/18.5-20180823	8/23/2018	16.5 - 18.5 ft	4.99
CUF-BG10	CUF-BS-BG10-0.0/0.5-20181205	12/5/2018	0 - 0.5 ft	7.24
	CUF-BS-BG10-1.0/3.0-20181205	12/5/2018	1 - 3 ft	6.13
	CUF-BS-BG10-5.6/7.6-20181205	12/5/2018	5.6 - 7.6 ft	5.60
CUF-BG11	CUF-BS-BG11-0.0/0.5-20181206	12/6/2018	0 - 0.5 ft	6.20
	CUF-BS-BG11-1.0/3.0-20181206	12/6/2018	1 - 3 ft	5.80
	CUF-BS-BG11-6.5/8.5-20181206	12/6/2018	6.5 - 8.5 ft	6.03
	CUF-BS-BG11-11.2/13.2-20181206	12/6/2018	11.2 - 13.2 ft	5.63
CUF-BG12	CUF-BS-BG12-0.0/0.5-20181206	12/6/2018	0 - 0.5 ft	6.70
	CUF-BS-BG12-2.5/4.5-20181206	12/6/2018	2.5 - 4.5 ft	5.13
	CUF-BS-BG12-6.5/8.5-20181206	12/6/2018	6.5 - 8.5 ft	5.69
	CUF-BS-BG12-10.6/12.6-20181206	12/6/2018	10.6 - 12.6 ft	5.02

See notes on last page.

TABLE B.4 - Soil Field pH Results
Cumberland Fossil Plant
August 2018 - April 2019

Sample Location	Sample ID	Sample Date	Sample Depth	pH (field)
				SU
CUF-BG13	CUF-BS-BG13-0.0/0.5-20180828	8/28/2018	0 - 0.5 ft	7.38
	CUF-BS-BG13-0.75/2.75-20180828	8/28/2018	0.75 - 2.75 ft	7.17
	CUF-BS-BG13-6.5/8.5-20180828	8/28/2018	6.5 - 8.5 ft	8.17
CUF-BG14	CUF-BS-BG14-0.0/0.5-20180828	8/28/2018	0 - 0.5 ft	7.10
	CUF-BS-BG14-1.0/3.0-20180828	8/28/2018	1 - 3 ft	7.41
	CUF-BS-BG14-6.5/8.5-20180828	8/28/2018	6.5 - 8.5 ft	6.75
	CUF-BS-BG14-10.3/12.3-20180828	8/28/2018	10.3 - 12.3 ft	8.13
CUF-BG15	CUF-BS-BG15-0.0/0.5-20181129	11/29/2018	0 - 0.5 ft	5.56
	CUF-BS-BG15-1.9/3.9-20181129	11/29/2018	1.9 - 3.9 ft	4.79
	CUF-BS-BG15-6.5/8.5-20181129	11/29/2018	6.5 - 8.5 ft	7.34
CUF-BG16	CUF-BS-BG16-0.0/0.5-20181203	12/3/2018	0 - 0.5 ft	5.87
	CUF-BS-BG16-0.8/2.8-20181203	12/3/2018	0.8 - 2.8 ft	5.45
	CUF-BS-BG16-5.0/6.8-20181203	12/3/2018	5 - 6.8 ft	5.58
CUF-BG17	CUF-BS-BG17-0.0/0.5-20181130	11/30/2018	0 - 0.5 ft	6.98
	CUF-BS-BG17-0.75/2.75-20181130	11/30/2018	0.75 - 2.75 ft	5.07
	CUF-BS-BG17-6.0/8.0-20181130	11/30/2018	6 - 8 ft	6.49
	CUF-BS-BG17-11.25/13.25-20181130	11/30/2018	11.25 - 13.25 ft	7.61
	CUF-BS-BG17-15.0/16.9-20181130	11/30/2018	15 - 16.9 ft	6.83

Notes:

ft	feet below ground surface
ID	identification
SU	Standard Unit

APPENDIX C – SUBSURFACE LOGS

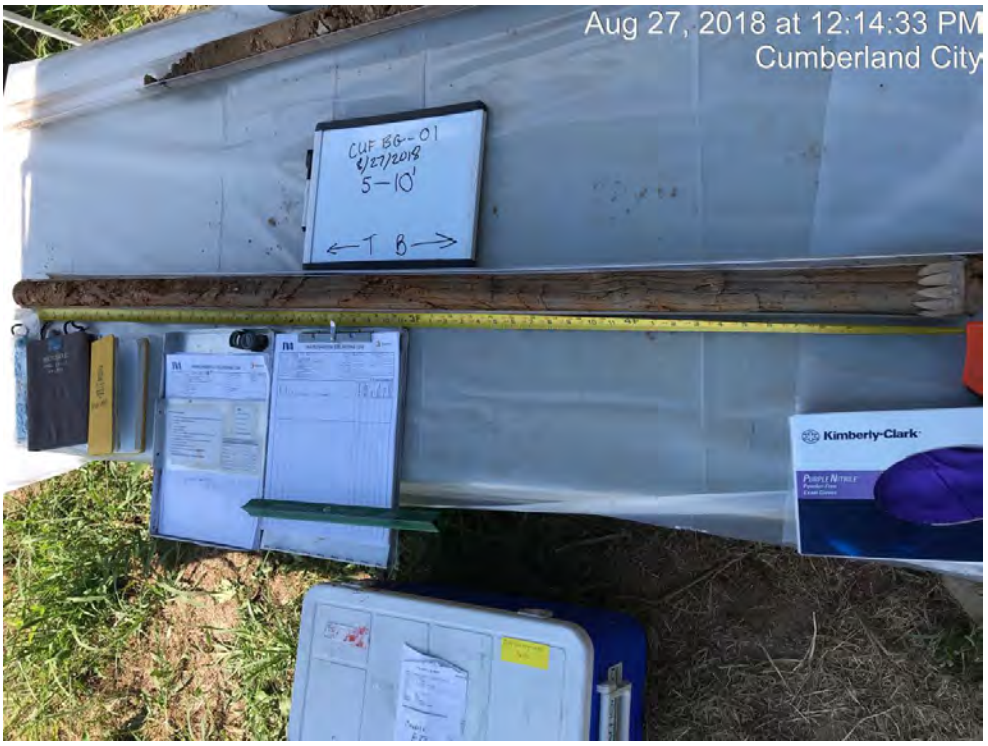
REFER TO
APPENDIX B.1 - BACKGROUND SOILS

APPENDIX D – PHOTOGRAPHIC LOGS

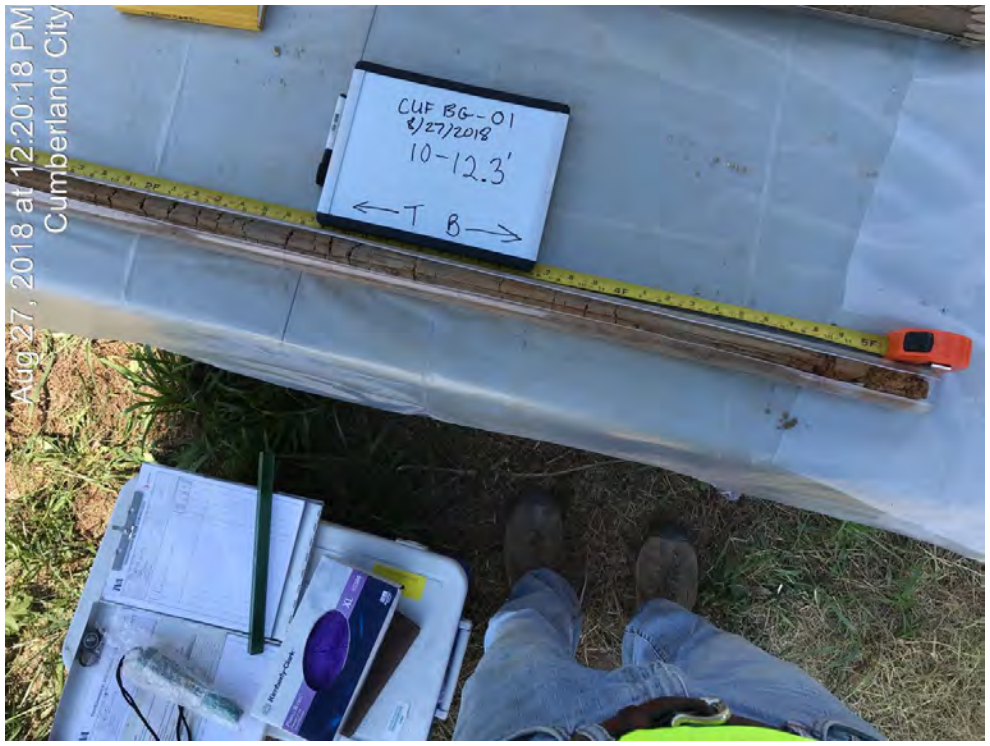
ATTACHMENT D.1

Photographic Logs of Soil Cores – Phase I

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 1 **Photo Location:** CUF-BG01 **Photo Date:** 8/27/2018 **Comments:** First boring location interval (0.0-5.0 feet).	
Photograph ID: 2 **Photo Location:** CUF-BG01 **Photo Date:** 8/27/2018 **Comments:** First boring location interval (5.0-10.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 3 **Photo Location:** CUF-BG01 **Photo Date:** 8/27/2018 **Comments:** First boring location interval (10.0-12.5 feet). Boring refusal at 12.3 feet.	
Photograph ID: 4 **Photo Location:** CUF-BG01 **Photo Date:** 8/27/2018 **Comments:** Second boring location interval (0.0-5.0 feet). Offset 36 feet to the northwest of the first boring.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 5 **Photo Location:** CUF-BG01 **Photo Date:** 8/27/2018 **Comments:** Second boring location interval (5.0-6.0 feet). Boring refusal at 6.0 feet.	
Photograph ID: 6 **Photo Location:** CUF-BG01 **Photo Date:** 8/27/2018 **Comments:** Third boring location (0.0-5.0 feet). Offset 43 feet to the southeast of the first boring.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 7 **Photo Location:** CUF-BG01 **Photo Date:** 8/27/2018 **Comments:** Third boring location interval (5.0-10.0 feet).	
Photograph ID: 8 **Photo Location:** CUF-BG01 **Photo Date:** 8/27/2018 **Comments:** Third boring location interval (10.0-15.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 9 **Photo Location:** CUF-BG01 **Photo Date:** 8/27/2018 **Comments:** Third boring location interval (15.0-20.0 feet).	
Photograph ID: 10 **Photo Location:** CUF-BG01 **Photo Date:** 8/27/2018 **Comments:** Third boring location interval (20.0-25.0 feet). Boring refusal at 25 feet.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 11

Photo Location:
CUF-BG02

Photo Date:
8/22/2018

Comments:
First boring location interval (0.0-2.5 feet). Boring refusal at 2.5 feet.

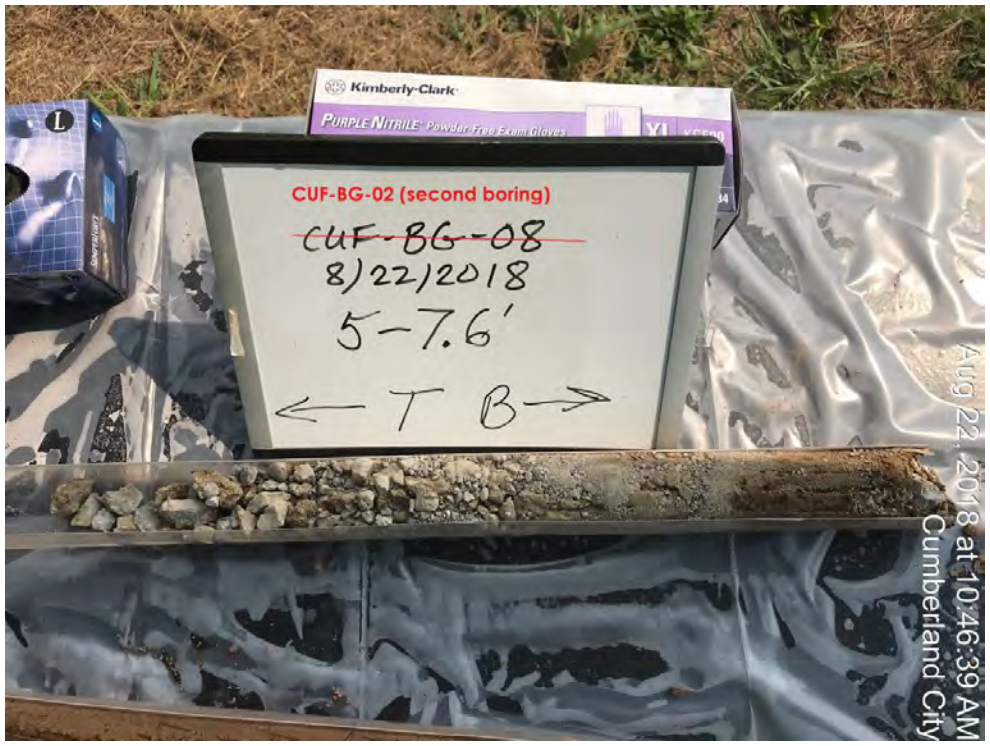
Photograph ID: 12

Photo Location:
CUF-BG02

Photo Date:
8/22/2018

Comments:
Second boring location interval (0.0-5.0 feet). Offset 40 feet to the southeast of the first boring.

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 13 **Photo Location:** CUF-BG02 **Photo Date:** 8/22/2018 **Comments:** Second boring location interval (5.0-7.6 feet). Boring refusal at 7.6 feet.	
Photograph ID: 14 **Photo Location:** CUF-BG02 **Photo Date:** 8/22/2018 **Comments:** Third boring location interval (0.0-5.0 feet). Offset 19 feet to the southeast of the second boring.	

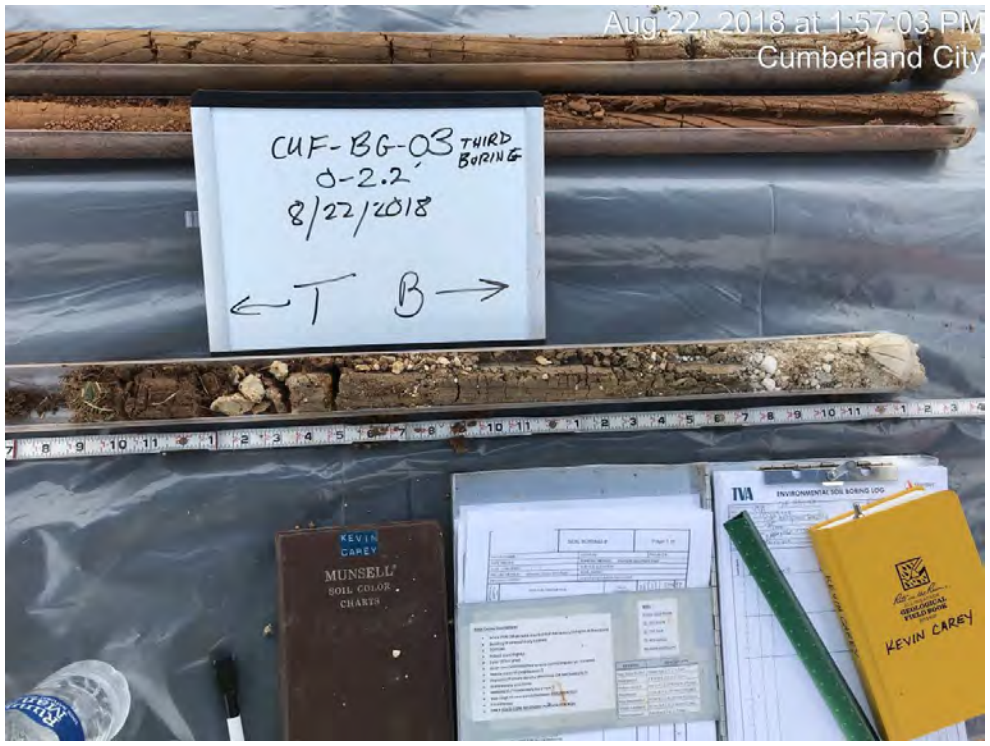
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 15 **Photo Location:** CUF-BG02 **Photo Date:** 8/22/2018 **Comments:** Third boring location interval (5.0-6.3 feet). Boring refusal at 6.3 feet.	
Photograph ID: 16 **Photo Location:** CUF-BG03 **Photo Date:** 8/22/2018 **Comments:** First boring location interval (0.0-5.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 17 **Photo Location:** CUF-BG03 **Photo Date:** 8/22/2018 **Comments:** First boring location interval (5.0-7.4 feet). Boring refusal at 7.4 feet.	
Photograph ID: 18 **Photo Location:** CUF-BG03 **Photo Date:** 8/22/2018 **Comments:** Second boring location interval (0.0-2.8 feet). Offset 44 feet to the south-southeast of the first boring. Boring refusal at 2.8 feet.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 19 **Photo Location:** CUF-BG03 **Photo Date:** 8/22/2018 **Comments:** Third boring location interval (0.0-2.2 feet). Offset 56 feet to the west-northwest of the first boring. Boring refusal at 2.2 feet.	
Photograph ID: 20 **Photo Location:** CUF-BG04 **Photo Date:** 8/23/2018 **Comments:** First boring location interval (0.0-5.0 feet).	

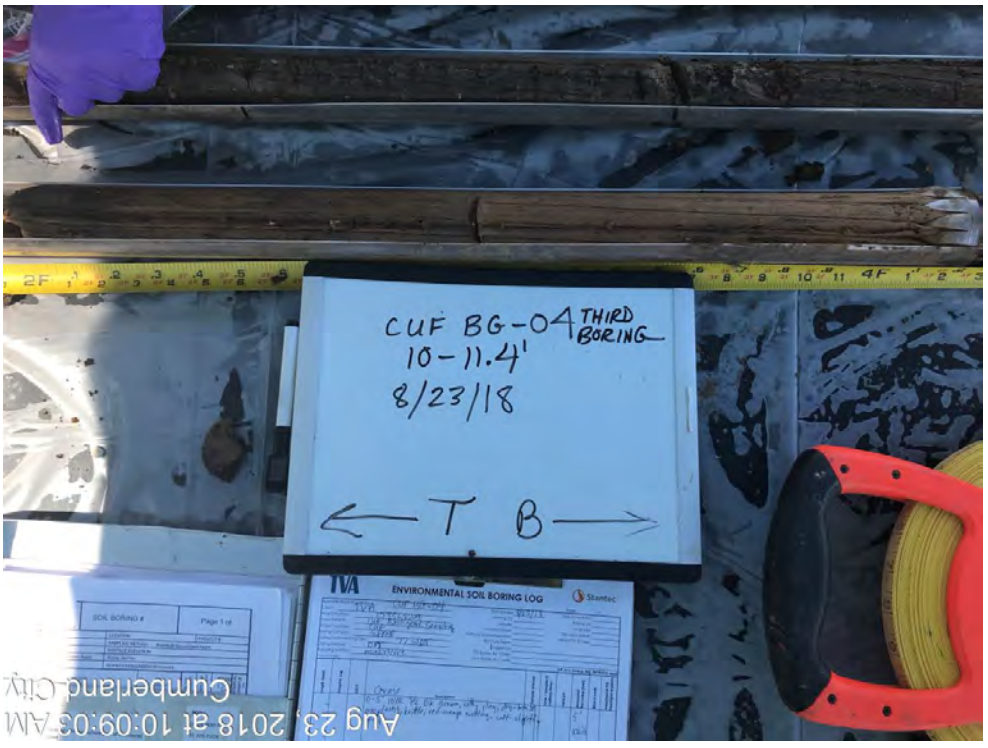
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 21 **Photo Location:** CUF-BG04 **Photo Date:** 8/23/2018 **Comments:** First boring location interval (5.0-7.3 feet). Boring refusal at 7.3 feet.	
Photograph ID: 22 **Photo Location:** CUF-BG04 **Photo Date:** 8/23/2018 **Comments:** Second boring location interval (0.0-5.0 feet). Offset 29 feet to the southeast of the first boring.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 23 **Photo Location:** CUF-BG04 **Photo Date:** 8/23/2018 **Comments:** Second boring location interval (5.0-7.2 feet). Boring refusal at 7.2 feet.	
Photograph ID: 24 **Photo Location:** CUF-BG04 **Photo Date:** 8/23/2018 **Comments:** Third boring location interval (0.0-5.0 feet). Offset 50 feet to the north of the first soil boring.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 25 **Photo Location:** CUF-BG04 **Photo Date:** 8/23/2018 **Comments:** Third boring location interval (5.0-10.0 feet).	
Photograph ID: 26 **Photo Location:** CUF-BG04 **Photo Date:** 8/23/2018 **Comments:** Third boring location interval (10.0-11.4 feet). Boring refusal at 11.4 feet.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 27 **Photo Location:** CUF-BG07 **Photo Date:** 8/21/2018 **Comments:** First boring location interval (0.0-5.0 feet).	
Photograph ID: 28 **Photo Location:** CUF-BG07 **Photo Date:** 8/21/2018 **Comments:** First boring location interval (5.0-10.0 feet).	

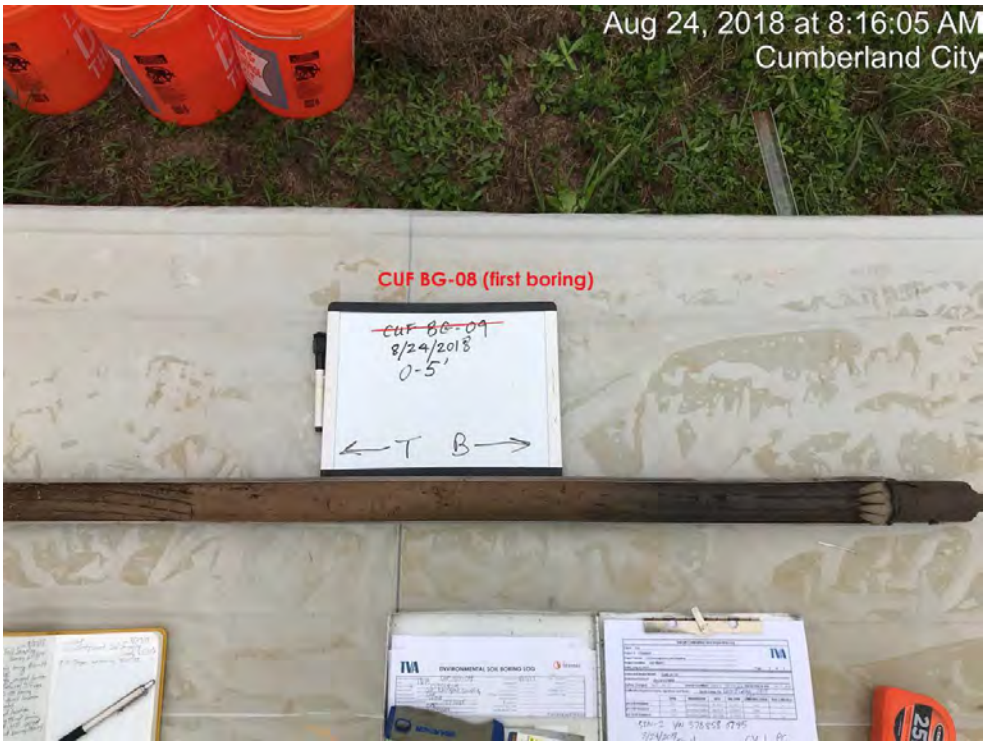
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 29 **Photo Location:** CUF-BG07 **Photo Date:** 8/21/2018 **Comments:** First boring location interval (10.0-11.1 feet). Boring refusal at 11.1 feet.	
Photograph ID: 30 **Photo Location:** CUF-BG07 **Photo Date:** 8/21/2018 **Comments:** Second boring location interval (0.0-5.0 feet). Offset 20 feet from the first soil boring.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 31 **Photo Location:** CUF-BG07 **Photo Date:** 8/21/2018 **Comments:** Second boring location interval (5.0-10.0 feet).	
Photograph ID: 32 **Photo Location:** CUF-BG07 **Photo Date:** 8/21/2018 **Comments:** Second boring location interval (10.0-15.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 33 **Photo Location:** CUF-BG07 **Photo Date:** 8/21/2018 **Comments:** Second boring location interval (15.0-18.0 feet). Boring refusal at 18.0 feet.	
Photograph ID: 34 **Photo Location:** CUF-BG08 **Photo Date:** 8/24/2018 **Comments:** First boring location interval (0.0-5.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 35

Photo Location:
CUF-BG08

Photo Date:
8/24/2018

Comments:
First boring location interval (5.0-10.0 feet).

Photograph ID: 36

Photo Location:
CUF-BG08

Photo Date:
8/24/2018

Comments:
First boring location interval (10.0-12.0 feet). Boring refusal at 12.0 feet.

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 37 **Photo Location:** CUF-BG08 **Photo Date:** 8/24/2018 **Comments:** Second boring location interval (0.0-5.0 feet). Offset 40 feet to the northeast of the first boring.	
Photograph ID: 38 **Photo Location:** CUF-BG08 **Photo Date:** 8/24/2018 **Comments:** Second boring location interval (5.0-10.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 39 **Photo Location:** CUF-BG08 **Photo Date:** 8/24/2018 **Comments:** Second boring location interval (10.0-11.5 feet). Boring refusal at 11.5 feet.	
Photograph ID: 40 **Photo Location:** CUF-BG08 **Photo Date:** 8/24/2018 **Comments:** Third boring location interval (0.0-5.0 feet). Offset 50 feet to the southwest of the first boring.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 41 **Photo Location:** CUF-BG08 **Photo Date:** 8/24/2018 **Comments:** Third boring location interval (5.0-9.4 feet). Boring refusal at 9.4 feet.	
Photograph ID: 42 **Photo Location:** CUF-BG09 **Photo Date:** 8/23/2018 **Comments:** First boring location interval (0.0-5.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 43 **Photo Location:** CUF-BG09 **Photo Date:** 8/23/2018 **Comments:** First boring location interval (5.0-10.0 feet).	
Photograph ID: 44 **Photo Location:** CUF-BG09 **Photo Date:** 8/23/2018 **Comments:** First boring location interval (10.0-12.6 feet). Boring refusal at 12.6 feet.	

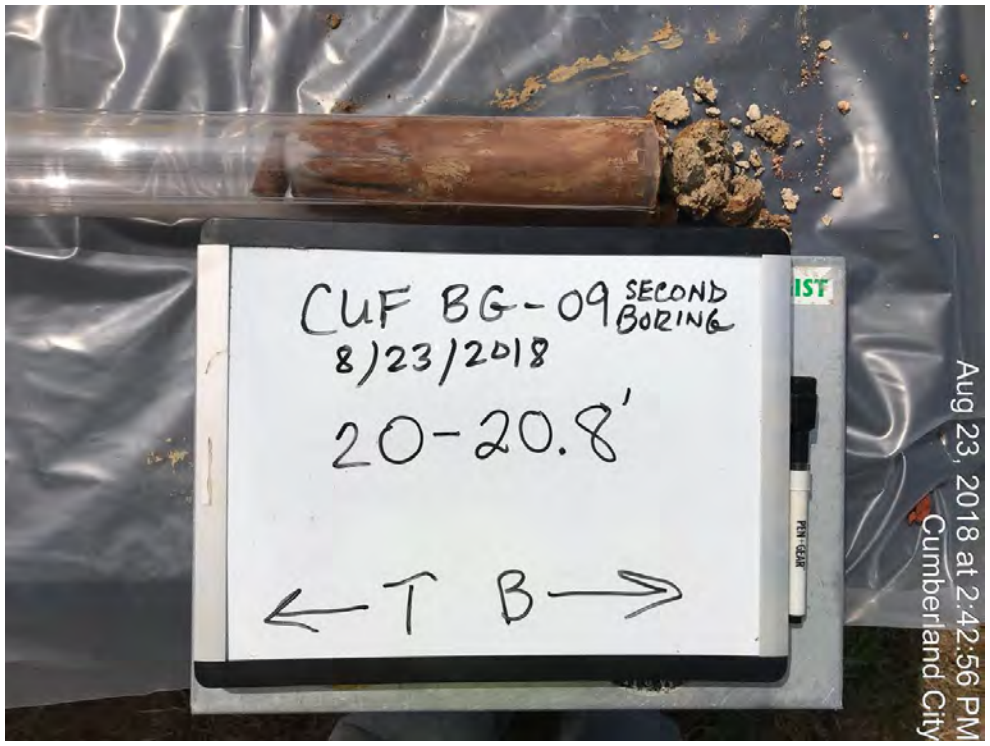
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 45 **Photo Location:** CUF-BG09 **Photo Date:** 8/23/2018 **Comments:** Second boring location interval (0.0-5.0 feet). Offset 54 feet to the north of the first soil boring.	
Photograph ID: 46 **Photo Location:** CUF-BG09 **Photo Date:** 8/23/2018 **Comments:** Second boring location interval (5.0-10.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 47 **Photo Location:** CUF-BG09 **Photo Date:** 8/23/2018 **Comments:** Second boring location interval (10.0-15.0 feet).	
Photograph ID: 48 **Photo Location:** CUF-BG09 **Photo Date:** 8/23/2018 **Comments:** Second boring location interval (15.0-20.0 feet).	

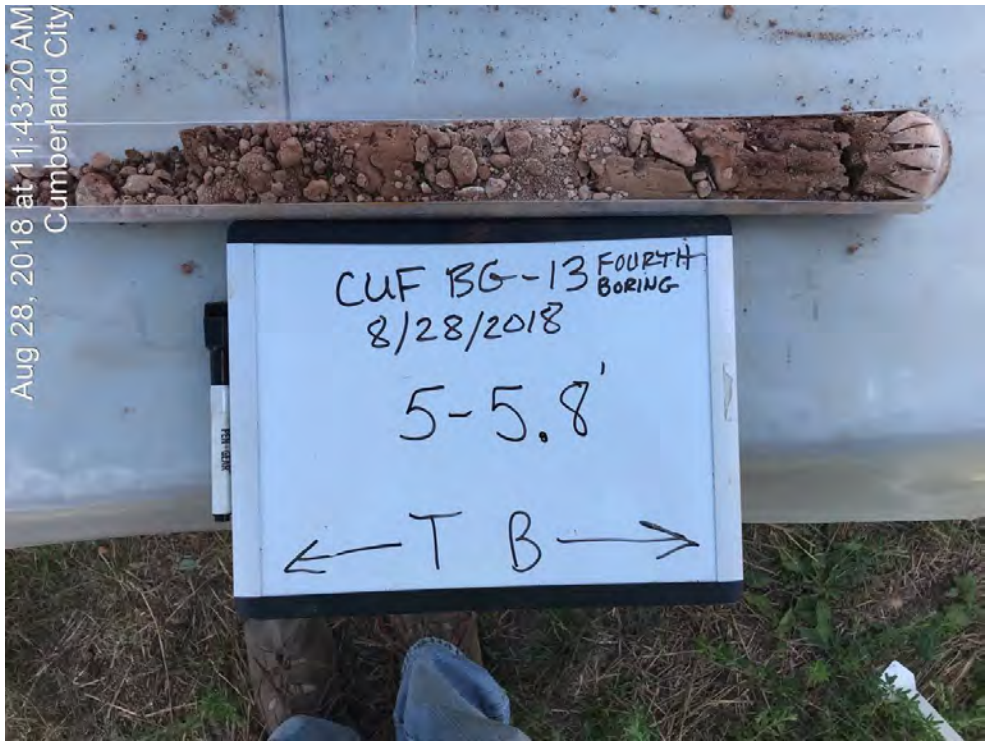
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 49 **Photo Location:** CUF-BG09 **Photo Date:** 8/23/2018 **Comments:** Second boring location interval (20.0-20.8 feet). Boring refusal at 20.8 feet.	
Photograph ID: 50 **Photo Location:** CUF-BG13 **Photo Date:** 8/28/2018 **Comments:** First boring location interval (0.0-5.4 feet). Boring refusal at 5.4 feet.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 51 **Photo Location:** CUF-BG13 **Photo Date:** 8/28/2018 **Comments:** Second boring location interval (0.0-4.5 feet). Offset 45 feet to the southeast of the first boring. Boring refusal at 4.5 feet.	
Photograph ID: 52 **Photo Location:** CUF-BG13 **Photo Date:** 8/28/2018 **Comments:** Third boring location interval (0.0-3.0 feet). Offset 32 feet to the southwest of the first boring. Boring refusal at 3.0 feet.	

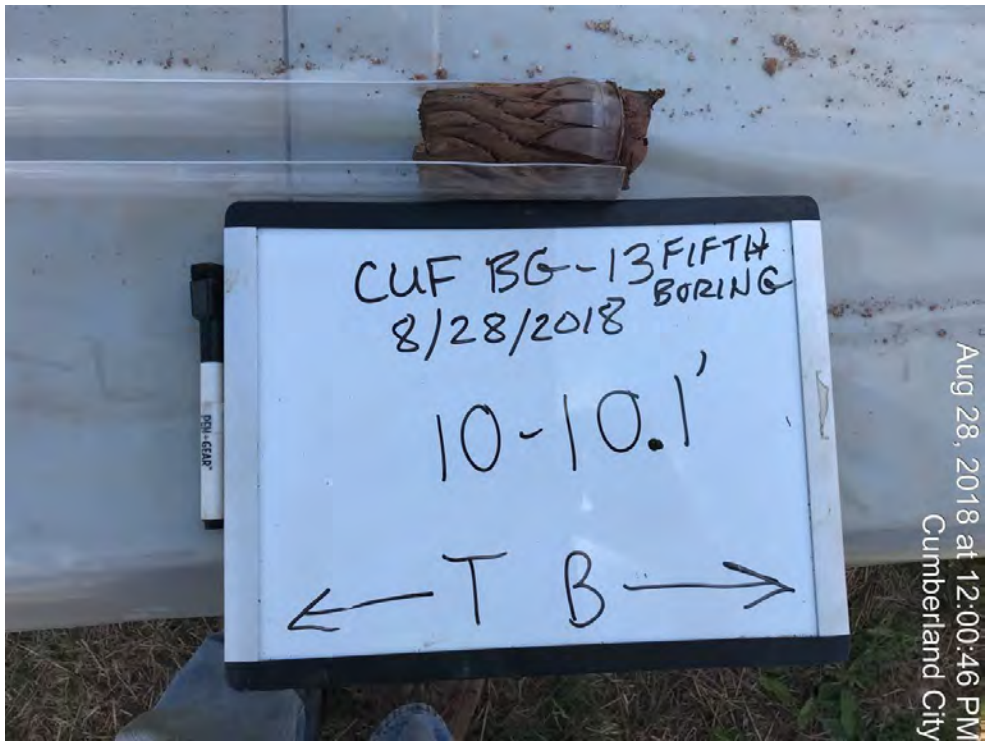
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 53 **Photo Location:** CUF-BG13 **Photo Date:** 8/28/2018 **Comments:** Fourth boring location interval (0.0-5.0 feet). Offset 56 feet to the south of the first boring.	
Photograph ID: 54 **Photo Location:** CUF-BG13 **Photo Date:** 8/28/2018 **Comments:** Fourth boring location interval (5.0-5.8 feet). Boring refusal at 5.8 feet.	

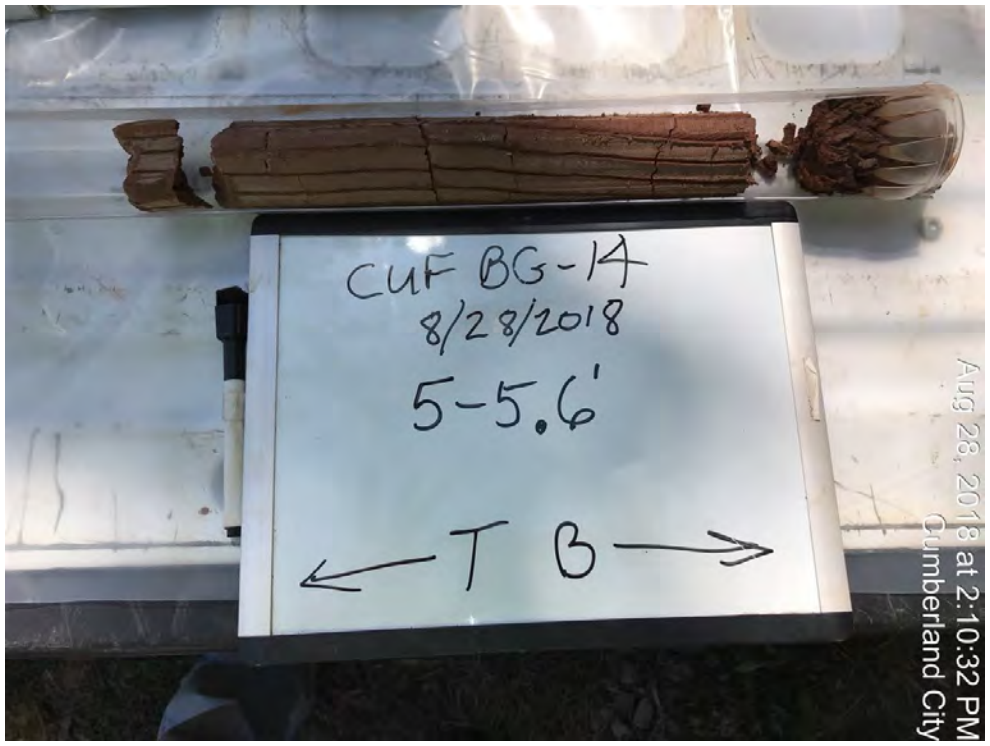
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 55 **Photo Location:** CUF-BG13 **Photo Date:** 8/28/2018 **Comments:** Fifth boring location interval (0.0-5.0 feet). Offset 20 feet to the east of the first boring.	
Photograph ID: 56 **Photo Location:** CUF-BG13 **Photo Date:** 8/28/2018 **Comments:** Fifth boring location interval (5.0-10.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 57 **Photo Location:** CUF-BG13 **Photo Date:** 8/28/2018 **Comments:** Fifth boring location interval (10.0-10.1 feet). Boring refusal at 10.1 feet.	
Photograph ID: 58 **Photo Location:** CUF-BG14 **Photo Date:** 8/28/2018 **Comments:** First boring location interval (0.0-5.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 59 **Photo Location:** CUF-BG14 **Photo Date:** 8/28/2018 **Comments:** First boring location interval (5.0-5.6 feet). Boring refusal at 5.6 feet.	
Photograph ID: 60 **Photo Location:** CUF-BG14 **Photo Date:** 8/28/2018 **Comments:** Photo of second boring location interval (0.0-1.1 feet) not available. Boring refusal at 1.1 feet.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 61 **Photo Location:** CUF-BG14 **Photo Date:** 8/28/2018 **Comments:** Third boring location interval (0.0-5.0 feet). Offset 39 feet west-southwest of the first boring. Boring refusal at 5.0 feet.	
Photograph ID: 62 **Photo Location:** CUF-BG14 **Photo Date:** 8/28/2018 **Comments:** Fourth boring location interval (0.0-5.0 feet). Offset 27 feet west-southwest of the first boring.	

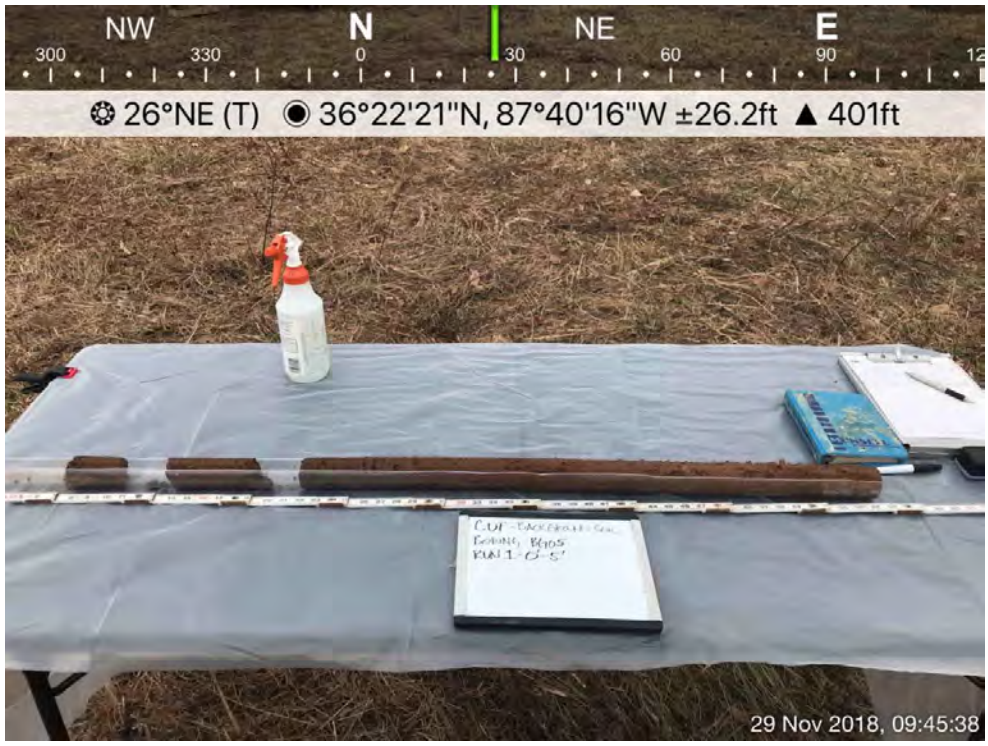
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 63 **Photo Location:** CUF-BG14 **Photo Date:** 8/28/2018 **Comments:** Fourth boring location interval (5.0-10.0 feet).	
Photograph ID: 64 **Photo Location:** CUF-BG14 **Photo Date:** 8/28/2018 **Comments:** Fourth boring location interval (10.0-12.6 feet). Boring refusal at 12.6 feet.	

ATTACHMENT D.2

Photographic Logs of Soil Cores – Phase II

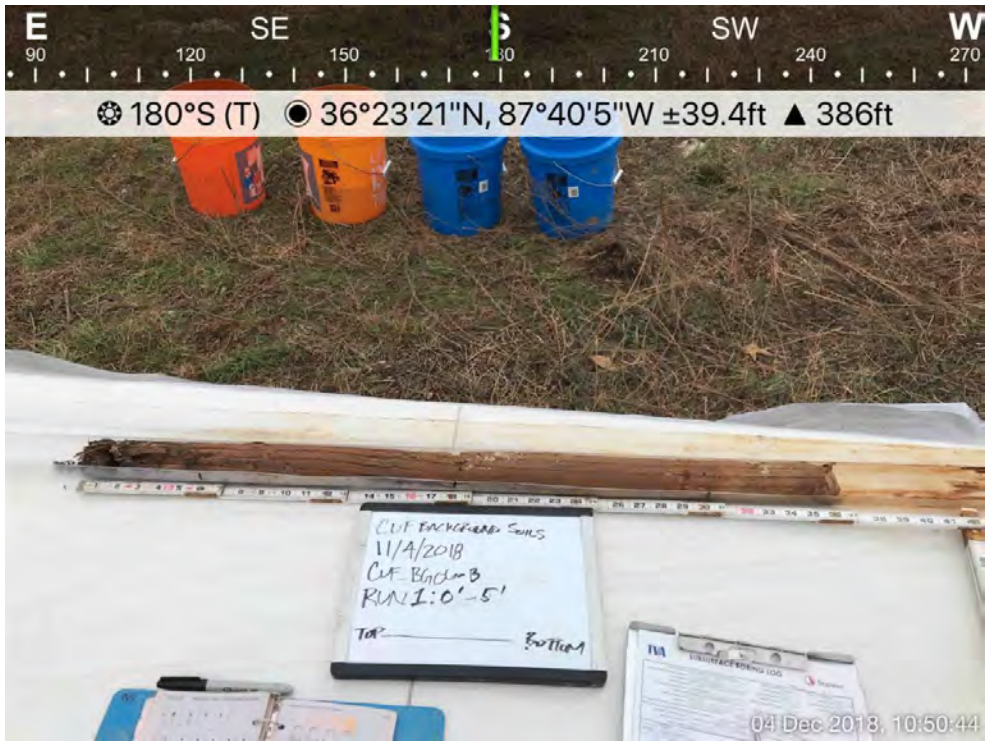
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 1 **Photo Location:** CUF-BG05 **Photo Date:** 11/29/2018 **Comments:** First boring location interval (0.0-5.0 feet).	
Photograph ID: 2 **Photo Location:** CUF-BG05 **Photo Date:** 11/29/2018 **Comments:** First boring location interval (5.0-10.0 feet).	

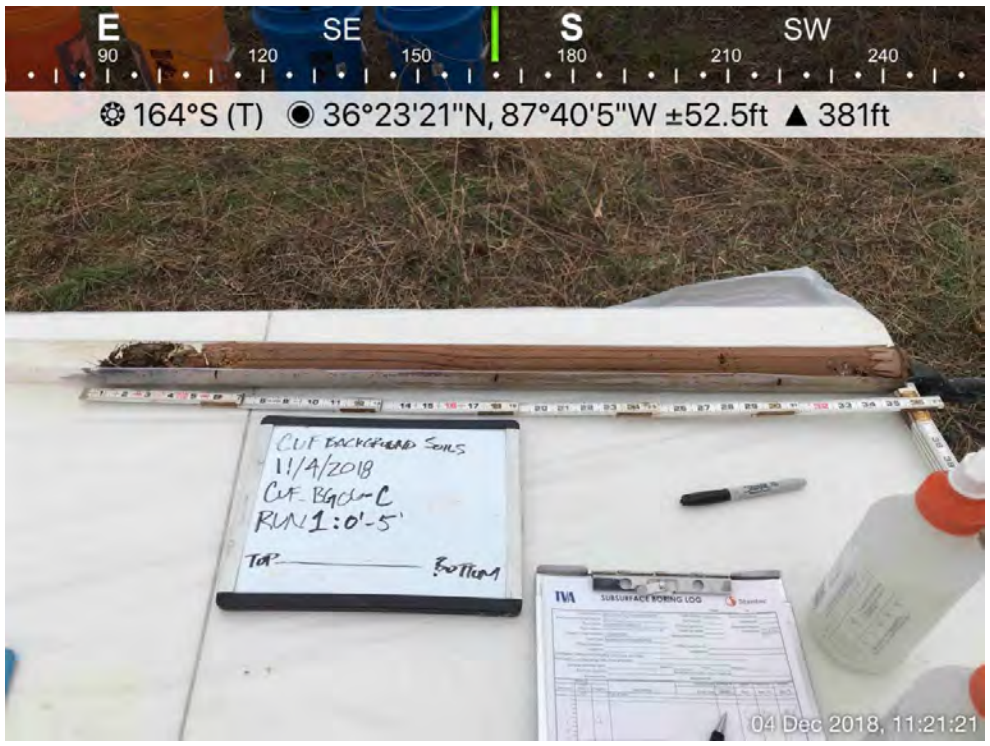
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 3 **Photo Location:** CUF-BG05 **Photo Date:** 11/29/2018 **Comments:** First boring location interval (10.0-15.0 feet).	
Photograph ID: 4 **Photo Location:** CUF-BG06 **Photo Date:** 12/4/2018 **Comments:** First boring location interval (0.0-5.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 5 **Photo Location:** CUF-BG06 **Photo Date:** 12/4/2018 **Comments:** First boring location interval (5.0-6.4 feet). Boring refusal at 6.4 feet.	
Photograph ID: 6 **Photo Location:** CUF-BG06 **Photo Date:** 12/4/2018 **Comments:** Second boring location interval (0.0-5.0 feet). Offset 20 feet to the south of the first boring.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 7 **Photo Location:** CUF-BG06 **Photo Date:** 12/4/2018 **Comments:** Second boring location interval (5.0-6.7 feet). Boring refusal at 6.7 feet.	
Photograph ID: 8 **Photo Location:** CUF-BG06 **Photo Date:** 12/4/2018 **Comments:** Third boring location interval (0.0-5.0 feet). Offset 20 feet to the southeast first boring.	

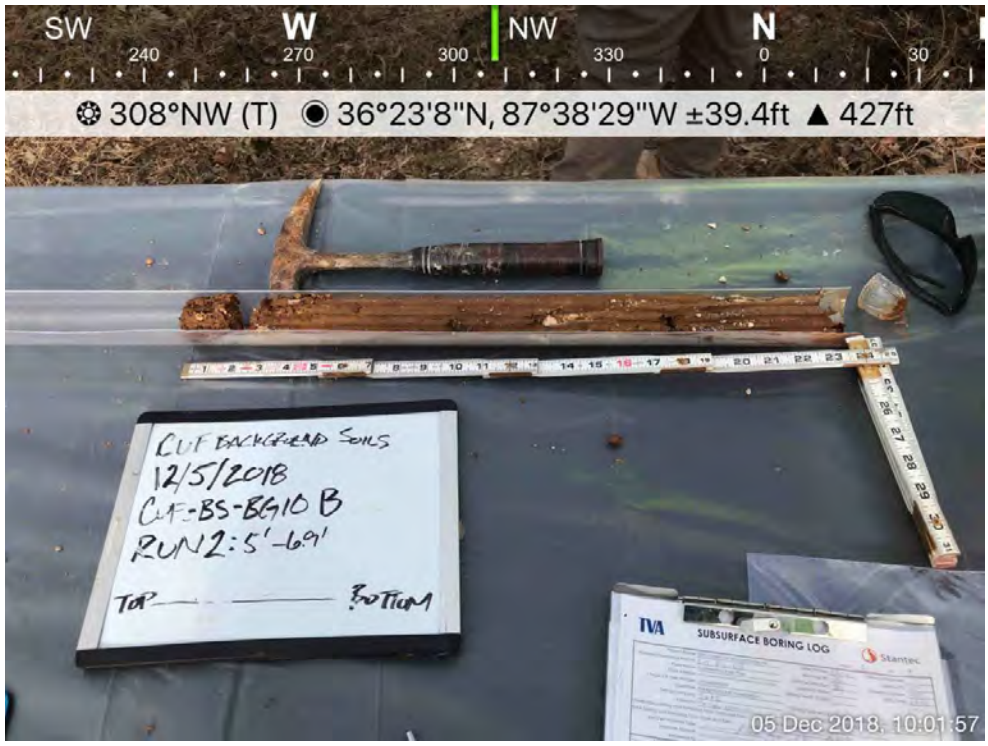
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 9 **Photo Location:** CUF-BG06 **Photo Date:** 12/4/2018 **Comments:** Third boring location interval (5.0-8.8 feet). Boring refusal at 8.8 feet.	
Photograph ID: 10 **Photo Location:** CUF-BG10 **Photo Date:** 12/5/2018 **Comments:** First boring location interval (0.0-5.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 11 **Photo Location:** CUF-BG10 **Photo Date:** 12/5/2018 **Comments:** First boring location interval (5.0-7.6 feet). Boring refusal at 7.6 feet.	
Photograph ID: 12 **Photo Location:** CUF-BG10 **Photo Date:** 12/5/2018 **Comments:** Second boring location interval (0.0-5.0 feet). Offset 14 feet to the west of the first boring.	

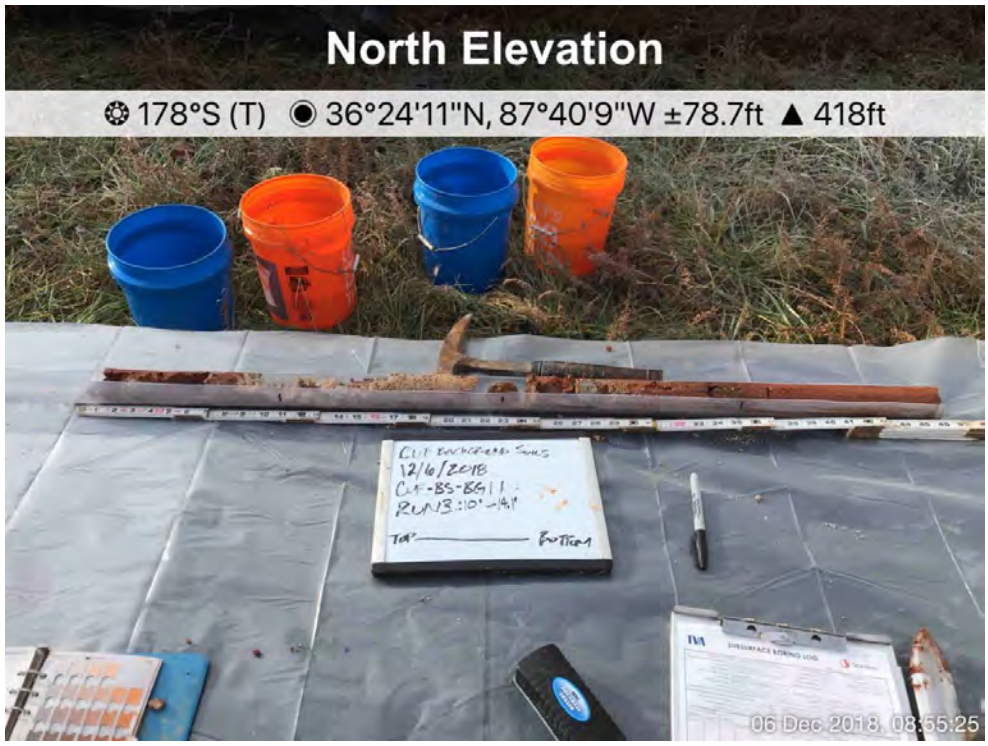
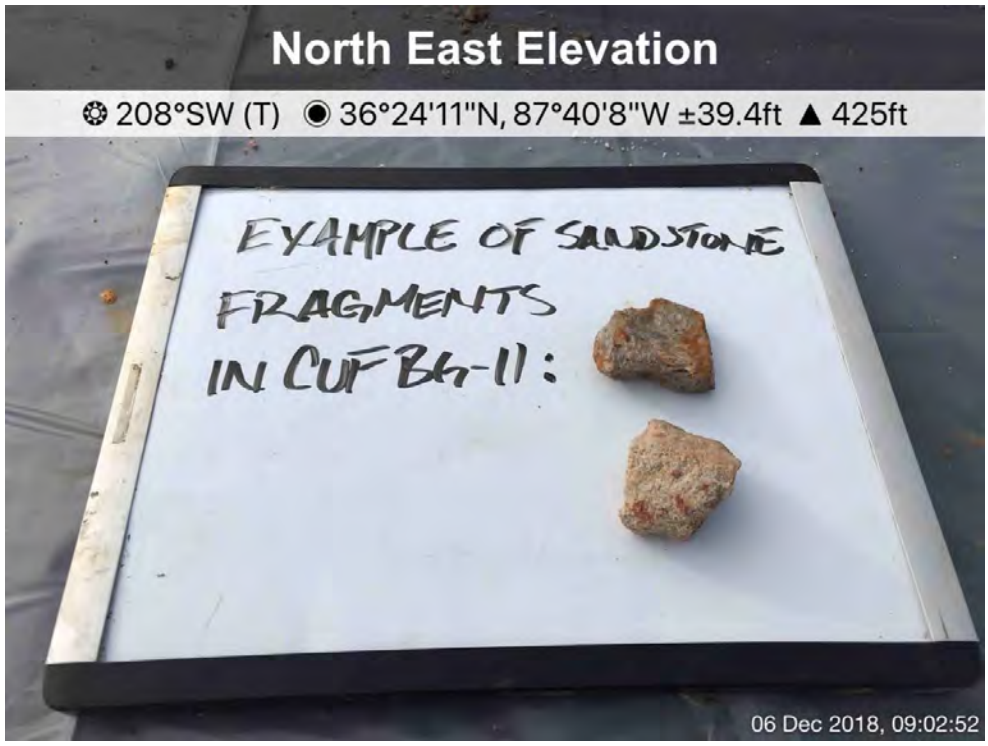
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 13 **Photo Location:** CUF-BG10 **Photo Date:** 12/5/2018 **Comments:** Second boring location interval (5.0-6.9 feet). Boring refusal at 6.9 feet.	
Photograph ID: 14 **Photo Location:** CUF-BG10 **Photo Date:** 12/5/2018 **Comments:** Third boring location interval (0.0-4.8 feet). Depth interval shown on white board should be 0.0-4.8'. Offset 18 feet to the northwest of the first boring. Boring refusal at 4.8 feet.	

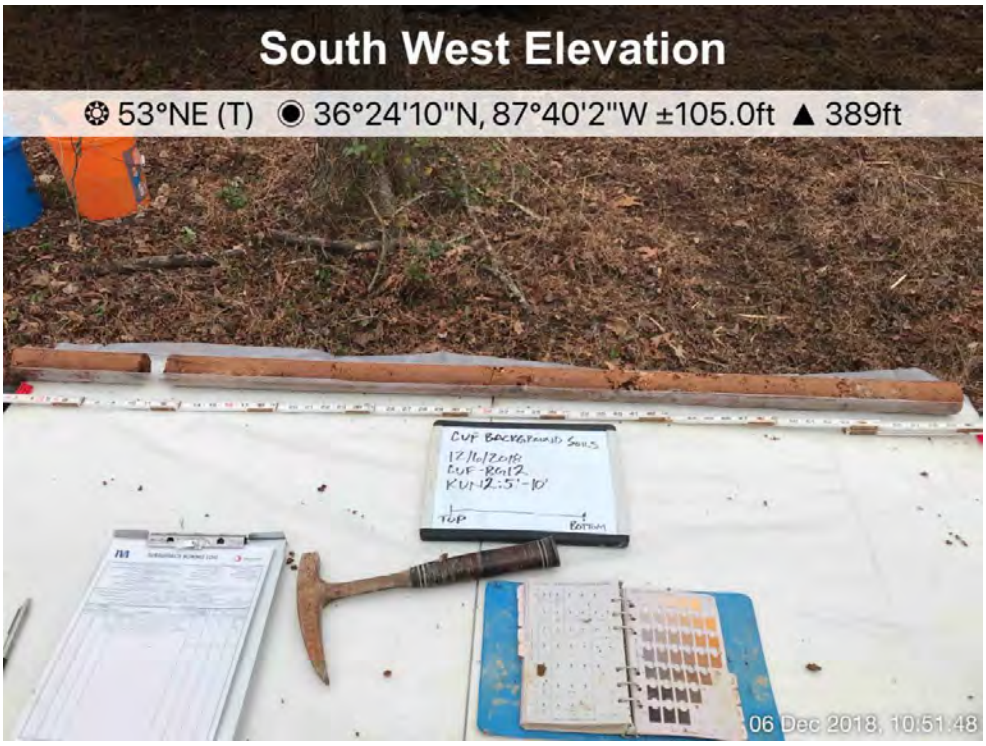
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 15 **Photo Location:** CUF-BG11 **Photo Date:** 12/6/2018 **Comments:** Interval (0.0-5.0 feet).	
Photograph ID: 16 **Photo Location:** CUF-BG11 **Photo Date:** 12/6/2018 **Comments:** Interval (5.0-10 feet).	

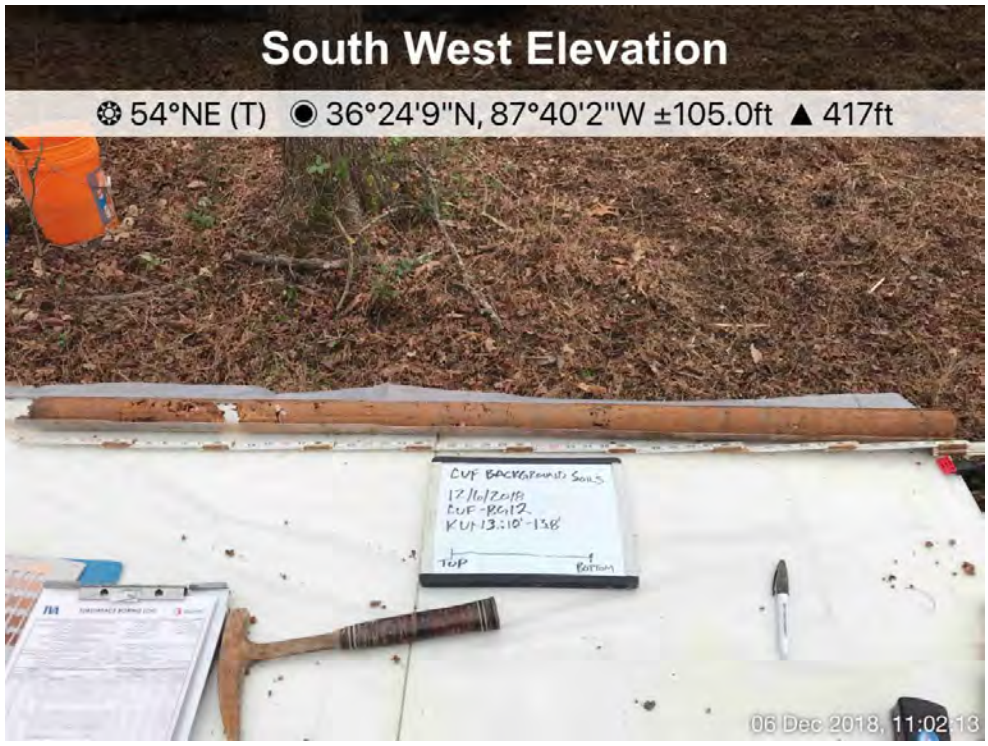
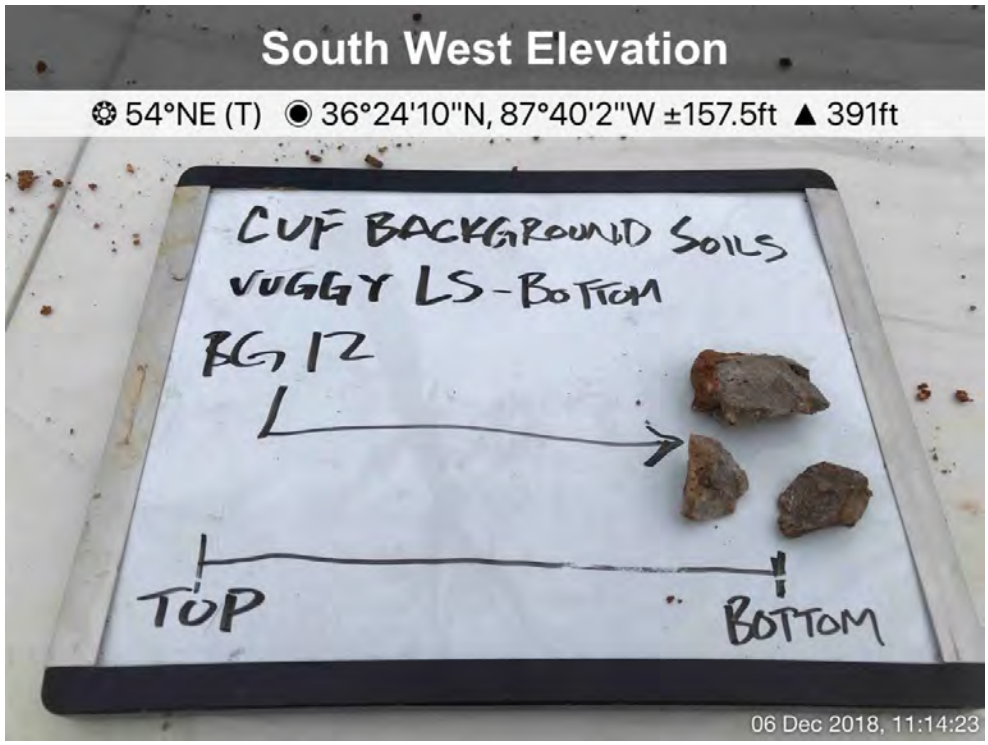
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 17 **Photo Location:** CUF-BG11 **Photo Date:** 12/6/2018 **Comments:** Interval (10.0-14.1 feet).	
Photograph ID: 18 **Photo Location:** CUF-BG11 **Photo Date:** 12/6/2018 **Comments:** Example of sandstone.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 19 **Photo Location:** CUF-BG12 **Photo Date:** 12/6/2018 **Comments:** Interval (0.0-5.0 feet).	
Photograph ID: 20 **Photo Location:** CUF-BG12 **Photo Date:** 12/6/2018 **Comments:** Interval (5.0-10.0 feet).	

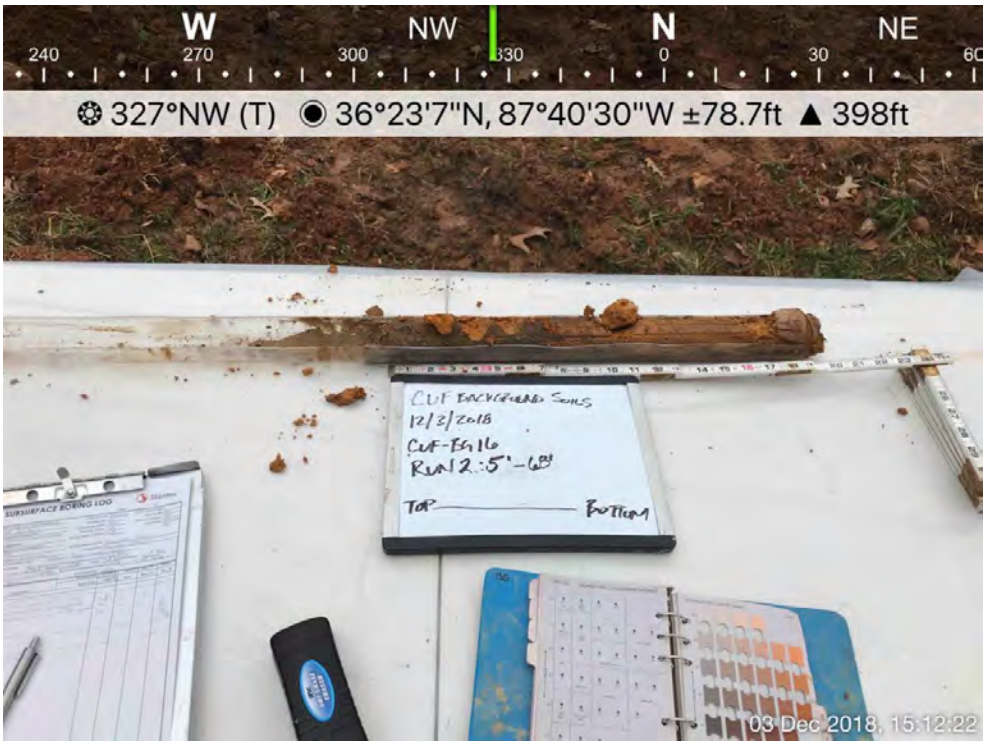
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 21 **Photo Location:** CUF-BG12 **Photo Date:** 12/6/2018 **Comments:** Interval (10.0-13.8 feet).	
Photograph ID: 22 **Photo Location:** CUF-BG12 **Photo Date:** 12/6/2018 **Comments:** Example of soil (vuggy LS)	

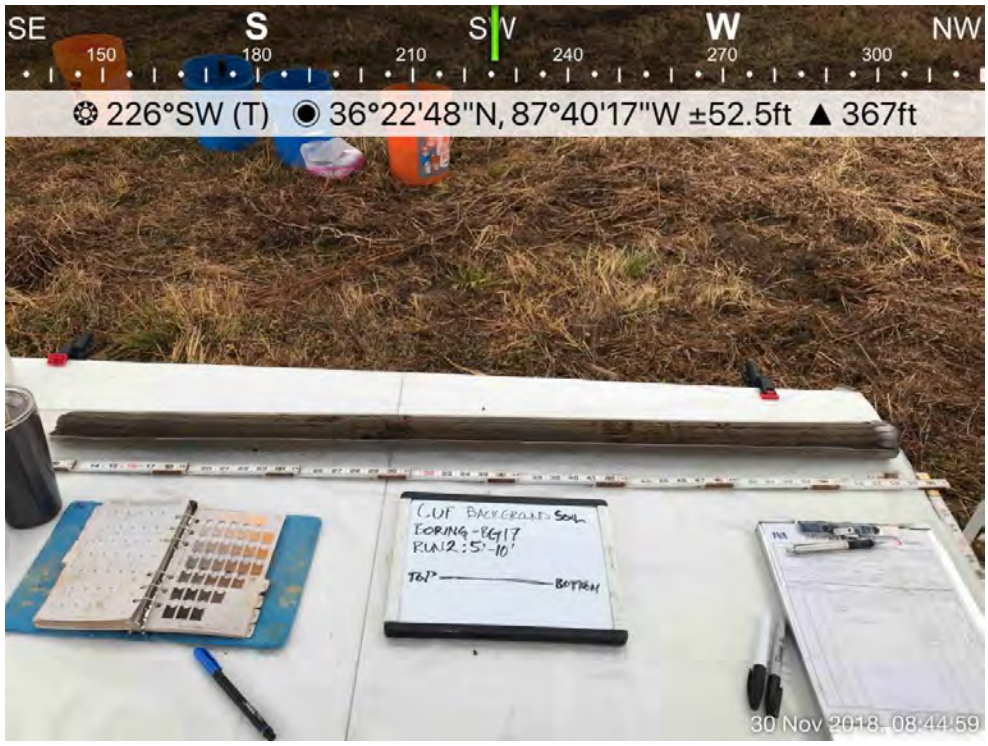
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 23 **Photo Location:** CUF-BG15 **Photo Date:** 11/29/2018 **Comments:** Interval (0.0-5.0 feet).	
Photograph ID: 24 **Photo Location:** CUF-BG15 **Photo Date:** 11/29/2018 **Comments:** Interval (5.0-9.4 feet). Depth interval shown on white board should be 5.0-9.4'.	

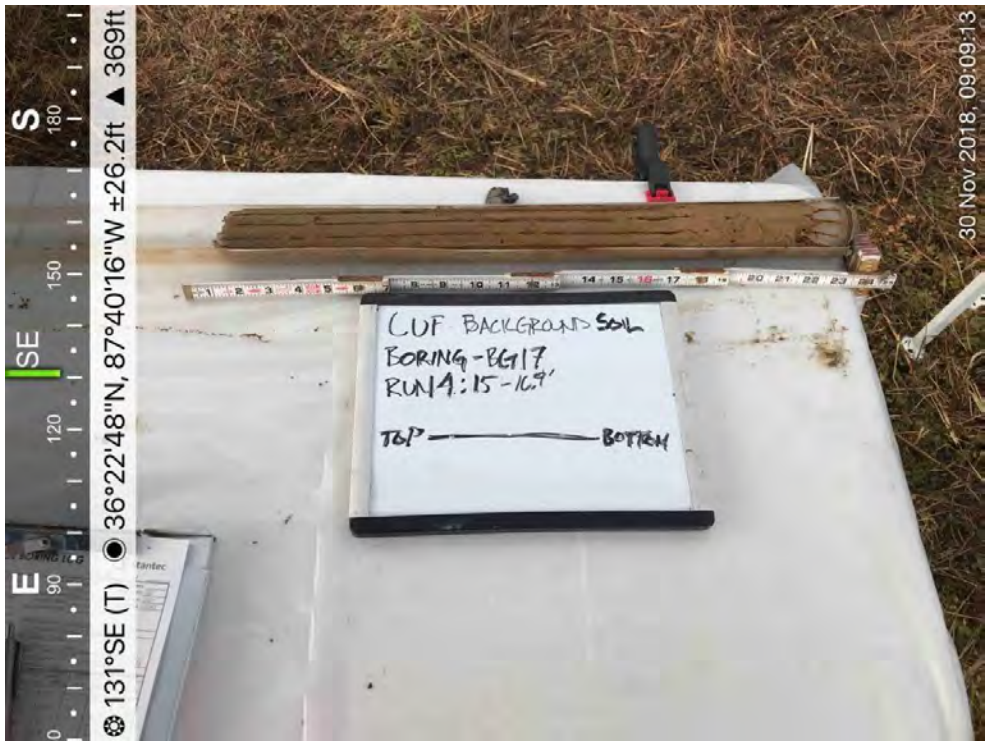
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 25 **Photo Location:** CUF-BG16 **Photo Date:** 12/3/2018 **Comments:** Interval (0.0-5.0 feet).	
Photograph ID: 26 **Photo Location:** CUF-BG16 **Photo Date:** 12/3/2018 **Comments:** Interval (5.0-6.8 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 27 **Photo Location:** CUF-BG17 **Photo Date:** 11/30/2018 **Comments:** Interval (0.0-5.0 feet).	
Photograph ID: 28 **Photo Location:** CUF-BG17 **Photo Date:** 11/30/2018 **Comments:** Interval (5.0-10.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 29 **Photo Location:** CUF-BG17 **Photo Date:** 11/30/2018 **Comments:** Interval (10.0-15.0 feet).	
Photograph ID: 30 **Photo Location:** CUF-BG17 **Photo Date:** 11/30/2018 **Comments:** Interval (15.0-16.9 feet).	

ATTACHMENT D.3

Photographic Logs of Soil Cores – Background Wells

Stantec

Photographic Log

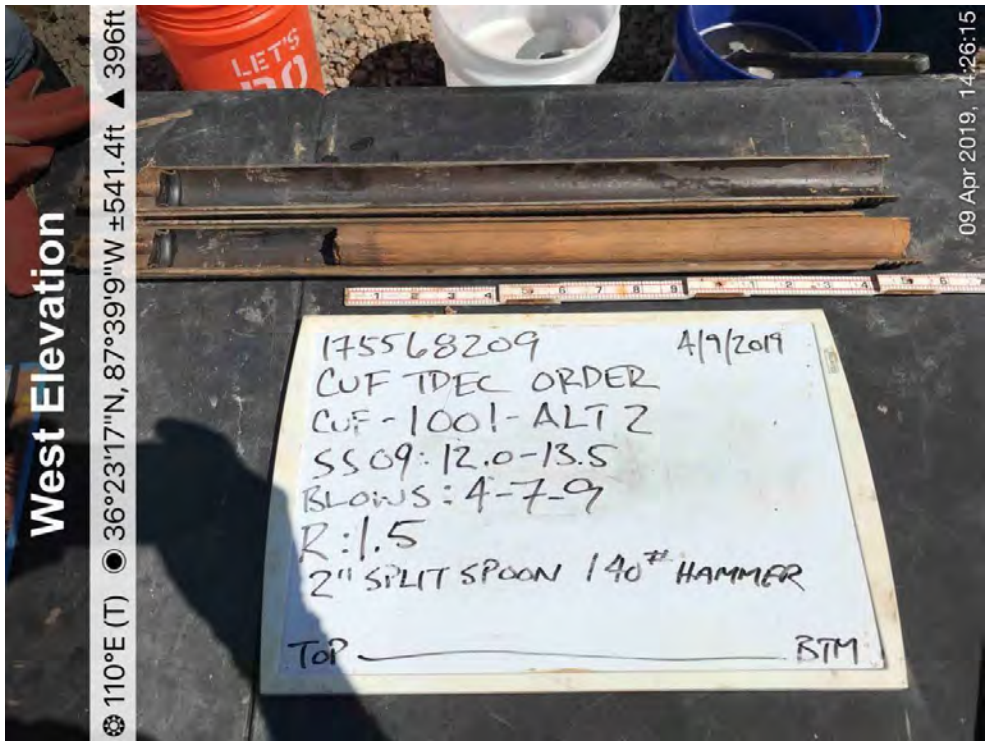
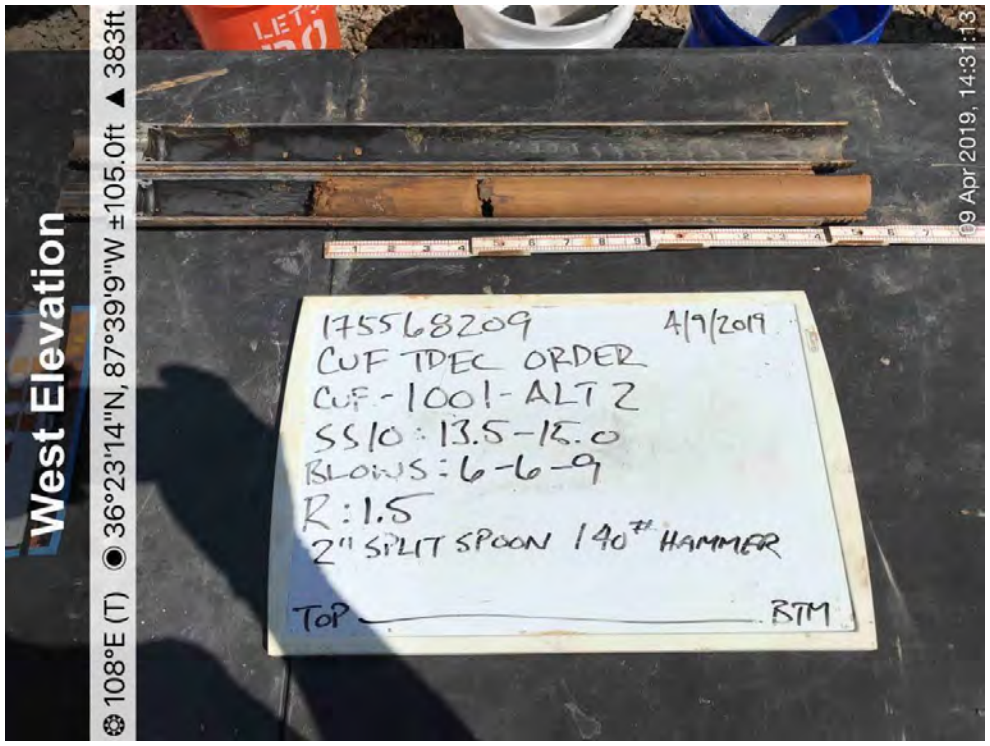
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 1 **Photo Location:** CUF-1000 **Photo Date:** 11/29/2018 **Comments:** CUF-1000ALTA Second boring location interval (13.5-15.0 feet). Offset 20 feet to the east of the first boring.	
Photograph ID: 2 **Photo Location:** CUF-1000 **Photo Date:** 11/29/2018 **Comments:** Photo of CUF-1000ALTA Second boring location interval (18.0-19.5 feet) not available.	No Photo Applicable

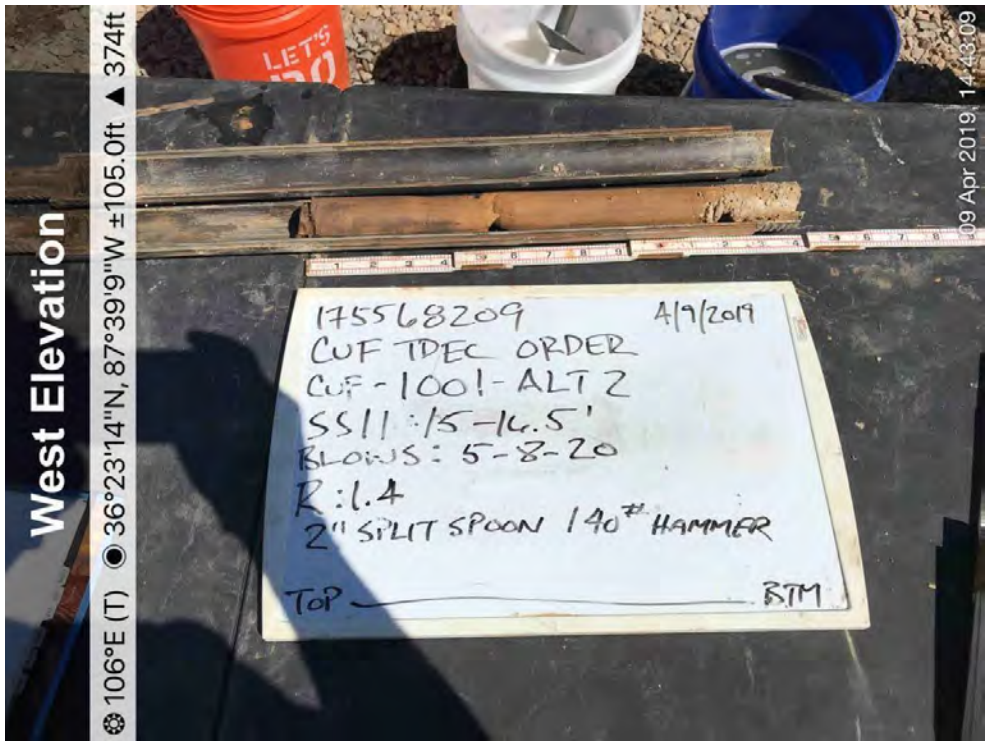
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 3 **Photo Location:** CUF-1001ALT **Photo Date:** 12/12/2018 **Comments:** Interval (13.5-15.0 feet).	
Photograph ID: 4 **Photo Location:** CUF-1001ALT **Photo Date:** 12/13/2018 **Comments:** Interval (19.5-21.0 feet). Boring abandoned.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 5 **Photo Location:** CUF-1001 (CUF-1001ALT2) **Photo Date:** 4/9/2019 **Comments:** CUF-1001ALT2 interval (12.0-13.5 feet).	
Photograph ID: 6 **Photo Location:** CUF-1001 (CUF-1001ALT2) **Photo Date:** 4/9/2019 **Comments:** CUF-1001ALT2 interval (13.5-15.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 7 **Photo Location:** CUF-1001 (CUF-1001ALT2) **Photo Date:** 4/9/2019 **Comments:** CUF-1001ALT2 interval (15.0-16.5 feet).	
Photograph ID: 8 **Photo Location:** CUF-1004 (CUF-1004ALT2A) **Photo Date:** 12/6/2018 **Comments:** Second boring location interval (12.0-13.5 feet) Offset 20 feet to the northwest of the first boring.	

Stantec

Photographic Log

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Cumberland Fossil Plant (CUF)**	**Site Location:**	**Cumberland City, Tennessee**

Photograph ID: 9

Photo Location:
CUF-1004
(CUF-1004ALT2A)

Photo Date:
12/6/2018

Comments:
Second boring location interval (16.5-18.0 feet). Boring abandoned.