APPENDIX F – BACKGROUND SOIL INVESTIGATION

APPENDIX F.1

BACKGROUND SOIL INVESTIGATION SAMPLING AND ANALYSIS REPORT

Kingston Fossil Plant
Background Soil Investigation
Sampling and Analysis Report

TDEC Commissioner's Order
Environmental Investigation Plan
Kingston Fossil Plant
Harriman, Tennessee

November 14, 2023

Prepared for:

Tennessee Valley Authority
Chattanooga, Tennessee

Prepared by:

Stantec Consulting Services Inc.
Lexington, Kentucky

Revision Record

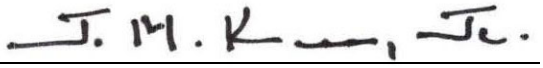
Revision	Description	Date
0	Submittal to TDEC	August 24, 2020
1	Addresses August 16, 2023 TDEC Review Comments and Issued for TDEC	November 14, 2023

Sign-off Sheet

This document entitled Kingston Fossil Plant Background Soil Investigation sampling and analysis report was prepared by Stantec Consulting Services Inc. (“Stantec”) for the account of Tennessee Valley Authority (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by 

Anna Blair, Earth Scientist

Reviewed by 

James M. Kerr, Jr., Senior Principal Geologist

Approved by 

Rebekah Brooks, Principal Hydrogeologist

Table of Contents

Abbreviations

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.
CFR	Code of Federal Regulations
COC	Chain-of-Custody
DPT	Direct Push Technology
EAR	Environmental Assessment Report
EIP	Environmental Investigation Plan
ENV	Environmental
EnvStds	Environmental Standards, Inc.
FSP	Field Sampling Personnel
ft bgs	feet below ground surface
GPS	Global Positioning System
ID	Identification
IDW	Investigation derived waste
KIF Plant	Kingston Fossil Plant
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 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 Kingston Fossil (KIF) Plant located in Harriman, Tennessee, as shown on Exhibit A.1 (Appendix A).

The purpose of the BGS investigation is to collect soil samples to evaluate the background soil conditions at the KIF 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 the BGS investigation and to present the information and data collected during the execution of the Background Soil 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 KIF 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 KIF Plant:

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

The BGS investigation was implemented in accordance with TVA- and TDEC-approved Programmatic and Project-specific changes. As approved by TDEC and described herein, soil samples were not collected for analysis of CCR-related constituents from a background well boring because a background well was not installed during implementation of the Hydrogeological Investigation SAP. This and minor variations in scope and procedures from those outlined in the Background Soil SAP and occurring during field activities due to field conditions and programmatic updates are referenced in Section 3.7.

The BGS sampling activities were completed in two field mobilization phases. Phase I field sampling activities were performed from March 11 through 28, 2019, and Phase II field sampling activities were performed on July 11, 2019. An additional sample was collected on February 25, 2020. A rock outcrop survey was also conducted on August 28 and 29, 2019.

Laboratory analysis of constituents was performed by TestAmerica Laboratories, Inc (TestAmerica) in 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 was to collect soil samples for characterization of background soils on TVA property within the vicinity of the KIF 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.

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-related constituents as described in the SAP.

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

In addition to the collection of soil samples, a rock outcrop survey was conducted. The scope of work of the survey consisted of the following tasks:

- Visually inspecting accessible rock and residuum outcrops in the vicinity of the KIF Plant to determine if naturally occurring sources of metallic ore minerals are present in the area
- Collecting rock samples with hand tools for further visual assessment where potential naturally occurring sources of metallic ore minerals were identified
- Recording sample collection locations using field GPS equipment.

3.0 FIELD ACTIVITIES

BGS investigation field activities were conducted between March 11, 2019 and February 25, 2020. A rock outcrop survey was conducted on August 28 and 29, 2019. Soil samples that were collected from the 12 background soil borings 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 and rock outcrop survey activities based on guidance and specifications listed in TVA's Environmental (ENV) Technical Instructions (TIs), the SAP, 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 certain 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, on behalf of TDEC, Civil and Environmental Consultants, Inc. (CEC) collected split soil samples at one boring location (KIF-BG11). 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 boring locations proposed in the SAP using the GPS
- Collected GPS measurements at the boring locations
- Collected soil samples from 12 BGS boring locations
- Recorded field measurements of soil pH at the 12 sampled boring locations
- Collected quality control (QC) samples, including four matrix spike/matrix spike duplicates, five field duplicates, 12 field blanks, three equipment blanks and two liner blanks
- Conveyed collected samples via laboratory-provided courier service or Federal Express Shipment to TestAmerica and via Federal Express shipment to RJ Lee for analysis
- Visually inspected six rock outcrop areas
- Collected ten rock outcrop samples for further visual assessment.

Details on each activity are presented in the sections below.

3.1 WORK LOCATIONS

The BGS investigation field activities were conducted at 12 BGS boring and six rock outcrop locations near the KIF Plant under the BGS investigation scope of work. The BGS investigation boring locations and rock outcrop survey areas are shown on Exhibits A.2 and A.3 (Appendix A), respectively. A list of the BGS investigation borings and associated soil samples is included in Table B.1 (Appendix B).

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) using a hand auger. Along with surficial samples, the Field Sampling Personnel (FSP) 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 swelling soils occurred within the sample liners in excess of the planned five-foot run, a 2.5-foot run was used instead. When this occurred, the two-foot sample interval was collected proportionally from the bottom of the first 2.5-foot run and the top of the second 2.5-ft run representing the originally planned five-foot run interval. Samples were collected from multiple soil depths to provide data for vertical characterization of background soils.

3.1.2 Rock Outcrops

The rock outcrops were visually inspected for the presence of naturally occurring ore-related minerals. Visual inspections included removing weathered surficial rock or residuum (if necessary, to identify any ore-related minerals that might be present) and photographing the outcrops. Representative samples were generally collected directly from the outcrops using hand tools and retained for further visual assessment to inform a written description of the sample and sample analysis, as necessary. In areas where the outcrop consisted primarily of residuum and/or where outcrops had been anticipated to exist but were not found during the outcrop survey field work, grab samples were collected from float (i.e., pieces of rock that have been separated from nearby bedrock outcrops) present in those areas for further description. Outcrop strike and dip measurements were taken using a Brunton® Pocket Transit. The rock sample locations were recorded using field GPS equipment (Trimble® R1 unit).

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 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 FSP recorded daily field activities, observations, and data on a *Daily Field Activity Log* to chronologically document the field program. Deviations from the SAP 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, 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 FSP recorded daily soil pH meter calibrations on a *Soil pH Calibration and Inspection Log* for each day that soil pH measurements were taken. 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 FSP 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 Form

Stantec FSP completed *COC* documentation for each soil and outcrop sample collected for laboratory analysis during the BGS investigation. The sample ID, sample location, sample depth (if applicable), type of sample, sampling date and time, analyses requested, and sample custody record were recorded on the *COCs*. The Field Team Leader reviewed the *COCs* for completeness, and the FSP conducted a QC check of samples in each cooler compared to sample IDs on the corresponding *COC* 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 SAP, QAPP, and Stantec Standard Operating Procedure -REV 1 for measurement of soil pH for the ExTech ExStik 110 meter (Stantec 2018c). 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 and rock outcrop survey areas were taken during the BGS investigation. Photographic logs of BGS subsurface soil cores and the rock outcrop areas are provided in Attachments D.1 and D.2, respectively, in Appendix D.

3.3 SOIL BORINGS AND SAMPLING

3.3.1 Soil Borings

The BGS investigation borings were advanced by Hawkston Drilling, LLC, under Stantec oversight, using a DPT rig equipped with a 3.75-inch dual tube tooling system. The BGS investigation borings were advanced in two phases: Phase I - March 11 through 28, 2019, and Phase II - July 11, 2019. On February 25, 2020, a single sample was collected by hand auger. The boring locations are shown on Exhibit A.2. The two mobilizations were necessary to complete the defined scope of work.

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

- KIF-BG07 – On March 12, 2019, the DPT rig mobilized to location KIF-BG07. The DPT rig advanced one soil boring at this location. Refusal was encountered at 53.5 ft bgs. The boring was logged and sampled as KIF-BG07.
- KIF-BG03 – On March 13, 2019, the DPT rig mobilized to location KIF-BG03. The DPT rig advanced two soil borings at this location. Refusal was encountered at 14.1 ft bgs (first boring), and at 15.0 ft bgs (second boring). The first boring, drilled to 14.1 ft bgs, was logged and sampled as KIF-BG03. Samples from the deepest boring, drilled to 15.0 ft bgs, were not logged and sampled because they did not reach a significantly greater depth to allow for an additional sampling interval.
- KIF-BG02 – The original location of KIF-BG02 was within an area without required environmental reviews and was relocated with TDEC approval. On March 14, 2019, the DPT rig mobilized to location KIF-BG02. The DPT rig advanced three soil borings at this location. Refusal was encountered at 9.5 ft bgs (first boring), 9.5 ft bgs (second boring), and 15.5 ft bgs (third boring). The deepest boring, drilled to 15.5 ft bgs, was logged and sampled as KIF-BG02.
- KIF-BG05 – On March 18, 2019, the DPT rig mobilized to location KIF-BG05. The DPT rig advanced one boring at this location. Refusal was encountered at 29.3 ft bgs. The boring was logged and sampled as KIF-BG05.
- KIF-BG04 – On March 19, 2019, the DPT rig mobilized to location KIF-BG04. The DPT rig advanced three soil borings at this location. Refusal was encountered at 7.6 ft bgs (first boring), 11.1 ft bgs (second boring), and 8.0 ft bgs (third boring). The deepest boring, drilled to 11.1 ft bgs, was logged and sampled as KIF-BG04.

- KIF-BG11 – On March 21, 2019, the DPT rig mobilized to location KIF-BG11. The DPT rig advanced three soil borings at this location. Refusal was encountered at 15.0 ft bgs (first boring), 10.0 ft bgs (second boring), and 40.4 ft bgs (third boring). The deepest boring, drilled to 40.4 ft bgs, was logged and sampled as KIF-BG11.

  CEC collected split samples from 6.5 to 8.5 ft bgs, 16.5 to 18.5 ft bgs, and 26.5 to 28.5 ft bgs at KIF-BG11.

- KIF-BG10 – The original location of KIF-BG10 was moved with TDEC approval because of access restrictions. On March 25, 2019, the DPT rig mobilized to location BG10. The DPT rig advanced one soil boring at this location. Refusal was encountered at 22.2 ft bgs. The boring was logged and sampled as KIF-BG10.

- KIF-BG08 – On March 26, 2019, the DPT rig mobilized to location KIF-BG08. The DPT rig advanced one soil boring at this location. Refusal was encountered at 27.5 ft bgs. The boring was logged and sampled as KIF-BG08.

- KIF-BG09 – On March 26, 2019, the DPT rig mobilized to location KIF-BG09. The DPT rig advanced one soil boring at this location. Refusal was encountered at 31.8 ft bgs. The boring was logged and sampled as KIF-BG09.

- KIF-BG12 – March 27, 2019, the DPT rig mobilized to location KIF-BG12. The DPT rig advanced one soil boring at this location. Refusal was encountered at 37.0 ft bgs. The boring was logged and sampled as KIF-BG12.

- KIF-BG01 – On March 28, 2019, the DPT rig mobilized to location KIF-BG01. The DPT rig advanced three soil borings at this location. Refusal was encountered at 8.0 ft bgs (first boring), 5.1 ft bgs (second boring), and 6.9 ft bgs (third boring). The deepest boring, drilled to 8.0 ft bgs, was logged and sampled as KIF-BG01.

- KIF-BG06 – During the Phase I mobilization, the boring at KIF-BG06 encountered CCR material in the first soil sampling interval (0 – 5 ft bgs). Following TDEC approval, a revised boring location for KIF-BG06 was drilled on July 11, 2019, during the Phase II mobilization. The DPT rig advanced one soil boring at this location. Refusal was encountered at 9.5 ft bgs. The boring was logged and sampled as KIF-BG06. As described in Section 3.7.2., an additional sample was collected with a hand auger approximately 10 feet north of boring KIF-BG06 for polarized light microscopy (PLM) analysis on February 25, 2020. This sample location is noted as KIF-BG06A.

Following sample collection, as 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

During advancement of each boring, a Tennessee-licensed PG prepared field subsurface logs using the *Subsurface Log* form. Each form includes a description of subsurface lithology, sample recovery, color using the Munsell Soil Color Charts and other relevant parameters as required by the SAP and TIs. As part of the logging process, soil cores were photographed by the FSP with interval data documented on a white board. Analytical and duplicate 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, except as otherwise noted in the Variations section. The collected soil was placed in clean, resealable plastic bags and homogenized using gloved hands and when necessary clean, unused, disposable, or decontaminated sampling tools. Decontamination of sampling equipment was conducted in accordance with TVA, ENV-TI-05.80.05, *Field Sampling Equipment Cleaning and Decontamination*. 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 Standard Operating Procedure – REV 1. The measurements were recorded on the *Soil pH Data Form* within 15 minutes after creating the soil paste.

Afterwards, the sample was placed in an appropriate laboratory-supplied sample container. 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*. FSP 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 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 PLM.

3.4 ROCK OUTCROP SURVEY

The rock outcrop survey was conducted from August 28 to August 29, 2019. The survey areas are shown on Exhibit A.3. As part of the survey process, rock outcrops were photographed by the FSP with area name, and strike and dip documented on a white board. Additional photographs of individual rock specimens were taken using both 0X and 15X magnification to record visible information about the mineralogy. A photographic log for the rock outcrop survey is provided in Appendix D.2.

The survey was completed in the following chronological sequence:

- Area 03 – On August 28, 2019, the survey team mobilized to location Area 03. Two rock samples were collected from the outcrops (KIF-ROC-AREA03-01 and KIF-ROC-AREA03-02).
- Area 06 – On August 28, 2019, the survey team mobilized to location Area 06. One rock sample was collected from the outcrops (KIF-ROC-AREA06-01).
- Area 01 – On August 29, 2019, the survey team mobilized to location Area 01. Three rock samples were collected from the outcrops (KIF-ROC-AREA01-01, KIF-ROC-AREA01-02, and KIF-ROC-AREA01-03).
- Area 02 – On August 29, 2019, the survey team mobilized to location Area 02. One rock sample was collected from the outcrops (KIF-ROC-AREA02-01).
- Area 04 – On August 29, 2019, the survey team mobilized to location Area 04. One grab sample of float was collected (KIF-ROC-AREA04-G1).
- Area 05 – On August 29, 2019, the survey team mobilized to location Area 05. Two rock samples were collected from the outcrops (KIF-ROC-AREA05-01 and KIF-ROC-AREA05-02) and one grab sample of float was collected (KIF-ROC-AREA05-G1).

3.5 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 dispersed to the ground surface as authorized by TVA KIF 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 KIF Plant-specific waste management plan, and local, state, and federal regulations. Transportation and disposal of IDW was coordinated with TVA KIF Plant personnel.

3.6 SAMPLE SHIPMENT

Soil 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 shipped to TestAmerica in St. Louis, Missouri (radium analysis only) and delivered via courier to TestAmerica in Nashville, Tennessee and then subsequently shipped to TestAmerica in Pittsburgh, Pennsylvania (all other analyses). The samples to be analyzed by PLM (percent ash) were shipped to RJ Lee located in Monroeville, Pennsylvania. TestAmerica submitted sample receipt forms to EnvStds to document the condition in which the samples were received. Rock outcrop samples collected were transported by Stantec field personnel to the Lexington, Kentucky, Stantec office for additional visual inspection and photo documentation.

3.7 VARIATIONS

The proposed scope and procedures for the BGS investigation were outlined in the SAP, QAPP, and applicable TVA TIs, 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 SAP are described in the following sections. As discussed below, these variations do not impact the overall usability and representativeness of the data provided in this SAR for the BGS investigation at the KIF Plant.

3.7.1 Variations in Scope

Variations in scope are provided below.

- Soil samples were not collected within the screened interval of proposed background monitoring well KIF-102 because 11 borings in the exploration area for this location did not encounter groundwater, and the well was not installed. This change was approved by TDEC.
- Background soil boring KIF-BG02 was relocated as approved by TDEC because it was originally located in an area lacking required environmental surveys.
- Background soil boring KIF-BG06 was relocated as approved by TDEC because CCR material was encountered within the surficial sample.
- Background soil boring KIF-BG10 was relocated as approved by TDEC because of access restrictions.

3.7.2 Variations in Procedures

Variations in procedures occurring in the field are provided below.

- Soil cores were collected in 2.5-foot intervals instead of 5.0-foot intervals as specified in the SAP during boring advancement from the ground surface to the top of bedrock/partially weathered rock/weathered rock (refusal) at borings KIF-BG08, KIF-BG10, KIF-BG11, and KIF-BG12 to allow

for swelling soils. The soil cores were collected continuously; therefore, there were no gaps in record due to the change in core intervals.

- The soil sample collected for PLM analysis at boring KIF-BG06 was collected by hand auger on a different day and at an offset location (approximately 10 feet to the north) than the samples collected at the original boring. The sample collected for the PLM analysis is considered to be representative of the original boring location.
- The frequency of field QC sample collection did not meet the specific QAPP and SAP requirements. The results of the collected field QC samples were evaluated as part of the data validation/verification process performed by EnvStds.

4.0 SUMMARY

The data presented in this report are from the BGS investigation at the KIF Plant. The BGS investigation included collecting soil analytical samples to assess CCR Parameters and percent ash. A total of 80 soil samples, including five duplicate samples, were collected from the 12 BGS borings (KIF-BG01 through KIF-BG12) 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 list of samples collected, along with duplicates, is presented in Table B.1. 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.

Additionally, a rock outcrop survey was conducted near the KIF Plant to determine if naturally occurring sources of metallic ore minerals are present in the area. Six rock outcrop areas were documented and sampled.

Stantec has completed the BGS investigation at the KIF Plant in Harriman, Tennessee, in accordance with the Background Soil SAP 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

Environmental Standards, Inc. 2018. *Quality Assurance Project Plan for the Tennessee Valley Authority Kingston Fossil Plant Environmental Investigation*. Prepared for Tennessee Valley Authority. Revision 3. November 2018.

Munsell Color. 2009. Munsell Soil Color Book.

Stantec Consulting Services Inc. (Stantec). 2018a. *Background Soil Sampling and Analysis Plan, Kingston Fossil Plant.* Revision 4. Prepared for Tennessee Valley Authority. November 9, 2018.

Stantec. 2018b. *Environmental Investigation Plan, Kingston Fossil Plant.* Revision 4. Prepared for Tennessee Valley Authority. November 9, 2018.

Stantec. 2018c. Standard Operating Procedures - REV 1 for the ExTech ExStik 110 meter. September 5, 2018.

Tennessee Department of Environment and Conservation (TDEC). *Commissioner's Order No. OGC15-0177.* August 6, 2015.

Tennessee Valley Authority (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

Client/Project

Tennessee Valley Authority
Kingston Fossil Plant (KIF) TDEC Order

Project Location

Roane County, Tennessee

175668043
Prepared by MB on 2020-05-19
Technical Review by AB on 2020-05-19

0 1,000 2,000 3,000 4,000 Feet

1:12,000 (At original document size of 22x34)

Legend

- CCR Unit Area (Approximate)
- Engineered Wetlands (Approximate)
- Polishing Pond (Approximate)

Notes

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Topographic mapping corresponds to the Harriman Quadrangle (Edition of 2019, Scale 1:24,000) and the Elverton Quadrangle (Edition of 2019, Scale 1:24,000)

Stantec TVA

Exhibit No.

A.2

Title

Background Soil Boring Location Map

Client/Project

Tennessee Valley Authority
Kingston Fossil Plant (KIF) TDEC Order

Project Location

Roane County, Tennessee

175668043

Prepared by MB on 2020-05-19
Technical Review by AB on 2020-05-19

0 800 1,600 2,400 3,200 Feet

1:9,600 (At original document size of 22x34)

Legend

- Background Soil Boring
- 2017 Imagery Boundary
- 2018 Imagery Boundary
- CCR Unit Area (Approximate)
- Engineered Wetlands (Approximate)
- Polishing Pond (Approximate)

N

Notes

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Imagery provided by TVA and flown by Tuck Mapping on March 16, 2017; 2018 Imagery provided by TVA and is dated September 12, 2018 and ESRI World Imagery

Stantec TVA

Exhibit No.

A.3

Title

Rock Outcrop Survey Area

Client/Project

Tennessee Valley Authority
Kingston Fossil Plant (KIF) TDEC Order

Project Location

Roane County, Tennessee

175668043
Prepared by DMB on 2020-07-29
Technical Review by EM on 2020-07-29

0 400 800 1,200 1,600 Feet

1:4,800 (At original document size of 22x34)

Legend

- Rock Sample
- Rock Outcrop Survey Area
- 2018 Imagery Boundary
- 2019 Imagery Boundary
- KIF Study Area Boundary
- TVA Property Boundary (Approximate)
- CCR Unit Area (Approximate)
- Engineered Wetlands Area (Approximate)

Notes

1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. Imagery provided by TVA and flown by Tuck Mapping on March 16, 2017; 2018 and 2019 Imagery provided by TVA and are dated September 12, 2018 and March 7, 2019

Stantec TVA

APPENDIX B - TABLES

TABLE B.1 – Summary of Background Soil Samples
Kingston Fossil Plant
March 2019 - February 2020

			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
KIF-BG01	KIF-BS-BG01-0.0/0.5-20190328	Normal Environmental Sample	x	x	x	x	x	x	x
	KIF-BS-BG01-1.5/3.5-20190328	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG01-6.0/8.0-20190328	Normal Environmental Sample		x	x	x	x	x	x
KIF-BG02	KIF-BS-BG02-0.0/0.5-20190314	Normal Environmental Sample	x	x	x	x	x	x	x
	KIF-BS-BG02-0.7/2.7-20190314	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG02-6.5/8.5-20190314	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG02-11.0/14.0-20190314	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-DUP01-20190314	Field Duplicate Sample		x	x	x	x		x
KIF-BG03	KIF-BS-BG03-0.0/0.5-20190313	Normal Environmental Sample	x	x	x	x	x	x	x
	KIF-BS-BG03-1.5/3.5-20190313	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG03-6.5/8.5-20190313	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG03-11.5/13.5-20190313	Normal Environmental Sample		x	x	x	x	x	x
KIF-BG04	KIF-BS-BG04-0.0/0.5-20190319	Normal Environmental Sample	x	x	x	x	x	x	x
	KIF-BS-BG04-0.0/1.9-20190319	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG04-5.0/7.7-20190319	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG04-10.0/11.1-20190319	Normal Environmental Sample		x	x	x	x	x	x
KIF-BG05	KIF-BS-BG05-0.0/0.5-20190318	Normal Environmental Sample	x	x	x	x	x	x	x
	KIF-BS-BG05-6.5/8.5-20190318	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG05-11.5/13.5-20190318	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG05-16.5/18.5-20190318	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG05-21.0/24.0-20190318	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG05-26.5/28.5-20190318	Normal Environmental Sample		x	x	x	x	x	x
KIF-BG06	KIF-BS-BG06A-0.0/0.5-20200225	Normal Environmental Sample	x						
	KIF-BS-DUP01-20200225	Field Duplicate Sample	x						
	KIF-BS-BG06-0.0/0.5-20190711	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-DUP01-20190711	Field Duplicate Sample		x	x	x	x		x
	KIF-BS-BG06-1.5/3.5-20190711	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG06-6.0/8.0-20190711	Normal Environmental Sample		x	x	x	x	x	x
KIF-BG07	KIF-BS-BG07-0.0/0.5-20190312	Normal Environmental Sample	x	x	x	x	x	x	x
	KIF-BS-BG07-1.5/3.5-20190312	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG07-6.5/8.5-20190312	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG07-11.5/13.5-20190312	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG07-16.5/18.5-20190312	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG07-21.5/23.5-20190312	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG07-26.5/28.5-20190312	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG07-31.5/33.5-20190312	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG07-36.5/38.5-20190312	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG07-41.5/43.5-20190312	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG07-46.5/48.5-20190312	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG07-51.5/53.5-20190312	Normal Environmental Sample		x	x	x	x	x	x
KIF-BG08	KIF-BS-BG08-0.0/0.5-20190326	Normal Environmental Sample	x	x	x	x	x	x	x
	KIF-BS-BG08-1.5/3.5-20190326	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG08-6.5/8.5-20190326	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG08-11.5/13.5-20190326	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG08-16.5/18.5-20190326	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG08-21.5/23.5-20190326	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG08-26.5/27.5-20190326	Normal Environmental Sample		x	x	x	x	x	x
KIF-BG09	KIF-BS-BG09-0.0/0.5-20190326	Normal Environmental Sample	x	x	x	x	x	x	x
	KIF-BS-DUP03-20190326	Field Duplicate Sample	x	x	x	x	x		x
	KIF-BS-BG09-1.5/3.5-20190326	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG09-6.5/8.5-20190326	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG09-11.5/13.5-20190326	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG09-16.5/18.5-20190326	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG09-21.5/23.5-20190326	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG09-26.5/28.5-20190326	Normal Environmental Sample		x	x	x	x	x	x

TABLE B.1 – Summary of Background Soil Samples
Kingston Fossil Plant
March 2019 - February 2020

			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
KIF-BG10	KIF-BS-BG10-0.0/0.5-20190325	Normal Environmental Sample	x	x	x	x	x	x	x
	KIF-BS-BG10-0.0/2.2-20190325	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG10-6.5/8.5-20190325	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG10-11.5/13.5-20190325	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG10-16.5/18.5-20190325	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG10-20.0/22.2-20190325	Normal Environmental Sample		x	x	x	x	x	x
KIF-BG11	KIF-BS-BG11-0.0/0.5-20190322	Normal Environmental Sample	x	x	x	x	x	x	x
	KIF-BS-BG11-1.5/3.5-20190321	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG11-6.5/8.5-20190321	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG11-11.5/13.5-20190321	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG11-16.5/18.5-20190321	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG11-21.5/23.5-20190321	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-DUP02-20190321	Field Duplicate Sample		x	x	x	x		x
	KIF-BS-BG11-26.5/28.5-20190321	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG11-31.5/33.5-20190322	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG11-36.5/38.5-20190322	Normal Environmental Sample		x	x	x	x	x	x
KIF-BG12	KIF-BS-BG12-0.0/0.5-20190327	Normal Environmental Sample	x	x	x	x	x	x	x
	KIF-BS-BG12-1.5/3.5-20190327	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG12-6.5/8.5-20190327	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG12-11.5/13.5-20190327	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG12-16.5/18.5-20190327	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG12-21.5/23.5-20190327	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG12-26.5/28.5-20190327	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG12-31.5/33.5-20190327	Normal Environmental Sample		x	x	x	x	x	x
	KIF-BS-BG12-35.0/37.0-20190327	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.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG01			KIF-BG02			
Sample Date		28-Mar-19	28-Mar-19	28-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19
Sample ID		KIF-BS-BG01-0.0/0.5-20190328	KIF-BS-BG01-1.5/3.5-20190328	KIF-BS-BG01-6.0/8.0-20190328	KIF-BS-BG02-0.0/0.5-20190314	KIF-BS-BG02-0.7/2.7-20190314	KIF-BS-BG02-6.5/8.5-20190314	KIF-BS-BG02-11.0/14.0-20190314
Sample Depth		0 - 0.5 ft	1.5 - 3.5 ft	6 - 8 ft	0 - 0.5 ft	0.7 - 2.7 ft	6.5 - 8.5 ft	11 - 14 ft
Sample Type		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
	Units							
PLM								
% ASH	%	3	-	-	4	-	-	-
Total Metals								
Antimony	mg/kg	0.0868 J	0.165 J	<0.0721	0.218 J	0.138 J	<0.0751	<0.0719
Arsenic	mg/kg	2.42	5.25	1.59	5.71	4.59	3.84	3.06
Barium	mg/kg	80.3	107	151	83.6	143	81.9	130
Beryllium	mg/kg	0.870	0.654	0.966	0.573	0.557	0.576	1.35
Boron	mg/kg	2.67 J	2.55 J	4.63 J	3.52 J	2.47 J	2.30 J	3.20 J
Cadmium	mg/kg	0.0621 J	0.0474 J	<0.0198	0.0818 J	<0.0201	<0.0206	<0.0197
Calcium	mg/kg	1,450	2,280	2,530	3,030	621	35.6 J	587
Chromium	mg/kg	22.3	19.3	30.2	14.9	21.2	19.4	30.5
Cobalt	mg/kg	13.2	28.1	14.4	9.03	7.71	7.37	16.5
Copper	mg/kg	12.4	9.53	21.0	9.92	11.9	9.90	19.0
Lead	mg/kg	14.1	17.1	7.99	17.9	25.4	10.5	9.74
Lithium	mg/kg	14.9	11.0	28.5	7.12	12.4	12.8	26.4
Mercury	mg/kg	0.0420	0.0439	<0.0155	0.0562 U*	0.0483 U*	0.0310 U*	<0.0162
Molybdenum	mg/kg	0.284 J	0.691	<0.190	0.886	0.688	0.312 J	<0.189
Nickel	mg/kg	16.9	11.6	33.3	8.85	10.8	9.36	33.3
Selenium	mg/kg	0.450 J	0.833	0.465 J	1.30	0.888	0.942	1.23
Silver	mg/kg	<0.0334	<0.0316	<0.0314	<0.0390	<0.0319	<0.0327	<0.0313
Thallium	mg/kg	0.185	0.259	0.237	0.221	0.296	0.186	0.251
Vanadium	mg/kg	18.5	21.2	18.7	25.6	30.2	25.1	23.8
Zinc	mg/kg	40.0	22.9	48.8	44.3	29.6	24.6	62.0
Anions								
Chloride	mg/kg	<4.71	<4.62	<4.11	<5.62	<4.57	6.83 J	<4.48
Fluoride	mg/kg	2.67 J	0.810 UR	3.17 J	1.23 J	<0.801	<0.813	<0.785
Sulfate	mg/kg	30.1 J	213 J	30.2 J	<9.83	21.8	<8.12	<7.84
General Chemistry								
pH (lab)	SU	7.0	6.7	8.1	6.8	5.4	4.8	5.4

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG02	KIF-BG03				KIF-BG04	
Sample Date		14-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19	19-Mar-19	19-Mar-19
Sample ID		KIF-BS-DUP01-20190314	KIF-BS-BG03-0.0/0.5-20190313	KIF-BS-BG03-1.5/3.5-20190313	KIF-BS-BG03-6.5/8.5-20190313	KIF-BS-BG03-11.5/13.5-20190313	KIF-BS-BG04-0.0/0.5-20190319	KIF-BS-BG04-0.0/1.9-20190319
Sample Depth		11 - 14 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	0 - 0.5 ft	0 - 1.9 ft
Sample Type		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
	Units							
PLM								
% ASH	%	-	2	-	-	-	<1	-
Total Metals								
Antimony	mg/kg	<0.0714	0.271 J	0.0955 J	<0.0815	<0.0829	0.0875 J	0.0783 UJ
Arsenic	mg/kg	3.32	11.9	4.11	2.91	4.97	4.07 J	3.62 J
Barium	mg/kg	137	122	59.0	141	92.4	105	114
Beryllium	mg/kg	1.34	1.02	0.949	1.09	1.63	1.07	1.05
Boron	mg/kg	3.39 J	9.51 J	6.65 J	7.99 J	7.63 J	3.09 J	3.03 J
Cadmium	mg/kg	<0.0196	0.188	0.128 J	<0.0223	<0.0227	0.0388 J	0.0313 J
Calcium	mg/kg	655	15,400	13,500	651	113	906	711
Chromium	mg/kg	30.5	30.1	25.4	31.1	28.8	30.1	32.8
Cobalt	mg/kg	21.2	17.2	13.4	21.5	32.2	20.1	20.0
Copper	mg/kg	19.5	20.6	17.2	21.3	26.1	25.4 J	28.0 J
Lead	mg/kg	9.56	49.6	14.5	23.5	15.5	12.7	10.5
Lithium	mg/kg	26.7	15.6	10.2	13.3	14.7	20.2 J	18.1 J
Mercury	mg/kg	<0.0155	0.0722 U*	0.0339 U*	<0.0205	0.0189 U*	0.0189 J	0.0175 J
Molybdenum	mg/kg	<0.188	1.51	0.461 J	<0.214	0.318 J	0.235 J	0.249 J
Nickel	mg/kg	34.2	21.1	23.1	27.7	20.9	30.6	35.6
Selenium	mg/kg	1.29	1.60	0.943	0.640 J	1.10	0.783 J	0.610 J
Silver	mg/kg	<0.0311	<0.0380	<0.0348	<0.0355	<0.0361	<0.0304	<0.0341
Thallium	mg/kg	0.262	0.438	0.254	0.417	0.320	0.239	0.266
Vanadium	mg/kg	24.5	32.7	21.6	26.7	27.7	26.0	27.5
Zinc	mg/kg	64.0	55.6	32.4	35.1	39.2	58.1	58.0
Anions								
Chloride	mg/kg	<4.51	<5.14	<4.87	<5.15	<5.27	<4.52	<4.53
Fluoride	mg/kg	<0.791	3.42	2.73	<0.903	<0.924	0.792 UJ	<0.793
Sulfate	mg/kg	<7.90	19.8	35.5	55.3	20.8	8.35 J	21.1
General Chemistry								
pH (lab)	SU	5.5	7.7	8.1	5.0	5.0	5.5	5.9

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG04		KIF-BG05				
Sample Date		19-Mar-19	19-Mar-19	18-Mar-19	18-Mar-19	18-Mar-19	18-Mar-19	18-Mar-19
Sample ID		KIF-BS-BG04-5.0/7.7-20190319	KIF-BS-BG04-10.0/11.1-20190319	KIF-BS-BG05-0.0/0.5-20190318	KIF-BS-BG05-6.5/8.5-20190318	KIF-BS-BG05-11.5/13.5-20190318	KIF-BS-BG05-16.5/18.5-20190318	KIF-BS-BG05-21.0/24.0-20190318
Sample Depth		5 - 7.7 ft	10 - 11.1 ft	0 - 0.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21 - 24 ft
Sample Type		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
PLM								
% ASH	%	-	-	2	-	-	-	-
Total Metals								
Antimony	mg/kg	0.108 J	0.0776 UJ	0.135 J	0.0727 J	0.0784 UJ	0.0769 UJ	0.0755 UJ
Arsenic	mg/kg	8.22 J	4.65 J	5.41 J	5.61 J	5.28 J	10.6 J	4.60 J
Barium	mg/kg	156	516	155	188	156	205	248
Beryllium	mg/kg	1.44	1.04	0.987	0.857	0.866	0.928	1.01
Boron	mg/kg	3.12 J	3.21 J	7.20 J	1.84 J	2.27 J	4.46 J	5.22 J
Cadmium	mg/kg	0.136	0.0723 J	0.0678 J	0.0350 J	<0.0215	0.0777 J	0.0513 J
Calcium	mg/kg	1,430	2,550	14,100	642	1,000	1,400	2,380
Chromium	mg/kg	35.0	38.3	28.8	21.9	22.6	25.0	33.8
Cobalt	mg/kg	36.3	28.6	14.0	11.7	12.0	14.6	17.1
Copper	mg/kg	19.9 J	22.2 J	20.3 J	13.8 J	23.9 J	16.0 J	38.4 J
Lead	mg/kg	14.1	7.07	16.7	18.5	10.4	12.2	9.90
Lithium	mg/kg	21.3 J	29.6 J	20.0 J	21.3 J	23.8 J	15.9 J	21.5 J
Mercury	mg/kg	0.0234 J	<0.0171	0.0376 J	0.0165 J	0.0301 J	<0.0163	<0.0191
Molybdenum	mg/kg	0.498 J	0.669 J	0.521 J	0.406 J	0.343 J	0.419 J	0.199 UJ
Nickel	mg/kg	29.1	55.5	27.7	17.8	19.6	20.6	37.0
Selenium	mg/kg	1.23 J	1.12 J	1.03 J	1.63 J	1.34 J	0.933 J	1.85 J
Silver	mg/kg	<0.0345	<0.0338	<0.0351	<0.0304	<0.0342	<0.0335	<0.0329
Thallium	mg/kg	0.239	0.271	0.275	0.185	0.170	0.205	0.282
Vanadium	mg/kg	34.0	27.0	25.7	23.0	20.5	25.6	26.9
Zinc	mg/kg	68.1	66.3	65.3	41.2	43.1	48.5	59.1
Anions								
Chloride	mg/kg	<4.77	<4.69	<5.28	<4.40	<4.53	<4.70	<4.81
Fluoride	mg/kg	2.69 J	2.51 J	2.21	1.15	4.40	1.88	1.65
Sulfate	mg/kg	181 J	138 J	25.4	14.3	12.6	27.4	20.5
General Chemistry								
pH (lab)	SU	7.0	7.6	7.8	6.1	7.2	7.6	8.4

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG05	KIF-BG06						KIF-BG07
Sample Date		18-Mar-19	25-Feb-20	25-Feb-20	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	12-Mar-19
Sample ID		KIF-BS-BG05-26.5/28.5-20190318	KIF-BS-BG06A-0.0/0.5-20200225	KIF-BS-DUP01-20200225	KIF-BS-BG06-0.0/0.5-20190711	KIF-BS-DUP01-20190711	KIF-BS-BG06-1.5/3.5-20190711	KIF-BS-BG06-6.0/8.0-20190711	KIF-BS-BG07-0.0/0.5-20190312
Sample Depth		26.5 - 28.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6 - 8 ft	0 - 0.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample	Normal Environmental Sample	Field Duplicate 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								
PLM									
% ASH	%	-	1	2	-	-	-	-	1
Total Metals									
Antimony	mg/kg	0.0758 J	-	-	0.151 J	0.125 J	0.0783 UJ	0.0824 UJ	-
Arsenic	mg/kg	5.43 J	-	-	6.32	6.11	2.78	3.04	-
Barium	mg/kg	292	-	-	199	178	251	188	-
Beryllium	mg/kg	0.969	-	-	1.11	1.06	1.14	1.11	-
Boron	mg/kg	4.01 J	-	-	5.83 J	4.77 J	4.32 J	4.90 J	-
Cadmium	mg/kg	0.0211 J	-	-	0.0575 J	0.0505 J	<0.0215	0.0234 J	-
Calcium	mg/kg	2,630	-	-	4,360 J	5,540 J	2,040 J	1,940 J	-
Chromium	mg/kg	36.7	-	-	38.1	35.5	41.1	39.6	-
Cobalt	mg/kg	16.3	-	-	19.4	17.8	14.9	19.4	-
Copper	mg/kg	25.3 J	-	-	27.4	21.8	25.1	36.7	-
Lead	mg/kg	8.25	-	-	20.6	19.9	13.7	12.9	-
Lithium	mg/kg	21.3 J	-	-	23.2	21.6	22.6	25.0	-
Mercury	mg/kg	<0.0184	-	-	0.0257 U*	0.0346 U*	0.0224 U*	<0.0176	-
Molybdenum	mg/kg	0.207 J	-	-	0.540 J	0.545 J	0.291 J	0.284 J	-
Nickel	mg/kg	36.4	-	-	38.4	37.0	32.8	37.8	-
Selenium	mg/kg	0.936 J	-	-	0.975	1.75	0.859	0.729	-
Silver	mg/kg	<0.0322	-	-	<0.0328	<0.0343	<0.0341	<0.0359	-
Thallium	mg/kg	0.304	-	-	0.338	0.330	0.324	0.353	-
Vanadium	mg/kg	23.5	-	-	32.7	28.4	28.7	28.3	-
Zinc	mg/kg	61.1	-	-	72.7	67.8	57.7	64.4	-
Anions									
Chloride	mg/kg	<4.38	-	-	<4.68	<4.75	<4.78	<5.25	-
Fluoride	mg/kg	1.49	-	-	1.46 J	1.51 J	2.49 J	1.60 J	-
Sulfate	mg/kg	16.1	-	-	9.24 J	10.6 J	15.0	47.4	-
General Chemistry									
pH (lab)	SU	8.7	-	-	7.4	7.4	7.4	6.8	-

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG07						
Sample Date		12-Mar-19	12-Mar-19	12-Mar-19	12-Mar-19	12-Mar-19	12-Mar-19	12-Mar-19
Sample ID		KIF-BS-BG07-0.0/0.5-20190312	KIF-BS-BG07-1.5/3.5-20190312	KIF-BS-BG07-6.5/8.5-20190312	KIF-BS-BG07-11.5/13.5-20190312	KIF-BS-BG07-16.5/18.5-20190312	KIF-BS-BG07-21.5/23.5-20190312	KIF-BS-BG07-26.5/28.5-20190312
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	21.5 - 23.5 ft	26.5 - 28.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Validated	Validated	Validated	Validated	Validated	Validated	Validated
	Units							
PLM								
% ASH	%	-	-	-	-	-	-	-
Total Metals								
Antimony	mg/kg	0.353	0.338	0.345	0.219 J	0.102 J	0.215 J	0.116 J
Arsenic	mg/kg	6.11	6.73	7.31	4.95	2.32	11.7	8.30
Barium	mg/kg	48.5	24.9	19.8	18.1	10.0	70.5	89.7
Beryllium	mg/kg	0.261	0.182	0.196	0.167	0.105 J	2.51	1.61
Boron	mg/kg	1.68 J	<1.67	<1.73	<1.74	<1.59	12.9	11.9 J
Cadmium	mg/kg	0.0371 J	<0.0211	<0.0218	<0.0219	<0.0200	0.273	0.276
Calcium	mg/kg	345	124	87.1	37.6 J	36.0 J	49.5 J	67.8 J
Chromium	mg/kg	16.2	18.6	28.1	11.4	5.17	19.7	20.4
Cobalt	mg/kg	4.63	1.33	1.81	13.4	1.24	50.2	23.1
Copper	mg/kg	7.61	9.90	11.2	7.21	4.10	60.4	29.5
Lead	mg/kg	14.1	7.80	9.14	19.4	3.81	46.4	18.0
Lithium	mg/kg	8.73	9.02	7.48	4.23	2.88	5.03	6.87
Mercury	mg/kg	0.174	0.188	0.105	0.0483	0.0369 J	<0.0275	<0.0216
Molybdenum	mg/kg	1.01	1.22	1.13	0.559 U*	0.392 U*	0.583 U*	0.292 U*
Nickel	mg/kg	5.98	5.07	3.74	2.80	2.25	47.4	47.8
Selenium	mg/kg	0.576 J	0.358 J	0.567 J	0.316 J	0.220 J	1.33	1.73
Silver	mg/kg	<0.0332	<0.0335	<0.0346	<0.0348	<0.0318	<0.0433	<0.0481
Thallium	mg/kg	0.216	0.214	0.197	0.166	0.0542 J	0.258	0.285
Vanadium	mg/kg	28.6	33.6	31.4	14.4	8.86	22.7	23.5
Zinc	mg/kg	22.0	22.1	16.3	11.9	8.06	170	55.4
Anions								
Chloride	mg/kg	<4.56	<4.87	<4.76	<4.89	<4.53	16.5	7.69 J
Fluoride	mg/kg	<0.800	<0.853	<0.834	<0.857	<0.795	<1.11	<1.15
Sulfate	mg/kg	28.4	22.6	<8.33	<8.56	<7.93	<11.1	<11.5
General Chemistry								
pH (lab)	SU	5.4	5.3	5.4	5.2	5.2	4.7	4.9

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG07					KIF-BG08	
Sample Date		12-Mar-19	12-Mar-19	12-Mar-19	12-Mar-19	12-Mar-19	26-Mar-19	26-Mar-19
Sample ID		KIF-BS-BG07-31.5/33.5-20190312	KIF-BS-BG07-36.5/38.5-20190312	KIF-BS-BG07-41.5/43.5-20190312	KIF-BS-BG07-46.5/48.5-20190312	KIF-BS-BG07-51.5/53.5-20190312	KIF-BS-BG08-0.0/0.5-20190326	KIF-BS-BG08-1.5/3.5-20190326
Sample Depth		31.5 - 33.5 ft	36.5 - 38.5 ft	41.5 - 43.5 ft	46.5 - 48.5 ft	51.5 - 53.5 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
Level of Review		Validated	Validated	Validated	Validated	Validated	Final-Verified	Final-Verified
	Units							
PLM								
% ASH	%	-	-	-	-	-	3	-
Total Metals								
Antimony	mg/kg	0.539	0.799	<0.0936	<0.0956	<0.0953	0.228	0.286 J
Arsenic	mg/kg	9.32	30.6	7.78	3.22	4.90	4.24	6.81
Barium	mg/kg	32.8	45.9	118	58.7	66.5	33.2	30.2
Beryllium	mg/kg	1.94	3.47	1.36	1.37	1.22	0.166	0.256
Boron	mg/kg	9.34 J	11.8 J	12.6	15.5	12.9	<1.53	<1.68
Cadmium	mg/kg	0.582	0.645	0.630	0.0988 J	0.0853 J	0.0232 J	<0.0211
Calcium	mg/kg	101	263	348	544	386	649	261
Chromium	mg/kg	16.7	25.7	19.8	14.8	21.0	11.8	12.7
Cobalt	mg/kg	23.7	25.1	43.2	10.7	28.6	6.09	30.6
Copper	mg/kg	18.2	63.8	16.4	14.0	135	5.41	11.8
Lead	mg/kg	17.0	492	23.1	8.57	10.9	9.62	15.1 J
Lithium	mg/kg	5.35	3.65	8.19	9.19	10.8	6.44	10.4 J
Mercury	mg/kg	<0.0243	0.0272 J	<0.0194	<0.0181	<0.0205	0.0654	0.145
Molybdenum	mg/kg	0.318 U*	2.66	0.319 U*	<0.251	<0.251	0.805	1.01
Nickel	mg/kg	42.4	45.5	38.7	21.2	28.7	4.69	5.83
Selenium	mg/kg	2.17	2.15	1.44	1.49	1.15	0.704	0.440 J
Silver	mg/kg	<0.0442	<0.0434	<0.0407	<0.0416	<0.0415	<0.0306	<0.0336
Thallium	mg/kg	0.182	0.189	0.532	0.283	0.307	0.163	0.234
Vanadium	mg/kg	16.3	30.6	21.6	15.2	18.0	19.6	26.5
Zinc	mg/kg	100	1,120	80.4	67.0	44.3	22.4	25.2
Anions								
Chloride	mg/kg	<6.02	<6.47	<5.79	<5.97	<5.66	4.37 J	<4.59
Fluoride	mg/kg	<1.05	<1.13	<1.01	<1.05	<0.992	2.80 J	0.805 UR
Sulfate	mg/kg	<10.5	<11.3	<10.1	<10.4	<9.90	18.3	32.0 J
General Chemistry								
pH (lab)	SU	5.3	5.8	5.8	5.7	5.8	7.2	5.1

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG08					KIF-BG09	
Sample Date		26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19
Sample ID		KIF-BS-BG08-6.5/8.5-20190326	KIF-BS-BG08-11.5/13.5-20190326	KIF-BS-BG08-16.5/18.5-20190326	KIF-BS-BG08-21.5/23.5-20190326	KIF-BS-BG08-26.5/27.5-20190326	KIF-BS-BG09-0.0/0.5-20190326	KIF-BS-DUP03-20190326
Sample Depth		6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	26.5 - 27.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Field Duplicate Sample
Level of Review	Units	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
PLM								
% ASH	%	-	-	-	-	-	5	3
Total Metals								
Antimony	mg/kg	0.230 J	0.138 J	0.157 J	0.0835 J	0.0825 UJ	0.135 J	0.131 J
Arsenic	mg/kg	6.29	5.09	1.87	1.63	4.14	3.08	3.16
Barium	mg/kg	40.8	29.4	22.6	17.9	8.50	25.6	25.5
Beryllium	mg/kg	0.312	0.301	0.363	0.410	0.279	0.152	0.144
Boron	mg/kg	<1.81	<1.68	1.75 J	<1.69	<1.80	<1.68	<1.61
Cadmium	mg/kg	<0.0228	<0.0212	<0.0209	<0.0213	<0.0226	<0.0211	0.0270 J
Calcium	mg/kg	51.6 J	67.6	41.6 J	77.1	36.0 J	260	269
Chromium	mg/kg	14.7	20.4	7.16	4.90	6.02	6.85	7.04
Cobalt	mg/kg	16.3	3.08	4.59	2.13	5.61	1.70	2.02
Copper	mg/kg	15.3	10.3	5.82	4.20	2.83	2.89	2.62
Lead	mg/kg	16.0 J	8.37 J	6.94	4.34 J	2.63 J	7.73	7.97
Lithium	mg/kg	15.2 J	11.0 J	3.68	4.61 J	1.98 J	4.77	4.52
Mercury	mg/kg	0.0850	0.0660	0.0183 J	0.0287 J	0.0189 J	0.0423	0.0428
Molybdenum	mg/kg	0.634 J	0.571 J	0.506 J	0.273 J	<0.217	0.520 J	0.502 J
Nickel	mg/kg	7.99	4.98	4.35	3.49	1.86	3.41	3.94
Selenium	mg/kg	0.893	0.728	0.680	0.630	0.374 J	0.389 J	0.553 J
Silver	mg/kg	<0.0362	<0.0337	<0.0331	<0.0339	<0.0359	<0.0335	<0.0323
Thallium	mg/kg	0.221	0.147	0.0926 J	0.0697 J	<0.0333	0.124	0.120
Vanadium	mg/kg	23.3	19.1	11.5	8.73	4.83	12.9	13.4
Zinc	mg/kg	40.4	27.8	16.0	15.4	9.46	15.4	15.6
Anions								
Chloride	mg/kg	<4.87	<4.71	<4.62	<4.77	<4.83	<4.64	<4.48
Fluoride	mg/kg	0.854 UR	0.825 UR	0.809 UR	0.835 UR	0.847 UR	0.869 J	0.795 J
Sulfate	mg/kg	<8.53	<8.24	<8.08	<8.34	<8.46	16.2	16.5
General Chemistry								
pH (lab)	SU	5.1	5.1	5.2	5.1	5.1	5.6	5.6

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG09						KIF-BG10
Sample Date		26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	25-Mar-19
Sample ID		KIF-BS-BG09-1.5/3.5-20190326	KIF-BS-BG09-6.5/8.5-20190326	KIF-BS-BG09-11.5/13.5-20190326	KIF-BS-BG09-16.5/18.5-20190326	KIF-BS-BG09-21.5/23.5-20190326	KIF-BS-BG09-26.5/28.5-20190326	KIF-BS-BG10-0.0/0.5-20190325
Sample Depth		1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	26.5 - 28.5 ft	0 - 0.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
PLM								
% ASH	%	-	-	-	-	-	-	4
Total Metals								
Antimony	mg/kg	0.139 J	0.191 J	0.104 J	0.113 J	<0.0746	<0.0753	0.316 J
Arsenic	mg/kg	2.76	4.98	2.97	5.78	2.88	1.82	8.27
Barium	mg/kg	16.3	18.2	17.3	15.7	18.6	41.4	97.5
Beryllium	mg/kg	0.109 J	0.205	0.158	0.148	0.140	0.529	0.681
Boron	mg/kg	<1.60	<1.62	<1.64	<1.65	<1.62	1.86 J	<1.85
Cadmium	mg/kg	<0.0202	<0.0204	<0.0207	<0.0208	<0.0204	<0.0207	0.133 J
Calcium	mg/kg	214	51.3 J	32.0 J	33.6 J	37.0 J	240	668
Chromium	mg/kg	8.55	11.1	9.45	7.48	10.7	9.55	13.0
Cobalt	mg/kg	1.50	1.95	1.76	9.44	2.80	11.3	7.48
Copper	mg/kg	4.49	9.41	4.27	4.45	3.39	6.69	7.47
Lead	mg/kg	5.42	8.58	5.80 J	7.60 J	3.23	6.23	26.9 J
Lithium	mg/kg	5.79	8.74	6.30 J	5.28 J	3.88	17.6	4.22 J
Mercury	mg/kg	0.0837	0.0746	0.0275 J	0.0359 J	0.0172 J	<0.0168	0.0603
Molybdenum	mg/kg	0.625	0.704	0.354 J	0.318 J	0.314 J	0.227 J	2.35
Nickel	mg/kg	3.40	4.87	3.50	3.02	3.09	9.96	7.76
Selenium	mg/kg	0.271 J	0.471 J	0.475 J	0.303 J	0.428 J	0.269 J	1.40
Silver	mg/kg	<0.0320	<0.0324	<0.0329	<0.0330	<0.0325	<0.0328	<0.0371
Thallium	mg/kg	0.127	0.154	0.0983 J	0.0780 J	0.0606 J	0.119 J	0.191
Vanadium	mg/kg	15.2	21.7	12.1	10.2	6.84	10.3	24.2
Zinc	mg/kg	12.5	22.5	15.9	14.2	12.1	22.3	75.9
Anions								
Chloride	mg/kg	<4.34	<4.49	<4.51	<4.52	<4.49	<4.58	<5.06
Fluoride	mg/kg	0.761 UR	0.787 UR	0.791 UR	0.791 UR	0.786 UR	0.803 UR	1.13 J
Sulfate	mg/kg	22.1	<7.86	<7.90	<7.90	<7.85	<8.01	13.4 J
General Chemistry								
pH (lab)	SU	5.4	5.2	5.2	5.5	5.6	5.5	6.0

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG10					KIF-BG11	
Sample Date		25-Mar-19	25-Mar-19	25-Mar-19	25-Mar-19	25-Mar-19	22-Mar-19	21-Mar-19
Sample ID		KIF-BS-BG10-0.0/2.2-20190325	KIF-BS-BG10-6.5/8.5-20190325	KIF-BS-BG10-11.5/13.5-20190325	KIF-BS-BG10-16.5/18.5-20190325	KIF-BS-BG10-20.0/22.2-20190325	KIF-BS-BG11-0.0/0.5-20190322	KIF-BS-BG11-1.5/3.5-20190321
Sample Depth		0 - 2.2 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	20 - 22.2 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
Level of Review	Units	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
PLM								
% ASH	%	-	-	-	-	-	2	-
Total Metals								
Antimony	mg/kg	0.277 J	0.299 J	0.223 J	0.410 J	0.208 J	0.187 J	0.0847 J
Arsenic	mg/kg	9.32	9.16	9.79	2.48	3.17	3.80 J	3.09 J
Barium	mg/kg	137	30.0	18.1	23.6	24.8	58.0	56.4
Beryllium	mg/kg	0.569	0.245	0.212	0.451	0.276	0.348	0.388
Boron	mg/kg	<1.72	<1.66	<1.56	4.80 J	2.97 J	2.48 J	3.12 J
Cadmium	mg/kg	0.122 J	0.0514 J	0.0243 J	0.0333 J	<0.0228	0.0421 J	<0.0203
Calcium	mg/kg	512	230	182	279	221	3,910	233
Chromium	mg/kg	15.2	14.5	21.8	9.36	6.82	14.1	15.9
Cobalt	mg/kg	27.3	10.7	6.06	14.3	7.08	7.07	8.68
Copper	mg/kg	7.74	6.54	7.24	15.4	7.84	6.66	8.52
Lead	mg/kg	29.8 J	23.3 J	11.1 J	19.1 J	11.9 J	11.3	14.4
Lithium	mg/kg	3.86 J	4.77 J	4.97 J	4.27 J	4.35 J	6.77 J	11.8 J
Mercury	mg/kg	0.0642	0.111	0.118	0.0725	0.108	0.0534	0.0346
Molybdenum	mg/kg	1.21	1.30	1.00	0.727	0.415 J	0.682	0.498 J
Nickel	mg/kg	7.44	4.48	3.34	5.10	3.41	5.49	7.77
Selenium	mg/kg	0.790	0.244 J	0.309 J	0.485 J	0.725	0.645	0.669
Silver	mg/kg	<0.0344	<0.0332	<0.0311	<0.0344	<0.0362	0.102 J	<0.0322
Thallium	mg/kg	0.453	0.225	0.153	0.187	0.184	0.160	0.200
Vanadium	mg/kg	26.3	24.9	28.0	31.1	20.2	19.9	23.5
Zinc	mg/kg	46.1	27.0	24.6	30.2	18.3	29.3	27.2
Anions								
Chloride	mg/kg	<4.74	<4.61	<4.54	<4.79	<4.98	<4.37	<4.69
Fluoride	mg/kg	0.831 UR	0.807 UR	0.795 UR	0.840 UR	0.873 UR	3.76 J	0.823 UR
Sulfate	mg/kg	29.2 J	28.8 J	25.6 J	18.7 J	8.72 UJ	9.59 J	41.1 J
General Chemistry								
pH (lab)	SU	5.7	5.4	5.3	5.2	5.4	7.6	5.2

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG11						
Sample Date		21-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19	22-Mar-19
Sample ID		KIF-BS-BG11-6.5/8.5-20190321	KIF-BS-BG11-11.5/13.5-20190321	KIF-BS-BG11-16.5/18.5-20190321	KIF-BS-BG11-21.5/23.5-20190321	KIF-BS-DUP02-20190321	KIF-BS-BG11-26.5/28.5-20190321	KIF-BS-BG11-31.5/33.5-20190322
Sample Depth		6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	21.5 - 23.5 ft	26.5 - 28.5 ft	31.5 - 33.5 ft
Sample Type		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
	Units							
PLM								
% ASH	%	-	-	-	-	-	-	-
Total Metals								
Antimony	mg/kg	0.0795 UJ	0.0913 J	0.502 J	0.396 J	0.486 J	0.297 J	0.292 J
Arsenic	mg/kg	3.17 J	3.05 J	40.0 J	40.4 J	46.0 J	12.8 J	18.8 J
Barium	mg/kg	57.7	75.9	80.4	58.4	55.6	75.2	56.5
Beryllium	mg/kg	0.990	0.405	1.08	1.59	1.84	0.933	1.33
Boron	mg/kg	2.06 J	1.83 J	3.16 J	4.09 J	3.69 J	3.60 J	3.86 J
Cadmium	mg/kg	<0.0218	<0.0206	0.0987 J	0.152 J	0.112 J	0.0879 J	0.112 J
Calcium	mg/kg	44.3 J	67.3	248	202	200	291	277
Chromium	mg/kg	20.3	12.4	28.4	12.0	11.6	13.5	11.0
Cobalt	mg/kg	14.6	7.45	2.71	22.3 J	6.80 J	18.2	21.8
Copper	mg/kg	13.7	8.58	29.5	28.3	28.8	24.0	22.6
Lead	mg/kg	11.6	12.4	22.5	61.8	43.5	37.1	34.5
Lithium	mg/kg	8.32 J	11.1 J	15.1 J	15.0 J	13.4 J	17.0 J	12.0 J
Mercury	mg/kg	0.0392	0.0752	0.0916	0.138	0.141	0.149	0.137
Molybdenum	mg/kg	0.447 J	0.568 J	5.84	3.32	3.09	1.88	2.32
Nickel	mg/kg	9.27	9.38	27.5	33.0	31.3	20.4	30.3
Selenium	mg/kg	0.833	0.446 J	0.867	0.828	0.564 J	1.15	1.23
Silver	mg/kg	<0.0346	<0.0328	<0.0403	<0.0445	<0.0397	<0.0383	<0.0429
Thallium	mg/kg	0.164	0.196	0.668	1.01	0.736	0.466	0.648
Vanadium	mg/kg	22.4	21.1	42.0	30.6	29.8	33.1	27.7
Zinc	mg/kg	25.9	29.9	106	138	150	71.1	96.8
Anions								
Chloride	mg/kg	15.6	19.3	13.0 J	6.78 J	6.05 J	<5.67	<5.88
Fluoride	mg/kg	0.822 UR	0.833 UR	0.963 UR	1.11 UR	0.989 UR	0.994 UR	1.03 UR
Sulfate	mg/kg	8.21 UJ	8.32 UJ	9.62 UJ	11.1 UJ	9.87 UJ	9.93 UJ	10.3 UJ
General Chemistry								
pH (lab)	SU	4.6	4.7	5.0	5.3	5.1	5.5	5.5

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG11	KIF-BG12					
Sample Date		22-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19
Sample ID		KIF-BS-BG11-36.5/38.5-20190322	KIF-BS-BG12-0.0/0.5-20190327	KIF-BS-BG12-0.0/0.5-20190327	KIF-BS-BG12-1.5/3.5-20190327	KIF-BS-BG12-6.5/8.5-20190327	KIF-BS-BG12-11.5/13.5-20190327	KIF-BS-BG12-16.5/18.5-20190327
Sample Depth		36.5 - 38.5 ft	0 - 0.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review	Units	Final-Verified	Final-Verified	Validated	Validated	Validated	Validated	Validated
PLM								
% ASH	%	-	4	-	-	-	-	-
Total Metals								
Antimony	mg/kg	0.346 J	-	0.266 J	0.215 J	0.193 J	0.123 J	0.0775 J
Arsenic	mg/kg	16.3 J	-	6.30	6.09 J	5.86 J	4.06 J	2.77 J
Barium	mg/kg	48.9	-	45.5	22.4	26.6	19.0	12.9
Beryllium	mg/kg	1.09	-	0.270	0.202 J	0.190 J	0.169 J	0.134 J
Boron	mg/kg	2.71 J	-	1.76 J	1.90 J	<1.66	<1.63	<1.54
Cadmium	mg/kg	0.0808 J	-	0.0478 J	<0.0205	<0.0209	<0.0206	<0.0194
Calcium	mg/kg	252	-	1,180	66.6	45.1 J	30.6 J	23.1 J
Chromium	mg/kg	9.85	-	19.2	14.1 J	14.6 J	7.42 J	5.58 J
Cobalt	mg/kg	25.8	-	2.33	1.73 J	2.08 J	1.82 J	1.75 J
Copper	mg/kg	19.5	-	7.16	10.3	10.2	7.60	4.68
Lead	mg/kg	21.9	-	11.0	11.7 J	12.7 J	9.46 J	7.11 J
Lithium	mg/kg	11.0 J	-	8.49 J	8.76	9.40	6.38	3.69
Mercury	mg/kg	0.0638	-	0.0765	0.187	0.0760	0.0486	0.0256 J
Molybdenum	mg/kg	1.40	-	1.07	0.711	0.682	0.427 J	0.253 J
Nickel	mg/kg	19.0	-	5.40	4.40	5.02	4.04	2.73
Selenium	mg/kg	1.03	-	0.698	0.598 J	0.797 J	0.355 J	0.162 J
Silver	mg/kg	<0.0393	-	0.0641 J	<0.0325	<0.0332	<0.0327	<0.0308
Thallium	mg/kg	0.466	-	0.206	0.190	0.165	0.118 J	0.0775 J
Vanadium	mg/kg	22.8	-	31.3	25.2	22.7	14.3	9.47
Zinc	mg/kg	71.1	-	25.3	17.9 J	21.6 J	16.3 J	9.89 J
Anions								
Chloride	mg/kg	<5.41	-	6.34 J	8.67 J	12.0 J	12.0 J	7.81 J
Fluoride	mg/kg	0.948 UR	-	2.00 J	0.797 UR	0.825 UR	0.794 UR	0.715 UR
Sulfate	mg/kg	9.46 UJ	-	27.7 J	7.96 UJ	8.24 UJ	7.93 UJ	7.14 UJ
General Chemistry								
pH (lab)	SU	5.4	-	6.5	4.9	4.6	4.6	4.6

See notes on last page.

TABLE B.2 - Soil Analytical Results for Percent Ash, Metals, Anions, and General Chemistry
Kingston Fossil Plant
March 2019 - February 2020

Sample Location		KIF-BG12			
Sample Date		27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19
Sample ID		KIF-BS-BG12-21.5/23.5-20190327	KIF-BS-BG12-26.5/28.5-20190327	KIF-BS-BG12-31.5/33.5-20190327	KIF-BS-BG12-35.0/37.0-20190327
Sample Depth		21.5 - 23.5 ft	26.5 - 28.5 ft	31.5 - 33.5 ft	35 - 37 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Validated	Validated	Validated	Validated
	Units				
PLM					
% ASH	%	-	-	-	-
Total Metals					
Antimony	mg/kg	0.393 J	0.147 J	0.211 J	0.173 J
Arsenic	mg/kg	13.6 J	6.31 J	9.96 J	6.82
Barium	mg/kg	166	51.2	77.0	61.2
Beryllium	mg/kg	1.02 J	1.00 J	1.15 J	0.937
Boron	mg/kg	3.44 J	11.9 J	11.4	9.47 J
Cadmium	mg/kg	1.87	0.373	0.469	0.0913 J
Calcium	mg/kg	36.1 J	44.0 J	37.5 J	41.8 J
Chromium	mg/kg	6.95 J	13.7 J	11.6 J	9.27
Cobalt	mg/kg	30.7 J	20.0 J	23.5 J	16.7
Copper	mg/kg	27.8	48.1	33.1	38.9
Lead	mg/kg	427 J	602 J	247 J	65.5
Lithium	mg/kg	5.62	18.9	15.1	13.9 J
Mercury	mg/kg	0.0347 J	<0.0220	<0.0196	<0.0213
Molybdenum	mg/kg	2.00	0.360 J	0.503 J	0.621 J
Nickel	mg/kg	23.0	18.1	16.7	19.9
Selenium	mg/kg	0.626 J	1.96 J	1.72 J	1.29
Silver	mg/kg	<0.0426	<0.0434	0.0715 J	<0.0395
Thallium	mg/kg	0.659	0.285	0.441	0.264
Vanadium	mg/kg	18.9	32.1	38.1	31.2
Zinc	mg/kg	555 J	232 J	253 J	51.3
Anions					
Chloride	mg/kg	20.1 J	6.74 J	<5.42	5.97 J
Fluoride	mg/kg	1.03 UR	1.04 UR	0.950 UR	0.922 UR
Sulfate	mg/kg	10.2 UJ	10.4 UJ	9.49 UJ	9.21 UJ
General Chemistry					
pH (lab)	SU	4.7	4.9	5.0	4.9

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. KIF-BG06A surficial PLM sample had to be recollected at a later date due to the initial sample being lost in shipment.
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.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG01			KIF-BG02			
Sample Date		28-Mar-19	28-Mar-19	28-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19	14-Mar-19
Sample ID		KIF-BS-BG01-0.0/0.5-20190328	KIF-BS-BG01-1.5/3.5-20190328	KIF-BS-BG01-6.0/8.0-20190328	KIF-BS-BG02-0.0/0.5-20190314	KIF-BS-BG02-0.7/2.7-20190314	KIF-BS-BG02-6.5/8.5-20190314	KIF-BS-BG02-11.0/14.0-20190314
Sample Depth		0 - 0.5 ft	1.5 - 3.5 ft	6 - 8 ft	0 - 0.5 ft	0.7 - 2.7 ft	6.5 - 8.5 ft	11 - 14 ft
Sample Type		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
	Units							
Radiological Parameters								
Radium-226	pCi/g	1.31 +/-(0.290)	0.792 +/-(0.197)	0.782 +/-(0.238)	1.31 +/-(0.331)	1.32 +/-(0.339)	1.47 +/-(0.339)	0.698 +/-(0.214)
Radium-228	pCi/g	1.47 +/-(0.452)	0.826 +/-(0.471)	1.76 +/-(0.348)	1.28 +/-(0.415)	1.90 +/-(0.463)	2.09 +/-(0.432)	1.94 +/-(0.410)
Radium-226+228	pCi/g	2.78 +/-(0.537)	1.62 +/-(0.511)	2.54 +/-(0.422)	2.59 +/-(0.531)	3.22 +/-(0.574)	3.56 +/-(0.549)	2.64 +/-(0.462)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG02	KIF-BG03				KIF-BG04	
Sample Date		14-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19	13-Mar-19	19-Mar-19	19-Mar-19
Sample ID		KIF-BS-DUP01-20190314	KIF-BS-BG03-0.0/0.5-20190313	KIF-BS-BG03-1.5/3.5-20190313	KIF-BS-BG03-6.5/8.5-20190313	KIF-BS-BG03-11.5/13.5-20190313	KIF-BS-BG04-0.0/0.5-20190319	KIF-BS-BG04-0.0/1.9-20190319
Sample Depth		11 - 14 ft	0 - 0.5 ft	1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	0 - 0.5 ft	0 - 1.9 ft
Sample Type		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
	Units							
Radiological Parameters								
Radium-226	pCi/g	0.845 +/-(0.290)	1.18 +/-(0.284)	1.10 +/-(0.264)	0.942 +/-(0.315)	1.18 +/-(0.333)	1.01 +/-(0.249)	0.960 +/-(0.253)
Radium-228	pCi/g	2.06 +/-(0.480)	1.66 +/-(0.353)	1.96 +/-(0.416)	2.39 +/-(0.523)	2.77 +/-(0.552)	1.38 +/-(0.361)	1.15 +/-(0.361)
Radium-226+228	pCi/g	2.91 +/-(0.561)	2.84 +/-(0.453)	3.06 +/-(0.493)	3.33 +/-(0.611)	3.95 +/-(0.645)	2.39 +/-(0.439)	2.11 +/-(0.441)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG04		KIF-BG05				
Sample Date		19-Mar-19	19-Mar-19	18-Mar-19	18-Mar-19	18-Mar-19	18-Mar-19	18-Mar-19
Sample ID		KIF-BS-BG04-5.0/7.7-20190319	KIF-BS-BG04-10.0/11.1-20190319	KIF-BS-BG05-0.0/0.5-20190318	KIF-BS-BG05-6.5/8.5-20190318	KIF-BS-BG05-11.5/13.5-20190318	KIF-BS-BG05-16.5/18.5-20190318	KIF-BS-BG05-21.0/24.0-20190318
Sample Depth		5 - 7.7 ft	10 - 11.1 ft	0 - 0.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21 - 24 ft
Sample Type		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
	Units							
Radiological Parameters								
Radium-226	pCi/g	1.12 +/-(0.285)	1.17 +/-(0.274)	1.27 +/-(0.343)	0.986 +/-(0.255)	1.14 +/-(0.240)	0.967 +/-(0.236)	0.907 +/-(0.225)
Radium-228	pCi/g	2.17 +/-(0.448)	2.04 +/-(0.455)	1.82 +/-(0.410)	2.06 +/-(0.394)	2.03 +/-(0.344)	1.17 +/-(0.353)	1.89 +/-(0.335)
Radium-226+228	pCi/g	3.29 +/-(0.531)	3.21 +/-(0.531)	3.09 +/-(0.535)	3.05 +/-(0.469)	3.17 +/-(0.419)	2.14 +/-(0.425)	2.80 +/-(0.404)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG05	KIF-BG06				KIF-BG07	
Sample Date		18-Mar-19	11-Jul-19	11-Jul-19	11-Jul-19	11-Jul-19	12-Mar-19	12-Mar-19
Sample ID		KIF-BS-BG05-26.5/28.5-20190318	KIF-BS-BG06-0.0/0.5-20190711	KIF-BS-DUP01-20190711	KIF-BS-BG06-1.5/3.5-20190711	KIF-BS-BG06-6.0/8.0-20190711	KIF-BS-BG07-0.0/0.5-20190312	KIF-BS-BG07-1.5/3.5-20190312
Sample Depth		26.5 - 28.5 ft	0 - 0.5 ft	0 - 0.5 ft	1.5 - 3.5 ft	6 - 8 ft	0 - 0.5 ft	1.5 - 3.5 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		Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Validated	Validated
	Units							
Radiological Parameters								
Radium-226	pCi/g	1.09 +/-(0.203)	1.04 +/-(0.268)	1.00 +/-(0.329)	0.622 +/-(0.157)	0.647 +/-(0.231)	1.27 +/-(0.294)	1.06 +/-(0.258)
Radium-228	pCi/g	1.59 +/-(0.291)	1.81 +/-(0.436)	1.14 +/-(0.593)	1.35 +/-(0.308)	2.23 +/-(0.443)	1.59 +/-(0.370)	1.77 +/-(0.376)
Radium-226+228	pCi/g	2.68 +/-(0.355)	2.85 +/-(0.512)	2.14 +/-(0.678)	1.97 +/-(0.346)	2.88 +/-(0.500)	2.86 +/-(0.473)	2.83 +/-(0.456)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG07						
Sample Date		12-Mar-19	12-Mar-19	12-Mar-19	12-Mar-19	12-Mar-19	12-Mar-19	12-Mar-19
Sample ID		KIF-BS-BG07-6.5/8.5-20190312	KIF-BS-BG07-11.5/13.5-20190312	KIF-BS-BG07-16.5/18.5-20190312	KIF-BS-BG07-21.5/23.5-20190312	KIF-BS-BG07-26.5/28.5-20190312	KIF-BS-BG07-31.5/33.5-20190312	KIF-BS-BG07-36.5/38.5-20190312
Sample Depth		6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	26.5 - 28.5 ft	31.5 - 33.5 ft	36.5 - 38.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Validated	Validated	Validated	Validated	Validated	Validated	Validated
	Units							
Radiological Parameters								
Radium-226	pCi/g	0.843 +/-(0.230)	0.641 +/-(0.184)	0.635 +/-(0.165)	1.36 +/-(0.417)	0.652 +/-(0.342)	1.40 +/-(0.393)	1.37 +/-(0.430)
Radium-228	pCi/g	1.26 +/-(0.326)	1.06 +/-(0.303)	0.982 +/-(0.239)	2.85 +/-(0.644)	2.43 +/-(0.991)	2.61 +/-(0.557)	2.16 +/-(0.739)
Radium-226+228	pCi/g	2.10 +/-(0.399)	1.70 +/-(0.354)	1.62 +/-(0.290)	4.21 +/-(0.767)	3.08 +/-(1.05)	4.01 +/-(0.682)	3.53 +/-(0.855)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG07			KIF-BG08			
Sample Date		12-Mar-19	12-Mar-19	12-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19
Sample ID		KIF-BS-BG07-41.5/43.5-20190312	KIF-BS-BG07-46.5/48.5-20190312	KIF-BS-BG07-51.5/53.5-20190312	KIF-BS-BG08-0.0/0.5-20190326	KIF-BS-BG08-1.5/3.5-20190326	KIF-BS-BG08-6.5/8.5-20190326	KIF-BS-BG08-11.5/13.5-20190326
Sample Depth		41.5 - 43.5 ft	46.5 - 48.5 ft	51.5 - 53.5 ft	0 - 0.5 ft	1.5 - 3.5 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
Level of Review		Validated	Validated	Validated	Final-Verified	Final-Verified	Final-Verified	Final-Verified
	Units							
Radiological Parameters								
Radium-226	pCi/g	0.683 +/-(0.243)	0.288 +/-(0.484)U	1.17 +/-(0.285)	0.748 +/-(0.181)	0.809 +/-(0.199)	1.29 +/-(0.369)	1.33 +/-(0.352)
Radium-228	pCi/g	2.27 +/-(0.566)	2.66 +/-(0.586)	2.62 +/-(0.467)	0.555 +/-(0.203)	1.14 +/-(0.236)	1.47 +/-(0.442)	1.62 +/-(0.435)
Radium-226+228	pCi/g	2.95 +/-(0.616)	2.95 +/-(0.760)J	3.79 +/-(0.547)	1.30 +/-(0.272)	1.95 +/-(0.309)	2.76 +/-(0.576)	2.95 +/-(0.560)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG08			KIF-BG09			
Sample Date		26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19
Sample ID		KIF-BS-BG08-16.5/18.5-20190326	KIF-BS-BG08-21.5/23.5-20190326	KIF-BS-BG08-26.5/27.5-20190326	KIF-BS-BG09-0.0/0.5-20190326	KIF-BS-DUP03-20190326	KIF-BS-BG09-1.5/3.5-20190326	KIF-BS-BG09-6.5/8.5-20190326
Sample Depth		16.5 - 18.5 ft	21.5 - 23.5 ft	26.5 - 27.5 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	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
	Units							
Radiological Parameters								
Radium-226	pCi/g	0.660 +/-(0.167)	0.643 +/-(0.162)	0.361 +/-(0.134)	0.861 +/-(0.234)	0.675 +/-(0.188)	0.799 +/-(0.243)	0.659 +/-(0.178)
Radium-228	pCi/g	0.569 +/-(0.302)	0.316 +/-(0.309)U	0.583 +/-(0.212)	0.659 +/-(0.227)	0.708 +/-(0.244)	0.875 +/-(0.279)	0.983 +/-(0.240)
Radium-226+228	pCi/g	1.23 +/-(0.345)	0.959 +/-(0.349)J	0.944 +/-(0.251)	1.52 +/-(0.326)	1.38 +/-(0.308)	1.67 +/-(0.370)	1.64 +/-(0.299)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG09				KIF-BG10		
Sample Date		26-Mar-19	26-Mar-19	26-Mar-19	26-Mar-19	25-Mar-19	25-Mar-19	25-Mar-19
Sample ID		KIF-BS-BG09-11.5/13.5-20190326	KIF-BS-BG09-16.5/18.5-20190326	KIF-BS-BG09-21.5/23.5-20190326	KIF-BS-BG09-26.5/28.5-20190326	KIF-BS-BG10-0.0/0.5-20190325	KIF-BS-BG10-0.0/2.2-20190325	KIF-BS-BG10-6.5/8.5-20190325
Sample Depth		11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	26.5 - 28.5 ft	0 - 0.5 ft	0 - 2.2 ft	6.5 - 8.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
	Units							
Radiological Parameters								
Radium-226	pCi/g	0.742 +/-(0.244)	0.643 +/-(0.222)	0.385 +/-(0.121)	0.411 +/-(0.142)	0.841 +/-(0.236)	0.901 +/-(0.221)	1.09 +/-(0.289)
Radium-228	pCi/g	0.835 +/-(0.258)	0.676 +/-(0.235)	0.311 +/-(0.137)U	0.803 +/-(0.210)	0.675 +/-(0.214)	0.280 +/-(0.469)U	1.36 +/-(0.414)
Radium-226+228	pCi/g	1.58 +/-(0.355)	1.32 +/-(0.323)	0.696 +/-(0.183)J	1.21 +/-(0.254)	1.52 +/-(0.319)	1.18 +/-(0.518)J	2.45 +/-(0.505)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG10			KIF-BG11			
Sample Date		25-Mar-19	25-Mar-19	25-Mar-19	22-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19
Sample ID		KIF-BS-BG10-11.5/13.5-20190325	KIF-BS-BG10-16.5/18.5-20190325	KIF-BS-BG10-20.0/22.2-20190325	KIF-BS-BG11-0.0/0.5-20190322	KIF-BS-BG11-1.5/3.5-20190321	KIF-BS-BG11-6.5/8.5-20190321	KIF-BS-BG11-11.5/13.5-20190321
Sample Depth		11.5 - 13.5 ft	16.5 - 18.5 ft	20 - 22.2 ft	0 - 0.5 ft	1.5 - 3.5 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
Level of Review		Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified
	Units							
Radiological Parameters								
Radium-226	pCi/g	0.846 +/-(0.238)	1.04 +/-(0.238)	1.04 +/-(0.246)	1.15 +/-(0.300)	1.31 +/-(0.362)	0.938 +/-(0.237)	1.41 +/-(0.323)
Radium-228	pCi/g	1.03 +/-(0.258)	0.852 +/-(0.305)	0.475 +/-(0.392)	1.28 +/-(0.429)	1.54 +/-(0.638)	1.41 +/-(0.327)	1.56 +/-(0.390)
Radium-226+228	pCi/g	1.88 +/-(0.351)	1.89 +/-(0.387)	1.52 +/-(0.463)	2.43 +/-(0.523)	2.85 +/-(0.734)	2.35 +/-(0.404)	2.97 +/-(0.506)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG11						KIF-BG12
Sample Date		21-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19	22-Mar-19	22-Mar-19	27-Mar-19
Sample ID		KIF-BS-BG11-16.5/18.5-20190321	KIF-BS-BG11-21.5/23.5-20190321	KIF-BS-DUP02-20190321	KIF-BS-BG11-26.5/28.5-20190321	KIF-BS-BG11-31.5/33.5-20190322	KIF-BS-BG11-36.5/38.5-20190322	KIF-BS-BG12-0.0/0.5-20190327
Sample Depth		16.5 - 18.5 ft	21.5 - 23.5 ft	21.5 - 23.5 ft	26.5 - 28.5 ft	31.5 - 33.5 ft	36.5 - 38.5 ft	0 - 0.5 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		Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Final-Verified	Validated
	Units							
Radiological Parameters								
Radium-226	pCi/g	2.16 +/-(0.520)	2.27 +/-(0.472)	2.05 +/-(0.410)	1.55 +/-(0.303)	2.04 +/-(0.514)	1.54 +/-(0.300)	1.04 +/-(0.311)
Radium-228	pCi/g	1.96 +/-(0.507)	1.99 +/-(0.548)J	1.24 +/-(0.371)J	1.52 +/-(0.372)	1.37 +/-(0.724)	0.953 +/-(0.332)	1.78 +/-(0.356)
Radium-226+228	pCi/g	4.12 +/-(0.726)	4.26 +/-(0.723)J	3.29 +/-(0.553)J	3.07 +/-(0.480)	3.41 +/-(0.888)	2.49 +/-(0.447)	2.82 +/-(0.473)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG12						
Sample Date		27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19	27-Mar-19
Sample ID		KIF-BS-BG12-1.5/3.5-20190327	KIF-BS-BG12-6.5/8.5-20190327	KIF-BS-BG12-11.5/13.5-20190327	KIF-BS-BG12-16.5/18.5-20190327	KIF-BS-BG12-21.5/23.5-20190327	KIF-BS-BG12-26.5/28.5-20190327	KIF-BS-BG12-31.5/33.5-20190327
Sample Depth		1.5 - 3.5 ft	6.5 - 8.5 ft	11.5 - 13.5 ft	16.5 - 18.5 ft	21.5 - 23.5 ft	26.5 - 28.5 ft	31.5 - 33.5 ft
Sample Type		Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample	Normal Environmental Sample
Level of Review		Validated	Validated	Validated	Validated	Validated	Validated	Validated
	Units							
Radiological Parameters								
Radium-226	pCi/g	1.11 +/-(0.270)	1.17 +/-(0.328)	1.04 +/-(0.264)	0.650 +/-(0.255)	1.12 +/-(0.250)	1.70 +/-(0.374)	1.67 +/-(0.400)
Radium-228	pCi/g	1.79 +/-(0.368)	1.66 +/-(0.393)	1.13 +/-(0.388)	1.03 +/-(0.298)	1.33 +/-(0.281)	2.23 +/-(0.525)	1.41 +/-(0.882)
Radium-226+228	pCi/g	2.90 +/-(0.456)	2.83 +/-(0.512)	2.17 +/-(0.469)	1.68 +/-(0.392)	2.45 +/-(0.376)	3.93 +/-(0.645)	3.08 +/-(0.968)

See notes on last page.

TABLE B.3 – Soil Analytical Results for Radiological Parameters
Kingston Fossil Plant
March 2019 - July 2019

Sample Location		KIF-BG12
Sample Date		27-Mar-19
Sample ID		KIF-BS-BG12-35.0/37.0-20190327
Sample Depth		35 - 37 ft
Sample Type		Normal Environmental Sample
Level of Review		Validated
	Units	
Radiological Parameters		
Radium-226	pCi/g	2.05 +/-(0.452)
Radium-228	pCi/g	2.33 +/-(0.485)
Radium-226+228	pCi/g	4.38 +/-(0.663)

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.

TABLE B.4 - Soil Field pH Results
Kingston Fossil Plant
March 2019 - July 2019

Sample Location	Sample ID	Sample Date	Sample Depth	pH (field)
				SU
KIF-BG01	KIF-BS-BG01-0.0/0.5-20190328	28-Mar-19	0 - 0.5 ft	6.21
	KIF-BS-BG01-1.5/3.5-20190328	28-Mar-19	1.5 - 3.5 ft	5.87
	KIF-BS-BG01-6.0/8.0-20190328	28-Mar-19	6 - 8 ft	6.83
KIF-BG02	KIF-BS-BG02-0.0/0.5-20190314	14-Mar-19	0 - 0.5 ft	6.92
	KIF-BS-BG02-0.7/2.7-20190314	14-Mar-19	0.7 - 2.7 ft	4.71
	KIF-BS-BG02-6.5/8.5-20190314	14-Mar-19	6.5 - 8.5 ft	4.84
	KIF-BS-BG02-11.0/14.0-20190314	14-Mar-19	11 - 14 ft	5.63
KIF-BG03	KIF-BS-BG03-0.0/0.5-20190313	13-Mar-19	0 - 0.5 ft	7.49
	KIF-BS-BG03-1.5/3.5-20190313	13-Mar-19	1.5 - 3.5 ft	7.86
	KIF-BS-BG03-6.5/8.5-20190313	13-Mar-19	6.5 - 8.5 ft	5.33
	KIF-BS-BG03-11.5/13.5-20190313	13-Mar-19	11.5 - 13.5 ft	4.48
KIF-BG04	KIF-BS-BG04-0.0/0.5-20190319	19-Mar-19	0 - 0.5 ft	5.63
	KIF-BS-BG04-0.0/1.9-20190319	19-Mar-19	0 - 1.9 ft	5.20
	KIF-BS-BG04-5.0/7.7-20190319	19-Mar-19	5 - 7.7 ft	6.56
	KIF-BS-BG04-10.0/11.1-20190319	19-Mar-19	10 - 11.1 ft	7.22
KIF-BG05	KIF-BS-BG05-0.0/0.5-20190318	18-Mar-19	0 - 0.5 ft	7.46
	KIF-BS-BG05-6.5/8.5-20190318	18-Mar-19	6.5 - 8.5 ft	5.71
	KIF-BS-BG05-11.5/13.5-20190318	18-Mar-19	11.5 - 13.5 ft	6.79
	KIF-BS-BG05-16.5/18.5-20190318	18-Mar-19	16.5 - 18.5 ft	7.50
	KIF-BS-BG05-21.0/24.0-20190318	18-Mar-19	21 - 24 ft	7.90
	KIF-BS-BG05-26.5/28.5-20190318	18-Mar-19	26.5 - 28.5 ft	7.94
KIF-BG06	KIF-BS-BG06-0.0/0.5-20190711	11-Jul-19	0 - 0.5 ft	6.92
	KIF-BS-BG06-1.5/3.5-20190711	11-Jul-19	1.5 - 3.5 ft	6.23
	KIF-BS-BG06-6.0/8.0-20190711	11-Jul-19	6 - 8 ft	6.30
KIF-BG07	KIF-BS-BG07-0.0/0.5-20190312	12-Mar-19	0 - 0.5 ft	5.89
	KIF-BS-BG07-1.5/3.5-20190312	12-Mar-19	1.5 - 3.5 ft	5.30
	KIF-BS-BG07-6.5/8.5-20190312	12-Mar-19	6.5 - 8.5 ft	4.02
	KIF-BS-BG07-11.5/13.5-20190312	12-Mar-19	11.5 - 13.5 ft	4.07
	KIF-BS-BG07-16.5/18.5-20190312	12-Mar-19	16.5 - 18.5 ft	4.14
	KIF-BS-BG07-21.5/23.5-20190312	12-Mar-19	21.5 - 23.5 ft	4.14
	KIF-BS-BG07-26.5/28.5-20190312	12-Mar-19	26.5 - 28.5 ft	3.98
	KIF-BS-BG07-31.5/33.5-20190312	12-Mar-19	31.5 - 33.5 ft	4.78
	KIF-BS-BG07-36.5/38.5-20190312	12-Mar-19	36.5 - 38.5 ft	5.24
	KIF-BS-BG07-41.5/43.5-20190312	12-Mar-19	41.5 - 43.5 ft	4.45
	KIF-BS-BG07-46.5/48.5-20190312	12-Mar-19	46.5 - 48.5 ft	4.52
	KIF-BS-BG07-51.5/53.5-20190312	12-Mar-19	51.5 - 53.5 ft	5.29
KIF-BG08	KIF-BS-BG08-0.0/0.5-20190326	26-Mar-19	0 - 0.5 ft	6.80
	KIF-BS-BG08-1.5/3.5-20190326	26-Mar-19	1.5 - 3.5 ft	4.58
	KIF-BS-BG08-6.5/8.5-20190326	26-Mar-19	6.5 - 8.5 ft	4.59
	KIF-BS-BG08-11.5/13.5-20190326	26-Mar-19	11.5 - 13.5 ft	4.66
	KIF-BS-BG08-16.5/18.5-20190326	26-Mar-19	16.5 - 18.5 ft	4.36
	KIF-BS-BG08-21.5/23.5-20190326	26-Mar-19	21.5 - 23.5 ft	5.10
	KIF-BS-BG08-26.5/27.5-20190326	26-Mar-19	26.5 - 27.5 ft	4.79
KIF-BG09	KIF-BS-BG09-0.0/0.5-20190326	26-Mar-19	0 - 0.5 ft	5.62
	KIF-BS-BG09-1.5/3.5-20190326	26-Mar-19	1.5 - 3.5 ft	5.05
	KIF-BS-BG09-6.5/8.5-20190326	26-Mar-19	6.5 - 8.5 ft	4.63
	KIF-BS-BG09-11.5/13.5-20190326	26-Mar-19	11.5 - 13.5 ft	5.01
	KIF-BS-BG09-16.5/18.5-20190326	26-Mar-19	16.5 - 18.5 ft	5.11
	KIF-BS-BG09-21.5/23.5-20190326	26-Mar-19	21.5 - 23.5 ft	5.18
	KIF-BS-BG09-26.5/28.5-20190326	26-Mar-19	26.5 - 28.5 ft	5.63

See notes on last page.

TABLE B.4 - Soil Field pH Results
Kingston Fossil Plant
March 2019 - July 2019

Sample Location	Sample ID	Sample Date	Sample Depth	pH (field)
				SU
KIF-BG10	KIF-BS-BG10-0.0/0.5-20190325	25-Mar-19	0 - 0.5 ft	5.79
	KIF-BS-BG10-0.0/2.2-20190325	25-Mar-19	0 - 2.2 ft	5.85
	KIF-BS-BG10-6.5/8.5-20190325	25-Mar-19	6.5 - 8.5 ft	5.18
	KIF-BS-BG10-11.5/13.5-20190325	25-Mar-19	11.5 - 13.5 ft	5.09
	KIF-BS-BG10-16.5/18.5-20190325	25-Mar-19	16.5 - 18.5 ft	4.79
	KIF-BS-BG10-20.0/22.2-20190325	25-Mar-19	20 - 22.2 ft	5.32
KIF-BG11	KIF-BS-BG11-0.0/0.5-20190322	22-Mar-19	0 - 0.5 ft	7.39
	KIF-BS-BG11-1.5/3.5-20190321	21-Mar-19	1.5 - 3.5 ft	7.75
	KIF-BS-BG11-6.5/8.5-20190321	21-Mar-19	6.5 - 8.5 ft	4.76
	KIF-BS-BG11-11.5/13.5-20190321	21-Mar-19	11.5 - 13.5 ft	5.56
	KIF-BS-BG11-16.5/18.5-20190321	21-Mar-19	16.5 - 18.5 ft	5.04
	KIF-BS-BG11-21.5/23.5-20190321	21-Mar-19	21.5 - 23.5 ft	5.25
	KIF-BS-BG11-26.5/28.5-20190321	21-Mar-19	26.5 - 28.5 ft	4.97
	KIF-BS-BG11-31.5/33.5-20190322	22-Mar-19	31.5 - 33.5 ft	5.28
	KIF-BS-BG11-36.5/38.5-20190322	22-Mar-19	36.5 - 38.5 ft	5.47
KIF-BG12	KIF-BS-BG12-0.0/0.5-20190327	27-Mar-19	0 - 0.5 ft	5.67
	KIF-BS-BG12-1.5/3.5-20190327	27-Mar-19	1.5 - 3.5 ft	4.87
	KIF-BS-BG12-6.5/8.5-20190327	27-Mar-19	6.5 - 8.5 ft	4.90
	KIF-BS-BG12-11.5/13.5-20190327	27-Mar-19	11.5 - 13.5 ft	5.02
	KIF-BS-BG12-16.5/18.5-20190327	27-Mar-19	16.5 - 18.5 ft	4.99
	KIF-BS-BG12-21.5/23.5-20190327	27-Mar-19	21.5 - 23.5 ft	5.00
	KIF-BS-BG12-26.5/28.5-20190327	27-Mar-19	26.5 - 28.5 ft	5.16
	KIF-BS-BG12-31.5/33.5-20190327	27-Mar-19	31.5 - 33.5 ft	4.89
	KIF-BS-BG12-35.0/37.0-20190327	27-Mar-19	35 - 37 ft	5.06

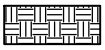
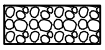
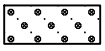
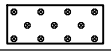
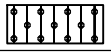
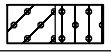
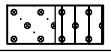
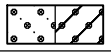
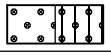
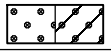
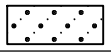
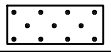
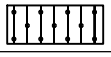
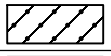
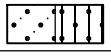
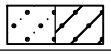
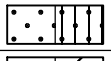
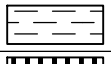
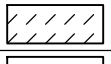
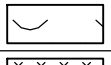
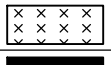
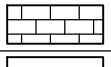
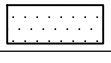
Notes:

ft	feet below ground surface
ID	identification
SU	Standard Unit

APPENDIX C - SUBSURFACE LOGS

Subsurface Boring Legend

Lithology Graphics

Symbol	Lithology
	Fill
	Top Soil
	Gravel
	Well Graded Gravel (GW)
	Poorly Graded Gravel (GP)
	Silty Gravel (GM)
	Silty, Clayey Gravel (GC-GM)
	Clayey Gravel (GC)
	Well Graded Gravel with Silt (GW-GM)
	Well Graded Gravel with Clay (GW-GC)
	Poorly Graded Gravel with Silt (GP-GM)
	Poorly Graded Gravel with Clay (GP-GC)
	Well Graded Sand (SW)
	Poorly Graded Sand (SP)
	Silty Sand (SM)
	Silty, Clayey Sand (SC-SM)
	Clayey Sand (SC)
	Well Graded Sand with Silt (SW-SM)
	Well Graded Sand with Clay (SW-SC)
	Poorly Graded Sand with Silt (SP-SM)
	Poorly Graded Sand with Clay (SP-SC)
	Silt (ML)
	Silty Clay (CL-ML)
	Lean Clay (CL)
	Organic Silt (OL)
	Elastic Silt (MH)
	Fat Clay (CH)
	Organic Clay (OH)
	Shale
	Siltstone
	Coal
	Limestone
	Sandstone

Lithology Graphics are based on TVA drafting standards.

Other Graphics

Symbol	Description
	Denotes environmental analytical sample interval
	Denotes SS sample interval
	Denotes ST sample interval
	Denotes DP sample interval
	Denotes RS sample interval
	Denotes RC sample interval
	First water level reading
	Second water level reading

Common Abbreviations

Abbreviation	Definition
DP	Direct Push
HA	Hand Auger
HSA	Hollow Stem Auger
N/A	Not Applicable
NR	Not Recorded
RC	Rock Core
RQD	Rock Quality Designation
RS	Rotary Sonic
SS	Split Spoon
ST	Shelby Tube
WH	Weight of Hammer
WR	Weight of Rod

General Notes

The boring logs include sample numbering used during drilling. For assigned Environmental Analytical Sample ID numbers, see relevant Environmental Chain-of- Custody forms from the drilling date range listed on each log.

For pH readings and additional field data, see applicable field documentation (e.g., Soil pH Data Form) from the drilling date range listed on each log.

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG01**
Client	Tennessee Valley Authority	Boring Location	573,590.26 N; 2,404,743.66 E NAD83
Project Number	175668043	Surface Elevation	771.7 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	3/28/19
Completed	3/28/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	771.7		Top of Hole						
0.5	771.2		ORGANIC SILT, OL, 10YR 4/6 (dark yellowish brown), loose, dry		HA01	0.0 - 0.5		0.5	
			FAT CLAY, CH, 10YR 5/6 (yellowish brown), high plasticity, moist		DP01	0.0 - 5.0	0.0 - 5.0	3.2	N/A
4.0	767.7		CLAYEY SILT, ML, 10YR 4/3 (brown), very dense, dry Shale fragments observed from 4.5' to 5.0'						
			Color change to 2.5Y 6/2 (pale red)		DP02	5.0 - 8.0	5.0 - 8.0	3.0	N/A
7.8	763.9								
8.0	763.7		Shale						
			Bedrock Refusal / Bottom of Hole at 8.0 Ft.						

HA[4] 1.5/3.5-20190328

6.0/8.0-20190328

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190328) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG02**
Client	Tennessee Valley Authority	Boring Location	572,746.20 N; 2,403,194.85 E NAD83
Project Number	175668043	Surface Elevation	797.6 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/14/19
		Completed	3/14/19
Project Location	Harriman, Tennessee	Depth to Water	N/A
		Date/Time	N/A
Inspector	J. Andrew	Logger	M. Edmunds
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	797.6		Top of Hole						
0.1	797.5		Topsoil, roots, and sand		HA[4]	HA01	0.0 - 0.5	0.5	
			LEAN CLAY WITH SILT, CL, 5YR 3/1 (very dark gray) to 5YR 4/6 (yellowish red), non-plastic to low plasticity, firm, moist	0.7/2.7-20190314		DP01	0.0 - 5.0	3.3	N/A
			Color change to 5YR 5/6 (yellowish red), low plasticity, firm to stiff, some manganese concretions at 5.0'	6.5/8.5-20190314		DP02	5.0 - 10.0	5.0	N/A
9.0	788.6								
10.0	787.6		WELL GRADED SAND WITH CLAY, SW-SC, 5YR 3/3 (dark reddish brown), medium to coarse, loose to medium dense, moist, with abundant shale gravel and saprolitic shale clay						
			SILTY LEAN CLAY, CL, 10YR 5/3 (brown), low plasticity, firm, dry, saprolitic bedrock, shale gravel, historical bedding structure maintained	11.0/14.0-20190314		DP03	10.0 - 15.0	5.0	N/A

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-BG02**
Client Tennessee Valley Authority
Boring Location 572,746.20 N; 2,403,194.85 E NAD83
Project Number 175668043
Surface Elevation 797.6 ft
Elevation Datum NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
14			SILTY LEAN CLAY, CL, 10YR 5/3 (brown), low plasticity, firm, dry, saprolitic bedrock, shale gravel, historical bedding structure maintained *(Continued)*					
15								
15.5	782.1		Bedrock Refusal / Bottom of Hole at 15.5 Ft.					

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190314) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG03**
Client	Tennessee Valley Authority	Boring Location	571,694.92 N; 2,405,055.07 E NAD83
Project Number	175668043	Surface Elevation	747.8 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	3/13/19
Completed	3/13/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	747.8		Top of Hole						
0			ORGANIC SILT, OL, 7.5YR 5/2 (brown), firm, moist	HA[4]	HA01	0.0 - 0.5		0.5	
1.5	746.3		LEAN CLAY, CL, 7.5YR 5/4 (brown), low plasticity, firm, moist, chert fragments (coarse) throughout	1.5/3.5-20190313	DP01	0.0 - 5.0	0.0 - 5.0	2.7	N/A
			Dry at 6.0'						
			Color change to 7.5YR 6/1 (gray), low plasticity, very hard at 7.0'	6.5/8.5-20190313	DP02	5.0 - 10.0	5.0 - 10.0	4.5	N/A
				11.5/13.5-20190313	DP03	10.0 - 14.1	10.0 - 14.1	4.1	N/A
13.0	734.8								
14.1	733.7		Shale, dark gray, very hard, laminated, moderately weathered, bedrock, some mica (weathered) between laminations						
			Bedrock Refusal / Bottom of Hole at 14.1 Ft.						

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190313) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG04**
Client	Tennessee Valley Authority	Boring Location	576,062.41 N; 2,406,622.14 E NAD83
Project Number	175668043	Surface Elevation	791.2 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	3/19/19
Completed	3/19/19		
Project Location	Harriman, Tennessee	Depth to Water	1.4 ft
Date/Time	3/19/19 11:55		
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	791.2		Top of Hole						
0.5	790.7		CLAYEY SILT, ML, low plasticity, soft, moist, some embedded tree roots		HA01	0.0 - 0.5		0.5	
			SILT, ML, 7.5YR 4/3 (brown), soft, moist		DP01	0.0 - 5.0		1.9	N/A
5.0	786.2		FAT CLAY, CH, 2.5Y 4/2 (dark grayish brown), high plasticity, firm, moist		DP02	5.0 - 10.0		2.7	N/A
9.0	782.2		Wet at 8.5'						
10.0	781.2		FAT CLAY, CH, 2.5Y 3/1 (very dark gray), medium plasticity, wet, with black shale fragments						
11.1	780.1		Shale, black, wet, fissile		DP03	10.0 - 11.1		1.1	N/A
			Bedrock Refusal / Bottom of Hole at 11.1 Ft.						

HA01 0.0/0.5-20190319
DP01 0.0 - 5.0
DP02 5.0 - 10.0
DP03 10.0 - 11.1

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190319) sampled using hand auger

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG05**
Client	Tennessee Valley Authority	Boring Location	576,831.04 N; 2,406,882.84 E NAD83
Project Number	175668043	Surface Elevation	777.8 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/18/19
		Completed	3/18/19
Project Location	Harriman, Tennessee	Depth to Water	13.0 ft
		Date/Time	3/18/19 14:00
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
		Drop	N/A
		Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	777.8		Top of Hole						
1.0	776.8		ORGANIC SILT, OL, 2.5YR 3/3 (dark reddish brown), loose, moist		HA[4]				
			No recovery		DP01	0.0 - 5.0	0.0 - 5.0	0.0	N/A
5.0	772.8		FAT CLAY, CH, 10YR 4/4 (dark yellowish brown), medium plasticity, soft, moist		6.5/8.5-20190318 DP02	5.0 - 10.0	5.0 - 10.0	3.4	N/A
			Limestone cobbles embedded at 9.5'						
			Wet at 13.0'		11.5/13.5-20190318 DP03	10.0 - 15.0	10.0 - 15.0	5.0	N/A
			Color change to 5GY 3/2 (very dark grayish green) at 14.0'						
			Color change to 10Y 2.5/1 (greenish black), wet, with limestone cobbles at 15.0'		16.5/18.5-20190318 DP04	15.0 - 20.0	15.0 - 20.0	5.0	N/A

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-BG05**
Client Tennessee Valley Authority
Boring Location 576,831.04 N; 2,406,882.84 E NAD83
Project Number 175668043
Surface Elevation 777.8 ft
Elevation Datum NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18			FAT CLAY, CH, 10YR 4/4 (dark yellowish brown), medium plasticity, soft, moist *(Continued)*					
19								
20								
21								
22					21.0/24.0-20190318			
23	23.5	754.3			DP05	20.0 - 25.0	5.0	N/A
24			WELL GRADED GRAVEL, GW, N 4/ (dark gray), coarse, loose, wet					
25								
26								
27					26.5/28.5-20190318			
28					DP06	25.0 - 29.3	4.3	N/A
29	29.3	748.5	Limestone boulders at 28.9'					
			Bedrock Refusal / Bottom of Hole at 29.3 Ft.					

20.0 - 25.0

25.0 - 29.3

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG06**
Client	Tennessee Valley Authority	Boring Location	575,777.09 N; 2,406,717.09 E NAD83
Project Number	175668043	Surface Elevation	776.6 ft
Elevation Datum	NGVD29		
Project Name	KIF TDEC Order	Date Started	7/11/19
Completed	7/11/19		
Project Location	Harriman, Tennessee	Depth to Water	N/A
Date/Time	N/A		
Inspector	C. Sexton	Logger	C. Sexton
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	776.6		Top of Hole						
0.6	776.0		CLAYEY SILT WITH GRAVEL, MH, 10YR 5/3 (brown) and 10GY 6/1 (greenish gray), low to medium plasticity, soft, dry, iron oxide staining		HA01 (HA[4])	0.0 - 0.5		0.5	
					DP01a	0.0 - 1.5			
			SILTY FAT CLAY SOME GRAVEL, CL, 5Y 5/3 (olive), medium to high plasticity, soft to firm, moist to wet, iron oxide staining		DP01bE (1.5/3.5-20190711)	1.5 - 3.5	0.0 - 5.0	3.9	N/A
					DP01cG	3.5 - 5.0			
					DP02aG	5.0 - 6.0			
			Color change to 10BG 5/1 (greenish gray) from 6.5' to 7.3'		DP02bE (6.0/8.0-20190711)	6.0 - 8.0	5.0 - 9.5	3.7	N/A
8.0	768.6		Mg nodules at 7.3' Highly weathered shale below 7.3'						
					DP02cG	8.0 - 9.5			
9.5	767.1		SILT, 2.5Y 5/1 (gray), soft to hard, dry, iron oxide staining, fissured, weathered shale						
			Bedrock Refusal / Bottom of Hole at 9.5 Ft.						
			Top of Rock = 9.5 Ft. Top of Rock Elevation = 767.1 Ft.						

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190711) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG07**
Client	Tennessee Valley Authority	Boring Location	570,793.51 N; 2,414,941.22 E NAD83
Project Number	175668043	Surface Elevation	783.4 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/12/19
		Completed	3/12/19
Project Location	Harriman, Tennessee	Depth to Water	27.0 ft
		Date/Time	3/27/19 14:20
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	783.4		Top of Hole						
			SANDY SILT, ML, 5YR 4/6 (yellowish red), firm, dry		HA[4] HA01	0.0 - 0.5		0.5	
				1.5/3.5-20190312	DP01	0.0 - 5.0	0.0 - 5.0	5.0	N/A
				6.5/8.5-20190312	DP02	5.0 - 10.0	5.0 - 10.0	5.0	N/A
9.0	774.4								
			CLAYEY ELASTIC SILT, MH, 5YR 6/8 (reddish yellow), soft, moist Color change to 7.5YR 5/8 (strong brown) at 10.0'						
12.5	770.9			11.5/13.5-20190312	DP03	10.0 - 15.0	10.0 - 15.0	5.0	N/A
			CLAYEY SAND, SC, 7.5YR 6/8 (reddish yellow), non-plastic, medium dense, moist						
				16.5/18.5-20190312	DP04	15.0 - 20.0	15.0 - 20.0	5.0	N/A

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG07**
Client: Tennessee Valley Authority
Boring Location: 570,793.51 N; 2,414,941.22 E NAD83
Project Number: 175668043
Surface Elevation: 783.4 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18.5	764.9							
			Sandstone, olive, weathered, moist, bedrock, very stiff					
20.0	763.4							
			FAT CLAY, CH, 7.5YR 6/8 (reddish yellow), high plasticity, soft, moist					
				21.5/23.5-20190312	DP05	20.0 - 25.0	5.0	N/A
			Wet at 27.0'	26.5/28.5-20190312	DP06	25.0 - 30.0	5.0	N/A
			Very soft at 30.0'	31.5/33.5-20190312	DP07	30.0 - 35.0	5.0	N/A
				36.5/38.5-20190312	DP08	35.0 - 40.0	5.0	N/A
			Color change to 10YR 4/3 (brown) at 40.0'					

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID N/A
Stantec Boring No. **KIF-BG07**
Client Tennessee Valley Authority
Boring Location 570,793.51 N; 2,414,941.22 E NAD83
Project Number 175668043
Surface Elevation 783.4 ft
Elevation Datum NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
43			FAT CLAY, CH, 7.5YR 6/8 (reddish yellow), high plasticity, soft, moist *(Continued)* Coarse sandstone fragments from 43.0' to 45.0'		41.5/43.5-20190312				
44									
45						DP09	40.0 - 45.0	5.0	N/A
46							40.0 - 45.0		
47					46.5/48.5-20190312				
48						DP10	45.0 - 50.0	5.0	N/A
49							45.0 - 50.0		
50									
51									
52					51.5/53.5-20190312	DP11	50.0 - 53.5	3.5	N/A
53	53.0	730.4					50.0 - 53.5		
	53.5	729.9	Chert, fragmented to consolidated						
			Bedrock Refusal / Bottom of Hole at 53.5 Ft.						

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190312) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG08**
Client	Tennessee Valley Authority	Boring Location	580,466.24 N; 2,411,765.65 E NAD83
Project Number	175668043	Surface Elevation	758.1 ft
Project Name	KIF TDEC Order	Date Started	3/26/19
Project Location	Harriman, Tennessee	Depth to Water	17.5 ft
Inspector	J. Andrew	Logger	D. Mihalek
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price
Elevation Datum	NGVD29	Completed	3/26/19
Date/Time	3/26/19 10:30	Date/Time	N/A

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2] / RQD %	Depth Ft[3] / Run Ft	Rec. Ft / Rec. Ft	Blows/PSI / Rec. %
0.0	758.1		Top of Hole					
0			ORGANIC SILT, OL, 10YR 4/3 (brown), loose, moist, topsoil with organics		HA[4] HA01	0.0 - 0.5	0.5	
1.5	756.6		CLAYEY SILT, ML, 10YR 5/6 (yellowish brown), non-plastic, soft, moist		1.5/3.5-20190326 DP01	0.0 - 5.0	5.0	N/A
5.0	753.1		SILTY LEAN CLAY, CL, 10YR 5/6 (yellowish brown), low plasticity, firm to stiff, moist		6.5/8.5-20190326 DP02	5.0 - 10.0	5.0	N/A
			Medium plasticity, soft at 12.5'		11.5/13.5-20190326 DP03	10.0 - 12.5	3.2	N/A
					DP04	12.5 - 15.0	3.4	N/A
15.0	743.1		FAT CLAY, CH, 10YR 5/6 (yellowish brown), high plasticity, soft, moist		16.5/18.5-20190326 DP05	15.0 - 17.5	3.7	N/A
			Wet at 17.5'					

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG08**
Client: Tennessee Valley Authority
Boring Location: 580,466.24 N; 2,411,765.65 E NAD83
Project Number: 175668043
Surface Elevation: 758.1 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
18.5	739.6							
			CLAYEY SAND, SC, 7.5YR 5/8 (strong brown), very loose, wet		DP06	17.5 - 20.0	3.0	N/A
					DP07	20.0 - 22.5	3.7	N/A
					DP08	22.5 - 25.0	2.5	N/A
					DP09	25.0 - 27.5	2.5	N/A
27.0	731.1							
27.5	730.6		Sandstone, dark gray					

21.5/23.5-20190326
26.5/27.5-20190326
17.5 - 20.0
20.0 - 22.5
22.5 - 25.0
25.0 - 27.5

Bedrock Refusal /
Bottom of Hole at 27.5 Ft.

DPT runs beyond 10.0 ft are 2.5 ft in length to allow for swelling soils. Recovery greater than run length due to swell

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190326) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG09**
Client	Tennessee Valley Authority	Boring Location	581,532.93 N; 2,412,635.80 E NAD83
Project Number	175668043	Surface Elevation	773.6 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/26/19
		Completed	3/26/19
Project Location	Harriman, Tennessee	Depth to Water	28.0 ft
		Date/Time	3/26/19 15:05
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
		Drop	N/A
		Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology Depth Ft[3]	Elevation	Graphic	Description	Overburden: / Rock Core:	Sample[1,2] / RQD %	Depth Ft[3] / Run Ft	Rec. Ft / Rec. Ft	Blows/PSI / Rec. %
0.0	773.6		Top of Hole					
0.5	773.1		ORGANIC SILT, OL, 10YR 3/3 (dark brown), soft, dry, soft with organics		HA01	0.0 - 0.5	0.5	
			SILTY SAND, SM, 10YR 5/6 (yellowish brown), medium dense, moist		DP01	0.0 - 5.0	5.0	N/A
3.8	769.8							
			SILTY LEAN CLAY, CL, 5YR 4/6 (yellowish red), low plasticity, firm, moist					
5.0	768.6		SILTY SAND, SM, 10YR 5/6 (yellowish brown), medium dense, moist					
7.5	766.1				DP02	5.0 - 10.0	4.5	N/A
			SILTY LEAN CLAY, CL, 10YR 5/6 (yellowish brown), soft, moist					
			Wet at 11.0'		DP03	10.0 - 15.0	4.1	N/A
15.0	758.6							
			SILTY SAND, SM, 10YR 6/8 (brownish yellow), fine to medium, loose, wet					
			Weathered sandstone at 17.0'		DP04	15.0 - 20.0	4.2	N/A
17.5	756.1							

HA[4] 1.5/3.5-20190326 6.5/8.5-20190326 11.5/13.5-20190326 16.5/18.5-20190326

0.0 - 5.0 5.0 - 10.0 10.0 - 15.0 15.0 - 20.0

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG09**
Client: Tennessee Valley Authority
Boring Location: 581,532.93 N; 2,412,635.80 E NAD83
Project Number: 175668043
Surface Elevation: 773.6 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
20.0	753.6		SILTY LEAN CLAY, CL, 10YR 5/6 (yellowish brown), soft, wet *(Continued)*					
			SILTY SAND, SM, 10YR 6/8 (brownish yellow), fine to medium, loose	21.5/23.5-20190326	DP05	20.0 - 25.0	4.3	N/A
			Wet at 25.0'					
28.0	745.6		Sandstone boulder embedded at 27.0'	26.5/28.5-20190326	DP06	25.0 - 30.0	5.0	N/A
			LEAN CLAY, CL, 7.5YR 4/6 (strong brown), low plasticity, firm, moist					
30.7	742.9							
			Shale, dark gray, weathered, dry		DP07	30.0 - 31.8	1.8	N/A
31.8	741.8							

Bedrock Refusal /
Bottom of Hole at 31.8 Ft.

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190326) sampled using hand auger

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG10**
Client	Tennessee Valley Authority	Boring Location	582,011.89 N; 2,407,288.66 E NAD83
Project Number	175668043	Surface Elevation	763.2 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/25/19
		Completed	3/25/19
Project Location	Harriman, Tennessee	Depth to Water	N/A
		Date/Time	N/A
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	763.2		Top of Hole						
0.5	762.7		SILT, OL, 7.5YR 3/2 (dark brown), loose, dry to moist, with organics		HA01	0.0 - 0.5		0.5	
			FAT CLAY, CH, 7.5YR 5/4 (brown), high plasticity, firm, moist		DP01	0.0 - 5.0	0.0 - 5.0	2.2	N/A
					DP02	5.0 - 10.0	5.0 - 10.0	5.0	N/A
			Coarse chert fragments embedded in clay matrix from 11.5' to 15.0'		DP03	10.0 - 15.0	10.0 - 15.0	5.0	N/A
			Chert fragments and weathered chert from 15.0' to 17.5'		DP04	15.0 - 17.5	15.0 - 17.5	3.8	N/A
			Stiff, with gravel in clay matrix at 17.5'						

HA[4] 0.0/2.2-20190325
6.5/8.5-20190325
11.5/13.5-20190325
16.5/18.5-20190325

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG10**
Client: Tennessee Valley Authority
Boring Location: 582,011.89 N; 2,407,288.66 E NAD83
Project Number: 175668043
Surface Elevation: 763.2 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
18			FAT CLAY, CH, 7.5YR 5/4 (brown), high plasticity, firm, moist *(Continued)*		DP05	17.5 - 20.0	17.5 - 20.0	2.5	N/A
19									
20				20.0/22.2-20190325					
21					DP06	20.0 - 22.2	20.0 - 22.2	2.2	N/A
22	22.2	741.0							
			Bedrock Refusal / Bottom of Hole at 22.2 Ft.						

DPT runs beyond 15.0 ft are 2.5 ft in length to allow for swelling soils. Recovery greater than run length due to swell

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190325) sampled using hand auger

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG11**
Client	Tennessee Valley Authority	Boring Location	583,551.79 N; 2,410,057.63 E NAD83
Project Number	175668043	Surface Elevation	792.1 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/21/19
		Completed	3/22/19
Project Location	Harriman, Tennessee	Depth to Water	33.0 ft
		Date/Time	3/22/19 09:33
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
Drop	N/A	Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	792.1		Top of Hole						
0			SILT, ML, 7.5YR 5/4 (brown), very dense, dry, 90% fines		HA[4] HA01	0.0 - 0.5		0.5	
1									
2				1.5/3.5-20190321	DP01	0.0 - 5.0	0.0 - 5.0	5.0	N/A
2.5	789.6								
3			FAT CLAY, CH, 7.5YR 5/4 (brown), medium plasticity, stiff, moist						
4									
5									
6					DP02	5.0 - 7.5	5.0 - 7.5	3.1	N/A
7			Coarse sand embedded from 6.5' to 7.5'	6.5/8.5-20190321					
8					DP03	7.5 - 9.0	7.5 - 9.0	2.8	N/A
9									
10									
11					DP04	10.0 - 12.5	10.0 - 12.5	3.5	N/A
12				11.5/13.5-20190321					
13									
14					DP05	12.5 - 15.0	12.5 - 15.0	3.9	N/A
15									
16			Chert lens from 16.0' to 16.4'		DP06	15.0 - 17.5	15.0 - 17.5	3.6	N/A
17			Color change to 7.5YR 5/6 (strong brown) at 17.5'	16.5/18.5-20190321					
18									
19					DP07	17.5 - 20.0	17.5 - 20.0	3.6	N/A
20			Color change to 7.5YR 4/6 (strong brown) at 20.0'						
21									

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG11**
Client: Tennessee Valley Authority
Boring Location: 583,551.79 N; 2,410,057.63 E NAD83
Project Number: 175668043
Surface Elevation: 792.1 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
21			FAT CLAY, CH, 7.5YR 5/4 (brown), medium plasticity, stiff, moist *(Continued)*	21.5/23.5-20190321	DP08	20.0 - 22.5	4.2	N/A
22								
23			Wet at 22.5'					
24					DP09	22.5 - 25.0	4.1	N/A
25								
26				26.5/28.5-20190321	DP10	25.0 - 27.5	4.1	N/A
27								
28								
29			Weathered chert lens from 28.5' to 29.3'		DP11	27.5 - 30.0	2.8	N/A
30			No chert observed from 30.0' to 32.5'					
31					DP12	30.0 - 32.5	4.5	N/A
32				31.5/33.5-20190322				
33 ▽								
34					DP13	32.5 - 35.0	3.7	N/A
35								
36					DP14	35.0 - 37.5	2.8	N/A
37	37.0	755.1	CLAYEY GRAVEL, GC, 7.5YR 5/4 (brown), coarse to cobbles, loose, wet, chert and limestone gravel	36.5/38.5-20190322				
38			Interbedded clay lenses from 37.5' to 40.0'					
39					DP15	37.5 - 40.0	2.9	N/A
40	40.0	752.1						
	40.4	751.7	Shale bedrock, refusal at 40.4'		DP16	40.0 - 40.4	0.0	N/A
			Bedrock Refusal / Bottom of Hole at 40.4 Ft.					

DPT runs beyond 5.0 ft are 2.5 ft in length to allow for swelling soils. Recovery greater than run length due to swell

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190322) sampled using hand auger

TVA EIP BORING LOG 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 12/20/19

SUBSURFACE LOG

Client Borehole ID	N/A	Stantec Boring No.	**KIF-BG12**
Client	Tennessee Valley Authority	Boring Location	584,398.52 N; 2,411,876.07 E NAD83
Project Number	175668043	Surface Elevation	798.6 ft
		Elevation Datum	NGVD29
Project Name	KIF TDEC Order	Date Started	3/27/19
		Completed	3/27/19
Project Location	Harriman, Tennessee	Depth to Water	23.5 ft
		Date/Time	3/27/19 12:57
Inspector	J. Andrew	Logger	D. Mihalek
Depth to Water	N/A	Date/Time	N/A
Drilling Contractor	Hawkston (Subcontractor)	Drill Rig Type and ID	Geoprobe 3230DT, #3230-02
Overburden Drilling and Sampling Tools (Type and Size)	DT37 Dual Tube Soil Sampling System w/ 60" PVC liners		
Rock Drilling and Sampling Tools (Type and Size)	N/A		
Overdrill Tooling (Type and Size)	N/A	Overdrill Depth	N/A
Sampler Hammer Type	GH70 Direct Push	Weight	N/A
		Drop	N/A
		Efficiency	N/A
Borehole Azimuth	N/A (Vertical)	Borehole Inclination (from Vertical)	N/A
Reviewed By	A. Blair	Approved By	L. Price

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]		Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft		Rec. Ft	Rec. %
0.0	798.6		Top of Hole						
0.5	798.1		SILT, ML, 7.5YR 4/6 (strong brown), soft, dry		HA[4] HA01	0.0 - 0.5		0.5	
			SILTY LEAN CLAY, CL, 2.5YR 4/6 (red), low plasticity, firm, moist		1.5/3.5-20190327 DP01	0.0 - 5.0	0.0 - 5.0	5.0	N/A
5.0	793.6		SILTY LEAN CLAY, CL, 5YR 4/6 (yellowish red), firm, moist		6.5/8.5-20190327 DP02	5.0 - 7.5	5.0 - 7.5	3.8	N/A
					DP03	7.5 - 10.0	7.5 - 10.0	2.7	N/A
					11.5/13.5-20190327 DP04	10.0 - 12.5	10.0 - 12.5	3.0	N/A
			Soft at 12.0'						
					DP05	12.5 - 15.0	12.5 - 15.0	2.5	N/A
			Wet at 14.5'						
					16.5/18.5-20190327 DP06	15.0 - 17.5	15.0 - 17.5	3.0	N/A
17.0	781.6								
			SILTY LEAN CLAY WITH SAND, CL, 7.5YR 5/6 (strong brown), medium plasticity, soft, wet						
18.5	780.1								
			SILTY SAND, SM, 5YR 5/6 (yellowish red), loose, wet		DP07	17.5 - 20.0	17.5 - 20.0	2.4	N/A

TVA EIP BORING LOG_175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 8/27/20

SUBSURFACE LOG

Client Borehole ID: N/A
Stantec Boring No.: **KIF-BG12**
Client: Tennessee Valley Authority
Boring Location: 584,398.52 N; 2,411,876.07 E NAD83
Project Number: 175668043
Surface Elevation: 798.6 ft
Elevation Datum: NGVD29

Lithology				Overburden:	Sample[1,2]	Depth Ft[3]	Rec. Ft	Blows/PSI
Depth Ft[3]	Elevation	Graphic	Description	Rock Core:	RQD %	Run Ft	Rec. Ft	Rec. %
21.5	777.1		SILTY SAND, SM, 5YR 5/6 (yellowish red), loose, wet *(Continued)* Fragmented shale from 20.0' to 21.5'		DP08	20.0 - 22.5	3.2	N/A
			CLAYEY SAND, SC, 10YR 3/3 (dark brown), low plasticity, loose, wet, sand/clay mix, soft					
			Color change to 10YR 6/6 (brownish yellow) at 23.5'		DP09	22.5 - 25.0	3.0	N/A
					DP10	25.0 - 27.5	4.0	N/A
			Color change to 10YR 5/6 (yellowish brown) at 27.5' With weathered sandstone and shale from 27.5' to 32.5'		DP11	27.5 - 30.0	2.8	N/A
					DP12	30.0 - 32.5	3.8	N/A
			With sandstone and shale cobbles from 32.5' to 36.5'		DP13	32.5 - 35.0	3.0	N/A
36.5	762.1				DP14	35.0 - 37.0	3.0	N/A
37.0	761.6		Limestone and Shale					
			Bedrock Refusal / Bottom of Hole at 37.0 Ft.					

21.5/23.5-20190327
26.5/28.5-20190327
31.5/33.5-20190327
35.0/37.0-20190327

20.0 - 22.5
22.5 - 25.0
25.0 - 27.5
27.5 - 30.0
30.0 - 32.5
32.5 - 35.0
35.0 - 37.0

DPT runs beyond 5.0 ft are 2.5 ft in length to allow for swelling soils. Recovery greater than run length due to swell

1: E = Environmental Sample Custody (two Split Spoons may be required to obtain sufficient sample)
G = Geotechnical Sample Custody
2: a,b,c denote Split Spoon divided between Environmental and Geotechnical Samples
3: Depths are reported in feet below ground surface
4: Grab sample (0.0/0.5-20190327) sampled using hand auger

APPENDIX D - PHOTOGRAPHIC LOGS

ATTACHMENT D.1

Photographic Logs of Soil Cores

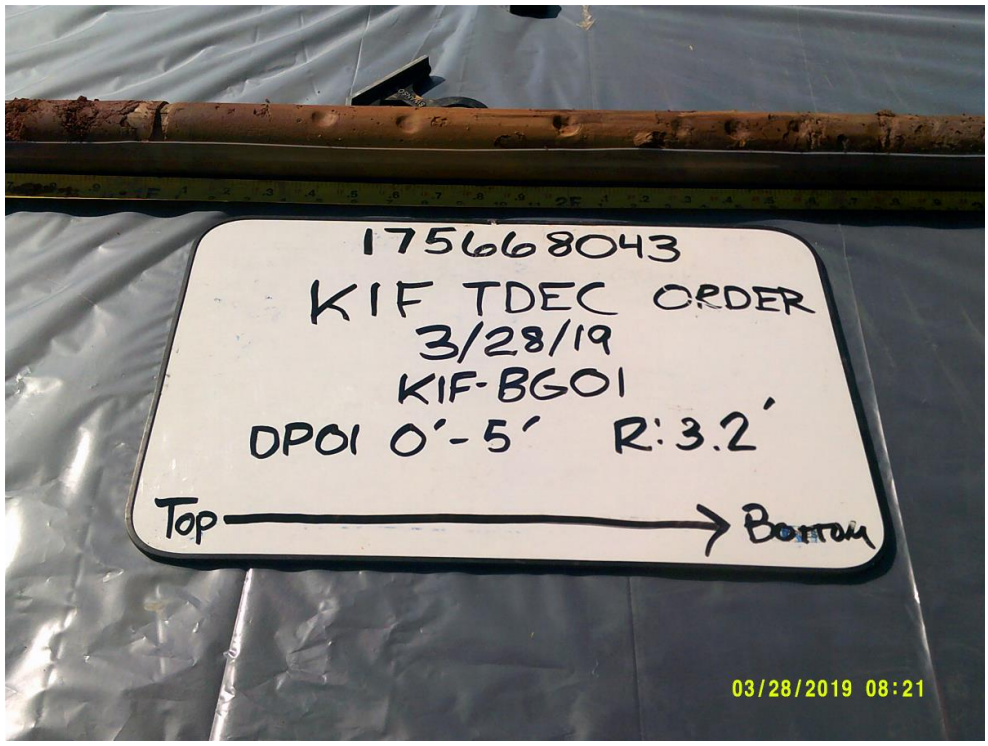
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 1

Photo Location:
KIF-BG01

Photo Date:
3/28/2019

Comments:
Interval (0.0-5.0 feet).



Photograph ID: 2

Photo Location:
KIF-BG01

Photo Date:
3/28/2019

Comments:
Interval (5.0-8.0 feet). Run number shown on whiteboard should be DP02.

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 3

Photo Location:
KIF-BG02

Photo Date:
3/14/2019

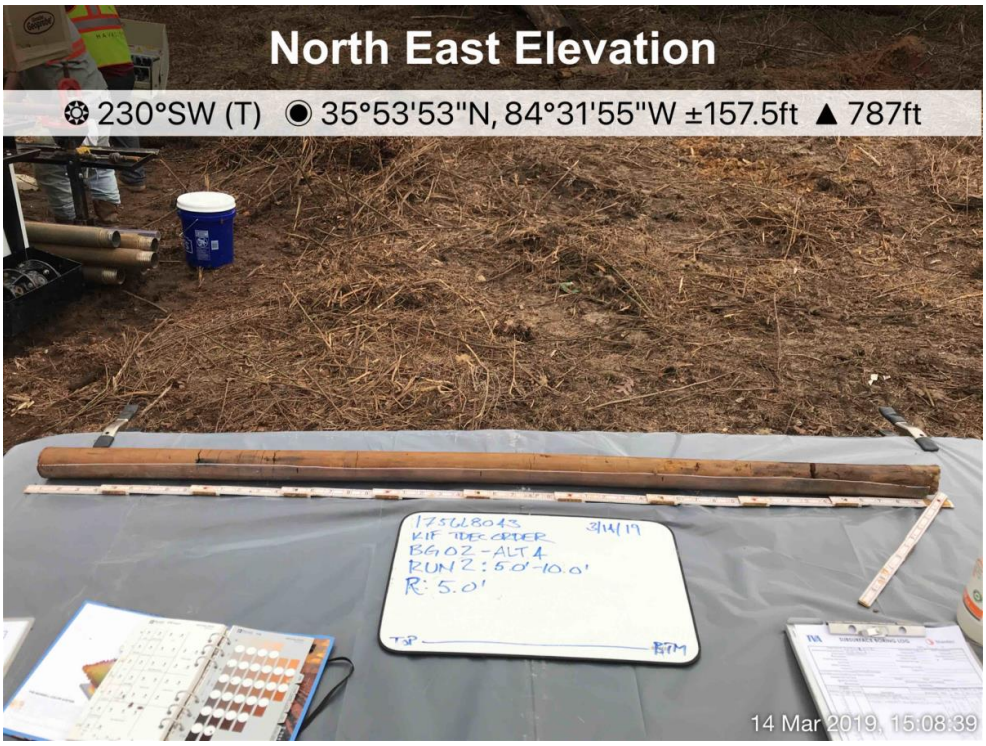
Comments:
Third boring location interval (0.0-5.0 feet).

Photograph ID: 4

Photo Location:
KIF-BG02

Photo Date:
3/14/2019

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



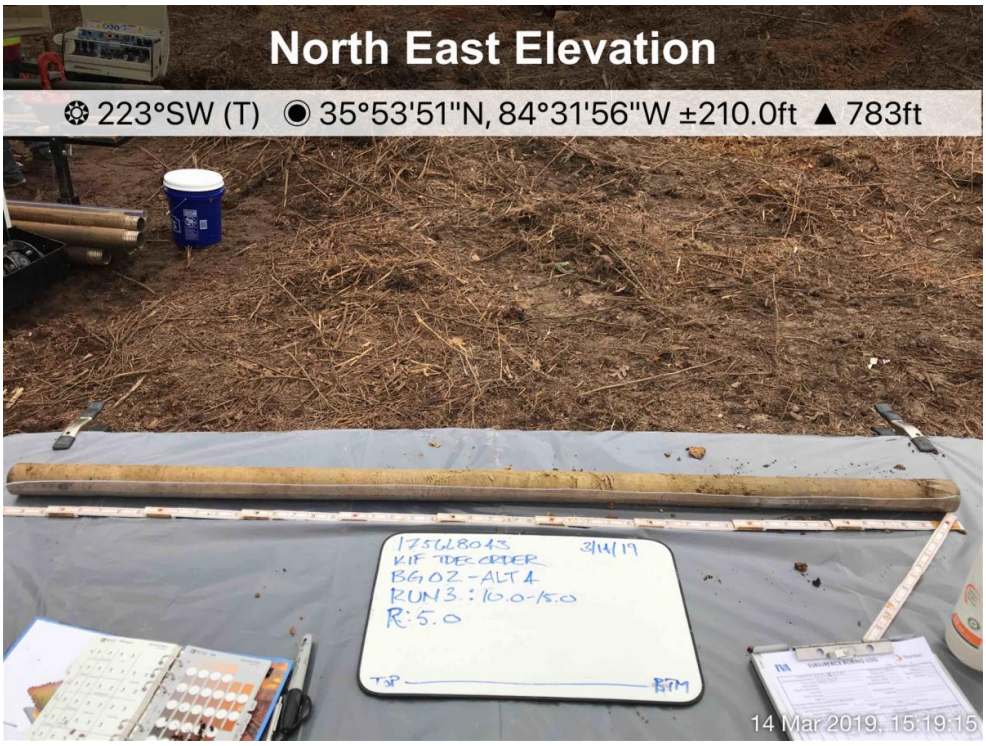
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 5

Photo Location:
KIF-BG02

Photo Date:
3/14/2019

Comments:
Third boring location interval (10.0-15.0 feet).



Photograph ID: 6

Photo Location:
KIF-BG02

Photo Date:
3/14/2019

Comments:
Photo of third boring location interval (15.0-15.5 feet) unavailable.

No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 7 **Photo Location:** KIF-BG03 **Photo Date:** 3/13/2019 **Comments:** Interval (0.0-5.0 feet).	
Photograph ID: 8 **Photo Location:** KIF-BG03 **Photo Date:** 3/13/2019 **Comments:** Interval (5.0-10.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 9 **Photo Location:** KIF-BG03 **Photo Date:** 3/13/2019 **Comments:** Interval (10.0-14.1 feet). Recovery shown on whiteboard should be 4.1.	
Photograph ID: 10 **Photo Location:** KIF-BG04 **Photo Date:** 3/19/2019 **Comments:** Photo of second boring location interval (0.0-5.0 feet) unavailable. Offset 30 feet to the west of the first boring.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 11 **Photo Location:** KIF-BG04 **Photo Date:** 3/19/2019 **Comments:** Second boring location interval (5.0-10.0 feet).	
Photograph ID: 12 **Photo Location:** KIF-BG04 **Photo Date:** 3/19/2019 **Comments:** Second boring location interval (10.0-11.1 feet). Depth range shown on whiteboard should be 10.0-11.1 feet.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 13 **Photo Location:** KIF-BG05 **Photo Date:** 3/18/2019 **Comments:** Photo of interval (0.0-5.0 feet) unavailable.	No Photo Applicable
Photograph ID: 14 **Photo Location:** KIF-BG05 **Photo Date:** 3/18/2019 **Comments:** Interval (5.0-10.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 15

Photo Location:
KIF-BG05

Photo Date:
3/18/2019

Comments:
Interval (10.0-15.0 feet).

Photograph ID: 16

Photo Location:
KIF-BG05

Photo Date:
3/18/2019

Comments:
Interval (15.0-20.0 feet).

Client:	Tennessee Valley Authority	Project:	TDEC Order
Site Name:	Kingston Fossil Plant (KIF)	Site Location:	Harriman, Tennessee

Photograph ID: 17 **Photo Location:** KIF-BG05 **Photo Date:** 3/18/2019 **Comments:** Photo of interval (20.0-25.0 feet) unavailable.	No Photo Applicable
Photograph ID: 18 **Photo Location:** KIF-BG05 **Photo Date:** 3/18/2019 **Comments:** Interval (25.0-29.3 feet). Interval shown on white board should be (25.0-29.3 feet). Run number shown on white board should be DP06. Recovery shown on white board should be 4.3.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 19

Photo Location:
KIF-BG06

Photo Date:
7/11/2019

Comments:
Interval (0.0-5.0 feet).

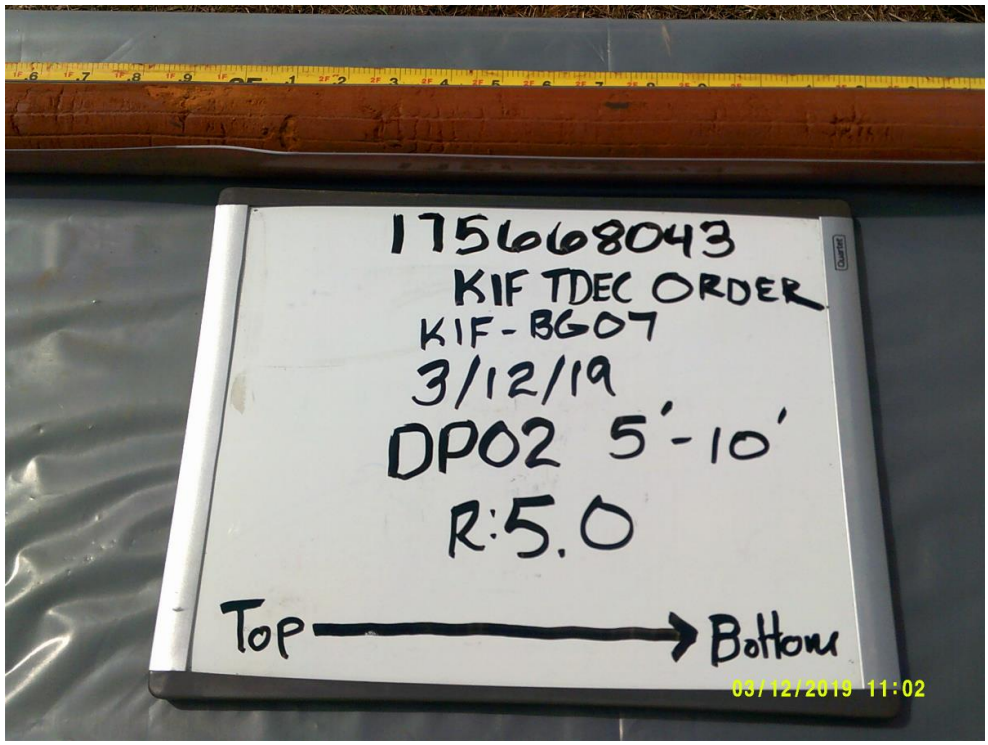
Photograph ID: 20

Photo Location:
KIF-BG06

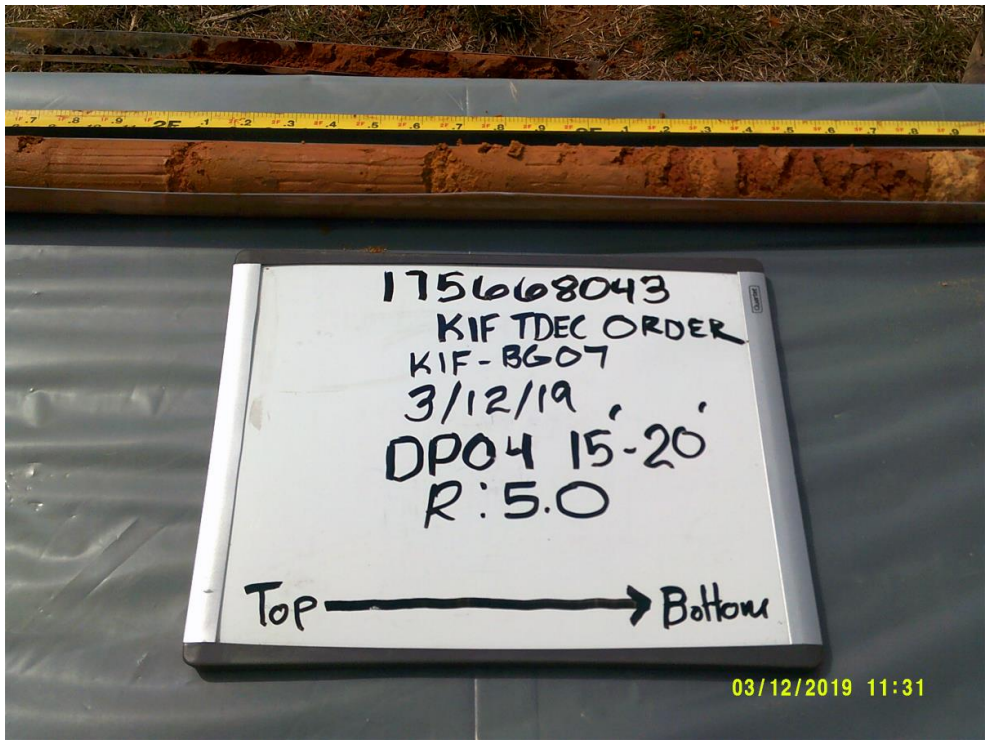
Photo Date:
7/11/2019

Comments:
Interval (5.0-9.5 feet).

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 21 **Photo Location:** KIF-BG07 **Photo Date:** 3/12/2019 **Comments:** Interval (0.0-5.0 feet).	
Photograph ID: 22 **Photo Location:** KIF-BG07 **Photo Date:** 3/12/2019 **Comments:** Interval (5.0-10.0 feet).	

Client:	Tennessee Valley Authority	Project:	TDEC Order
Site Name:	Kingston Fossil Plant (KIF)	Site Location:	Harriman, Tennessee

Photograph ID: 23 **Photo Location:** KIF-BG07 **Photo Date:** 3/12/2019 **Comments:** Photo of interval (10.0-15.0 feet) unavailable.	No Photo Applicable
Photograph ID: 24 **Photo Location:** KIF-BG07 **Photo Date:** 3/12/2019 **Comments:** Interval (15.0-20.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 25 **Photo Location:** KIF-BG07 **Photo Date:** 3/12/2019 **Comments:** Interval (20.0-25.0 feet).	
Photograph ID: 26 **Photo Location:** KIF-BG07 **Photo Date:** 3/12/2019 **Comments:** Interval (25.0-30.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 27

Photo Location:
KIF-BG07

Photo Date:
3/12/2019

Comments:
Interval (30.0-35.0 feet).

Photograph ID: 28

Photo Location:
KIF-BG07

Photo Date:
3/12/2019

Comments:
Interval (35.0-40.0 feet). Boring ID on whiteboard should be KIF-BG07. Date shown on whiteboard should be 03/12/2019.

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 29

Photo Location:
KIF-BG07

Photo Date:
3/12/2019

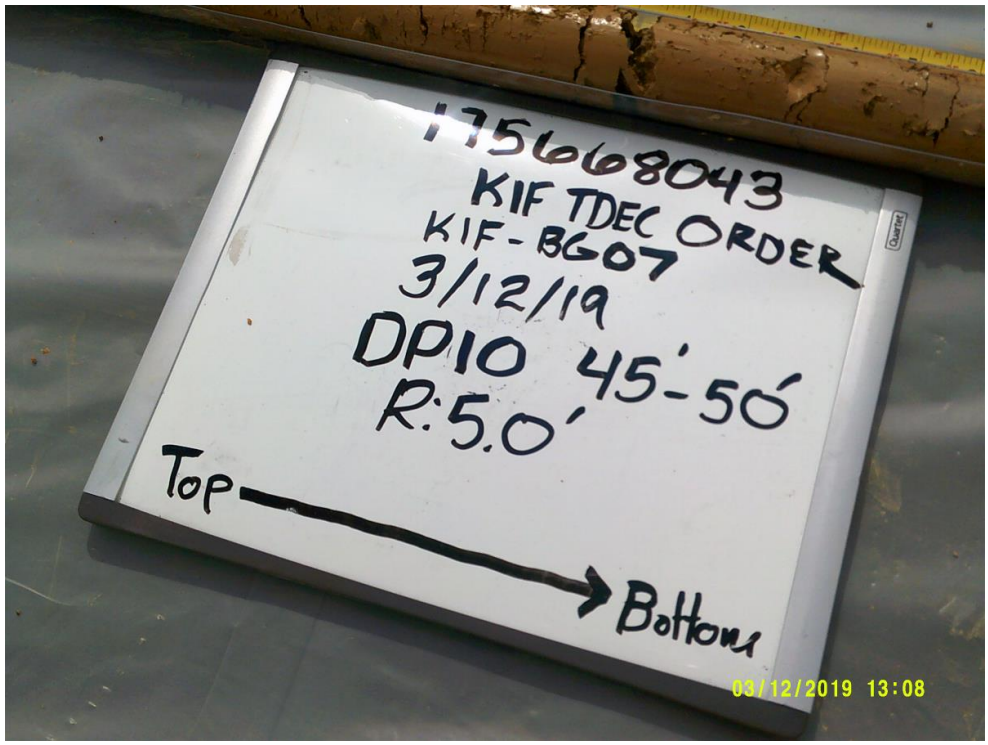
Comments:
Interval (40.0-45.0 feet).

Photograph ID: 30

Photo Location:
KIF-BG07

Photo Date:
3/12/2019

Comments:
Interval (45.0-50.0 feet).



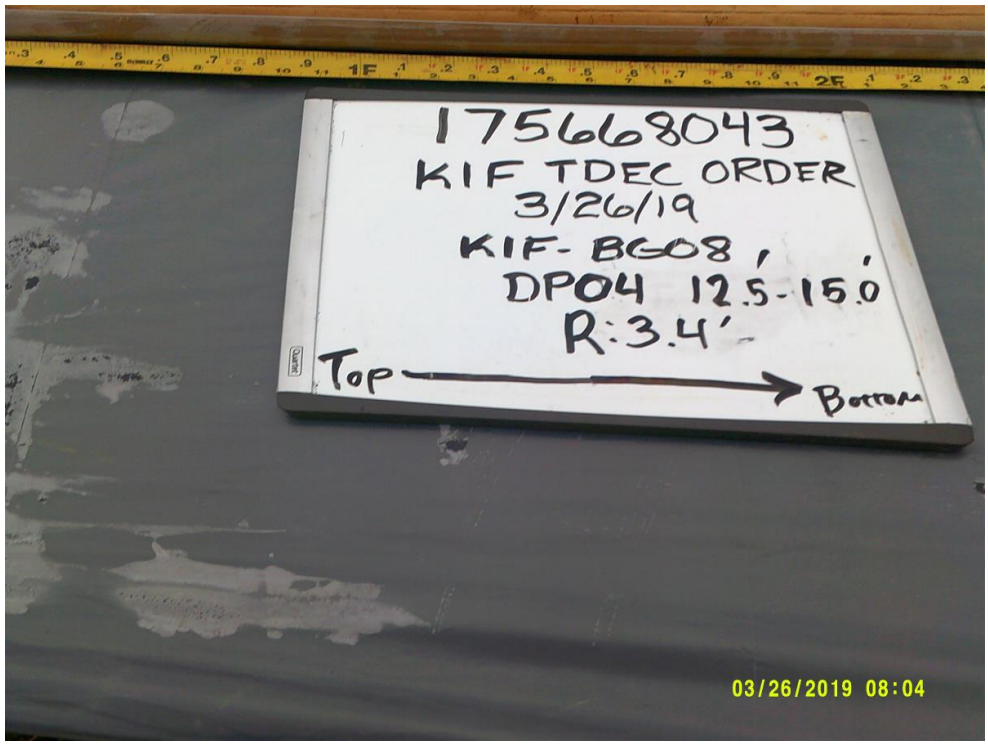
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 31 **Photo Location:** KIF-BG07 **Photo Date:** 3/12/2019 **Comments:** Interval (50.0-53.5 feet).	
Photograph ID: 32 **Photo Location:** KIF-BG08 **Photo Date:** 3/26/2019 **Comments:** Photo of interval (0.0-5.0 feet) unavailable.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 33 **Photo Location:** KIF-BG08 **Photo Date:** 3/26/2019 **Comments:** Interval (5.0-10.0 feet).	
Photograph ID: 34 **Photo Location:** KIF-BG08 **Photo Date:** 3/26/2019 **Comments:** Photo of interval (10.0-12.5 feet) unavailable.	No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 35 **Photo Location:** KIF-BG08 **Photo Date:** 3/26/2019 **Comments:** Interval (12.5-15.0 feet).	
Photograph ID: 36 **Photo Location:** KIF-BG08 **Photo Date:** 3/26/2019 **Comments:** Interval (15.0-17.5 feet).	

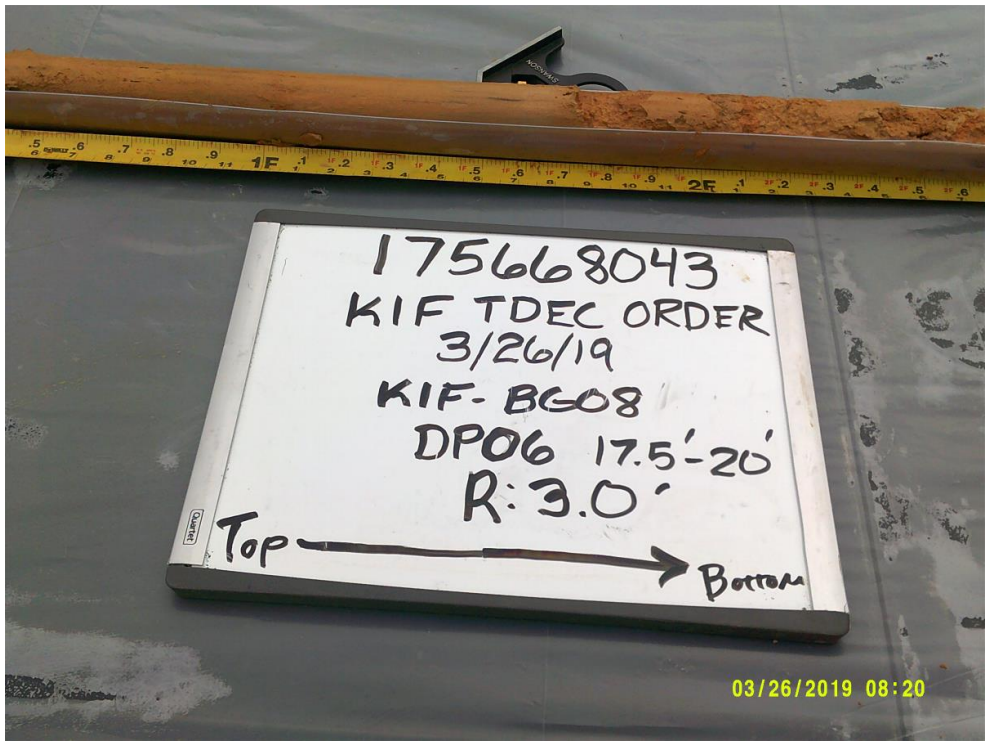
Client:	Tennessee Valley Authority	Project:	TDEC Order
Site Name:	Kingston Fossil Plant (KIF)	Site Location:	Harriman, Tennessee

Photograph ID: 37

Photo Location:
KIF-BG08

Photo Date:
3/26/2019

Comments:
Interval (17.5-20.0 feet).



Photograph ID: 38

Photo Location:
KIF-BG08

Photo Date:
3/26/2019

Comments:
Interval (20.0-22.5 feet).

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 39

Photo Location:
KIF-BG08

Photo Date:
3/26/2019

Comments:
Interval (22.5-25.0 feet).

Photograph ID: 40

Photo Location:
KIF-BG08

Photo Date:
3/26/2019

Comments:
Photo of interval (25.0-27.5 feet) unavailable.

No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 41 **Photo Location:** KIF-BG09 **Photo Date:** 3/26/2019 **Comments:** Interval (0.0-5.0 feet). Run number shown on white board should be DP01.	
Photograph ID: 42 **Photo Location:** KIF-BG09 **Photo Date:** 3/26/2019 **Comments:** Interval (5.0-10.0 feet). Run number shown on white board should be DP02.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 43 **Photo Location:** KIF-BG09 **Photo Date:** 3/26/2019 **Comments:** Interval (10.0-15.0 feet). Run number shown on white board should be DP03.	
Photograph ID: 44 **Photo Location:** KIF-BG09 **Photo Date:** 3/26/2019 **Comments:** Interval (15.0-20.0 feet). Run number shown on white board should be DP04.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 45

Photo Location:
KIF-BG09

Photo Date:
3/26/2019

Comments:
Interval (20.0-25.0 feet).

Photograph ID: 46

Photo Location:
KIF-BG09

Photo Date:
3/26/2019

Comments:
Interval (25.0-30.0 feet).

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 47

Photo Location:
KIF-BG09

Photo Date:
3/26/2019

Comments:
Interval (30.0-31.8 feet).

Photograph ID: 48

Photo Location:
KIF-BG10

Photo Date:
3/25/2019

Comments:
Interval (0.0-5.0 feet).

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 49 **Photo Location:** KIF-BG10 **Photo Date:** 3/25/2019 **Comments:** Interval (5.0-10.0 feet).	
Photograph ID: 50 **Photo Location:** KIF-BG10 **Photo Date:** 3/25/2019 **Comments:** Interval (10.0-15.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 51 **Photo Location:** KIF-BG10 **Photo Date:** 3/25/2019 **Comments:** Photo of interval (15.0-17.5 feet) unavailable.	No Photo Applicable
Photograph ID: 52 **Photo Location:** KIF-BG10 **Photo Date:** 3/25/2019 **Comments:** Interval (17.5-20.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 53

Photo Location:
KIF-BG10

Photo Date:
3/25/2019

Comments:
Interval (20.0-22.2 feet).

Photograph ID: 54

Photo Location:
KIF-BG11

Photo Date:
3/21/2019

Comments:
Third boring location interval (0.0-5.0 feet). Project number shown on whiteboard should be 175668043.

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 55 **Photo Location:** KIF-BG11 **Photo Date:** 3/21/2019 **Comments:** Photo of third boring location interval (5.0-7.5 feet) unavailable.	No Photo Applicable
Photograph ID: 56 **Photo Location:** KIF-BG11 **Photo Date:** 3/21/2019 **Comments:** Third boring location interval (7.5-9.0 feet). Project number shown on whiteboard should be 175668043.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 57

Photo Location:
KIF-BG11

Photo Date:
3/21/2019

Comments:
Third boring location interval (10.0-12.5 feet). Project number shown on whiteboard should be 175668043.

Photograph ID: 58

Photo Location:
KIF-BG11

Photo Date:
3/21/2019

Comments:
Photo of third boring location interval (12.5-15.0 feet) unavailable.

No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 59

Photo Location:
KIF-BG11

Photo Date:
3/21/2019

Comments:
Third boring location interval (15.0-17.5 feet). Project number shown on whiteboard should be 175668043.

Photograph ID: 60

Photo Location:
KIF-BG11

Photo Date:
3/21/2019

Comments:
Third boring location interval (17.5-20.0 feet). Project number shown on whiteboard should be 175668043.

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 61 **Photo Location:** KIF-BG11 **Photo Date:** 3/21/2019 **Comments:** Third boring location interval (20.0-22.5 feet). Project number shown on whiteboard should be 175668043.	
Photograph ID: 62 **Photo Location:** KIF-BG11 **Photo Date:** 3/21/2019 **Comments:** Third boring location interval (22.5-25.0 feet). Project number shown on whiteboard should be 175668043.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 63

Photo Location:
KIF-BG11

Photo Date:
3/21/2019

Comments:
Third boring location interval (25.0-27.5 feet). Project number shown on whiteboard should be 175668043. End depth shown on whiteboard should be 27.5.

Photograph ID: 64

Photo Location:
KIF-BG11

Photo Date:
3/21/2019

Comments:
Third boring location interval (27.5-30.0 feet). Project number shown on whiteboard should be 175668043. Run number shown on white board should be DP11.

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 65

Photo Location:
KIF-BG11

Photo Date:
3/21/2019

Comments:
Third boring location interval (30.0-32.5 feet). Project number shown on whiteboard should be 175668043.

Photograph ID: 66

Photo Location:
KIF-BG11

Photo Date:
3/22/2019

Comments:
Third boring location interval (32.5-35.0 feet).

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 67

Photo Location:
KIF-BG11

Photo Date:
3/22/2019

Comments:
Third boring location interval (35.0-37.5 feet).

Photograph ID: 68

Photo Location:
KIF-BG11

Photo Date:
3/22/2019

Comments:
Photo of third boring location interval (37.5-40.0 feet) unavailable.

No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 69 **Photo Location:** KIF-BG11 **Photo Date:** 3/22/2019 **Comments:** Third boring location interval (40.0-40.4 feet) no recovery, photo unavailable.	No Photo Applicable
Photograph ID: 70 **Photo Location:** KIF-BG12 **Photo Date:** 3/27/2019 **Comments:** Interval (0.0-5.0 feet).	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 71

Photo Location:
KIF-BG12

Photo Date:
3/27/2019

Comments:
Interval (5.0-7.5 feet). End depth shown on whiteboard should be 7.5.

Photograph ID: 72

Photo Location:
KIF-BG12

Photo Date:
3/27/2019

Comments:
Photo of interval (7.5-10.0 feet) unavailable.

No Photo Applicable

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 73

Photo Location:
KIF-BG12

Photo Date:
3/27/2019

Comments:
Interval (10.0-12.5 feet).

Photograph ID: 74

Photo Location:
KIF-BG12

Photo Date:
3/27/2019

Comments:
Interval (12.5-15.0 feet).

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 75 **Photo Location:** KIF-BG12 **Photo Date:** 3/27/2019 **Comments:** Interval (15.0-17.5 feet).	
Photograph ID: 76 **Photo Location:** KIF-BG12 **Photo Date:** 3/27/2019 **Comments:** Interval (17.5-20.0 feet). Run number shown on whiteboard should be DP07.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 77

Photo Location:
KIF-BG12

Photo Date:
3/27/2019

Comments:
Interval (20.0-22.5 feet).

Photograph ID: 78

Photo Location:
KIF-BG12

Photo Date:
3/27/2019

Comments:
Interval (22.5-25.0 feet). Run number shown on whiteboard should be DP09.

Client:	Tennessee Valley Authority	Project:	TDEC Order
Site Name:	Kingston Fossil Plant (KIF)	Site Location:	Harriman, Tennessee

Photograph ID: 79

Photo Location:
KIF-BG12

Photo Date:
3/27/2019

Comments:
Interval (25.0-27.5 feet). Run number shown on whiteboard should be DP10.

Photograph ID: 80

Photo Location:
KIF-BG12

Photo Date:
3/27/2019

Comments:
Interval (27.5-30.0 feet). Run number shown on whiteboard should be DP11.

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 81 **Photo Location:** KIF-BG12 **Photo Date:** 3/27/2019 **Comments:** Interval (30.0-32.5 feet). Run number shown on whiteboard should be DP12.	
Photograph ID: 82 **Photo Location:** KIF-BG12 **Photo Date:** 3/27/2019 **Comments:** Interval (32.5-35.0 feet). Run number shown on whiteboard should be DP13.	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 83

Photo Location:
KIF-BG12

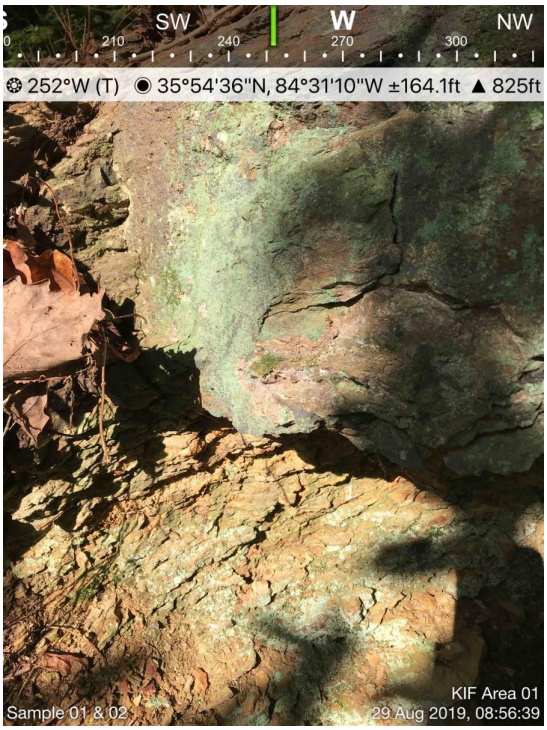
Photo Date:
3/27/2019

Comments:
Interval (35.0-37.0 feet). Run number shown on whiteboard should be DP14.

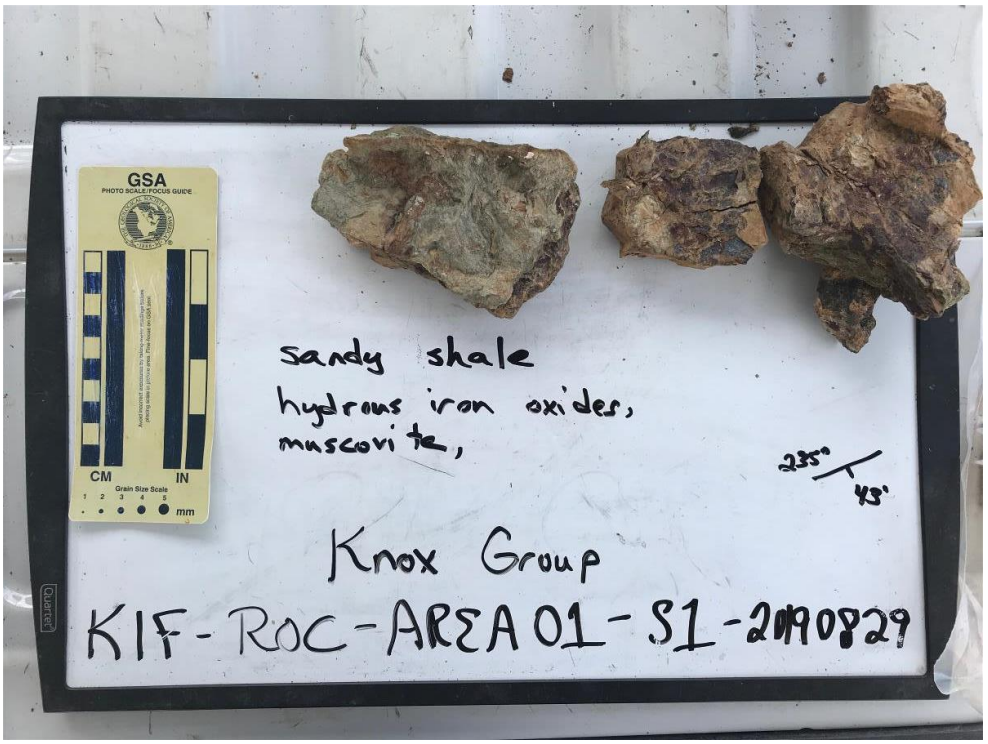
ATTACHMENT D.2

Photographic Logs of Rock Outcrops

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 1 **Photo Location:** Area 01 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA01-01. Geologic formation shown on whiteboard should be Conasauga Shale, not Knox. Strike and dip should read N55°E, 43°SE	
Photograph ID: 2 **Photo Location:** Area 01 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA01-01	

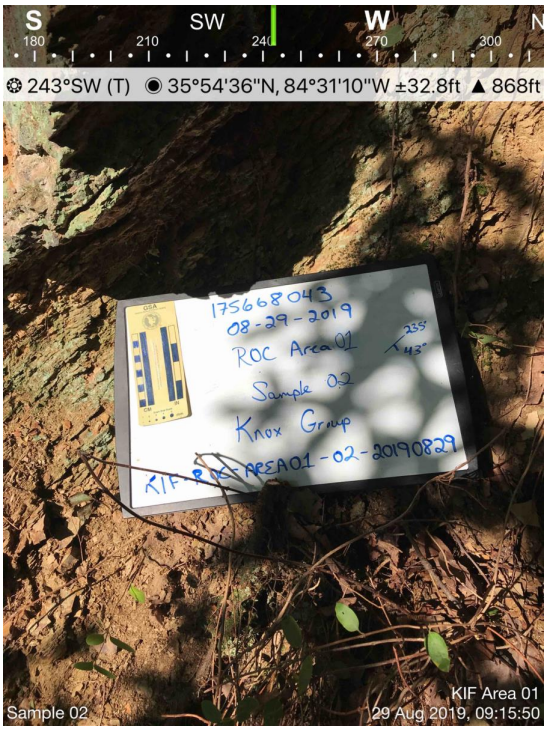
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 3 **Photo Location:** Area 01 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA01-01. Geologic formation shown on whiteboard should be Conasauga Shale, not Knox. Strike and dip should read N55°E, 43°SE	
Photograph ID: 4 **Photo Location:** Area 01 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA01-01. Geologic formation shown on whiteboard should be Conasauga Shale, not Knox. Strike and dip should read N55°E, 43°SE	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 5 **Photo Location:** Area 01 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA01-01	
Photograph ID: 6 **Photo Location:** Area 01 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA01-01	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 7 **Photo Location:** Area 01 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA01-01	
Photograph ID: 8 **Photo Location:** Area 01 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA01-02. Geologic formation shown on whiteboard should be Conasauga Shale, not Knox. Strike and dip should read N55°E, 43°SE	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

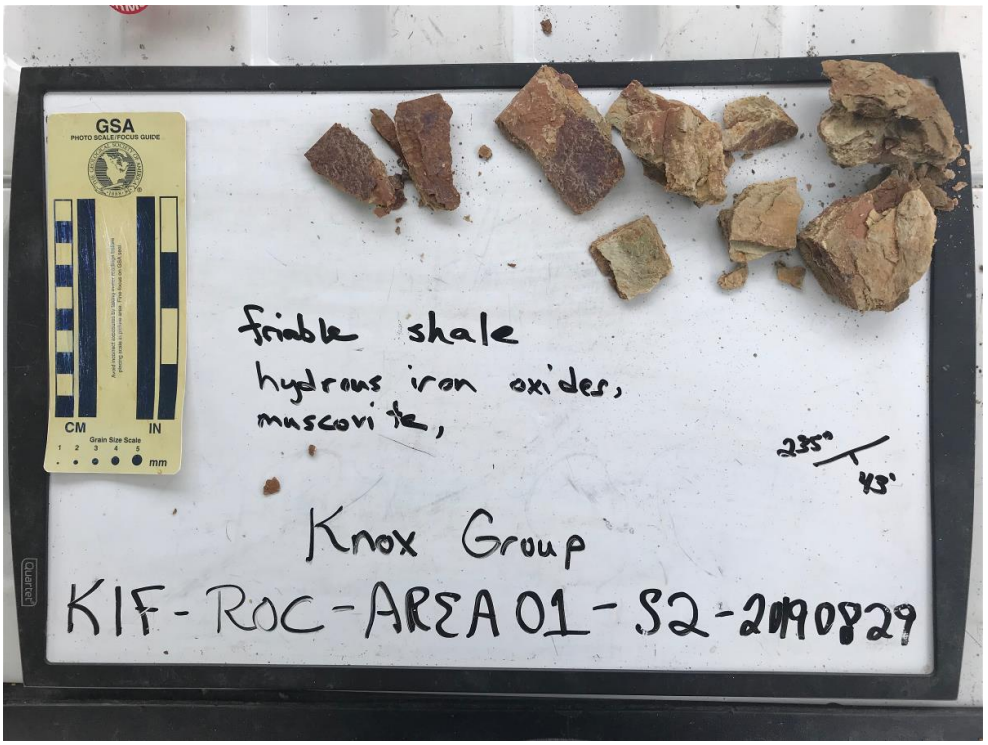
Photograph ID: 9

Photo Location:
Area 01

Direction::

Photo Date:
9/6/2019

Comments:
KIF-ROC-AREA01-02. Geologic formation shown on whiteboard should be Conasauga Shale, not Knox. Strike and dip should read N55°E, 43°SE



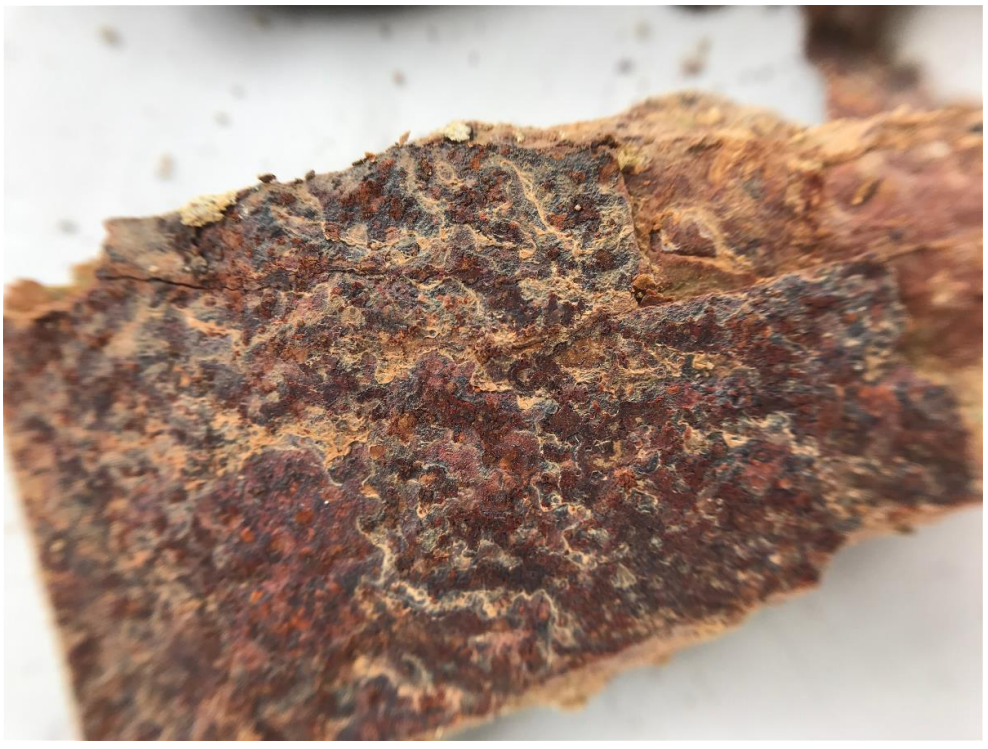
Photograph ID: 10

Photo Location:
Area 01

Direction::

Photo Date:
9/6/2019

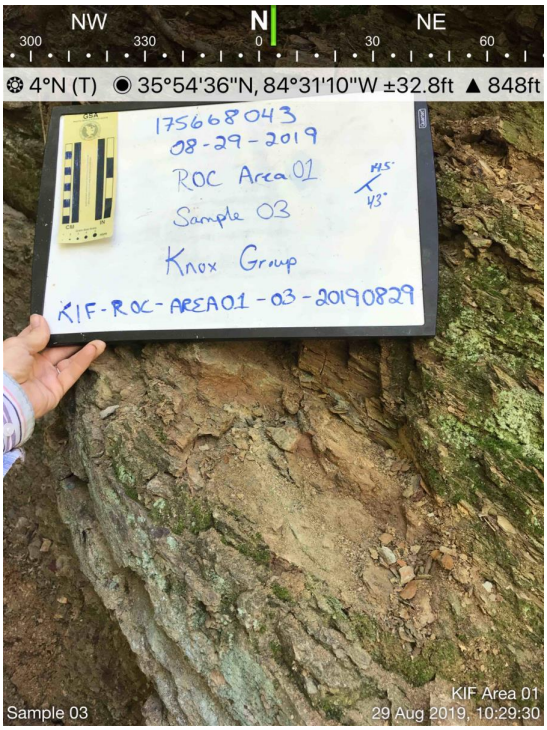
Comments:
KIF-ROC-AREA01-02



Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 11 **Photo Location:** Area 01 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA01-02	
Photograph ID: 12 **Photo Location:** Area 01 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA01-02	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 13 **Photo Location:** Area 01 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA01-02	
Photograph ID: 14 **Photo Location:** Area 01 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA01-03. Geologic formation shown on whiteboard should be Conasauga Shale, not Knox. Strike and dip should read N35°E, 43°SE	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

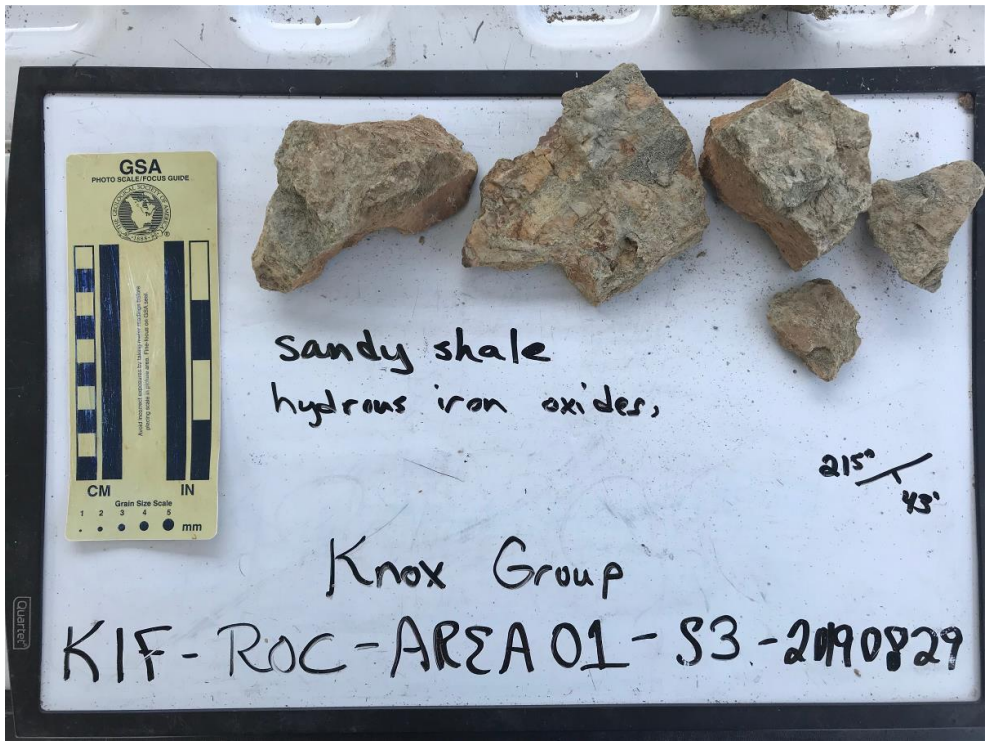
Photograph ID: 15

Photo Location:
Area 01

Direction::

Photo Date:
9/6/2019

Comments:
KIF-ROC-AREA01-03. Strike and dip should read N35°E, 43°SE



Photograph ID: 16

Photo Location:
Area 01

Direction::

Photo Date:
9/6/2019

Comments:
KIF-ROC-AREA01-03

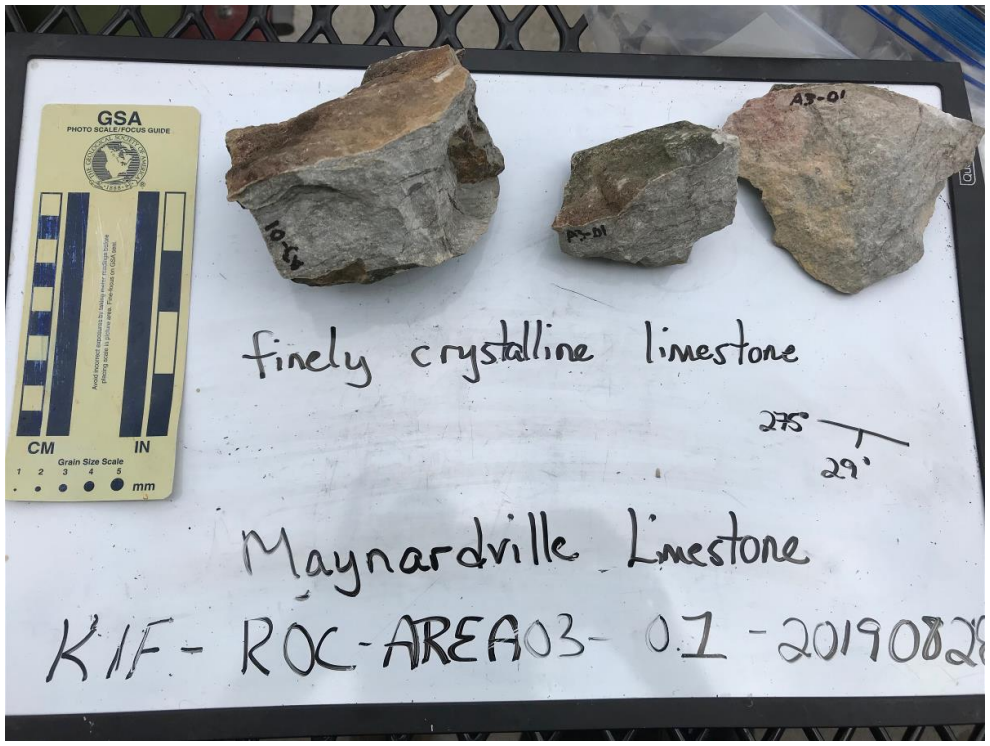
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 17 **Photo Location:** Area 02 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA02-01. Geologic formation shown on whiteboard should be Conasauga Shale, not Knox. Strike and dip should read N70°E, 32°SE	
Photograph ID: 18 **Photo Location:** Area 02 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA02-01. Strike and dip should read N70°E, 32°SE	

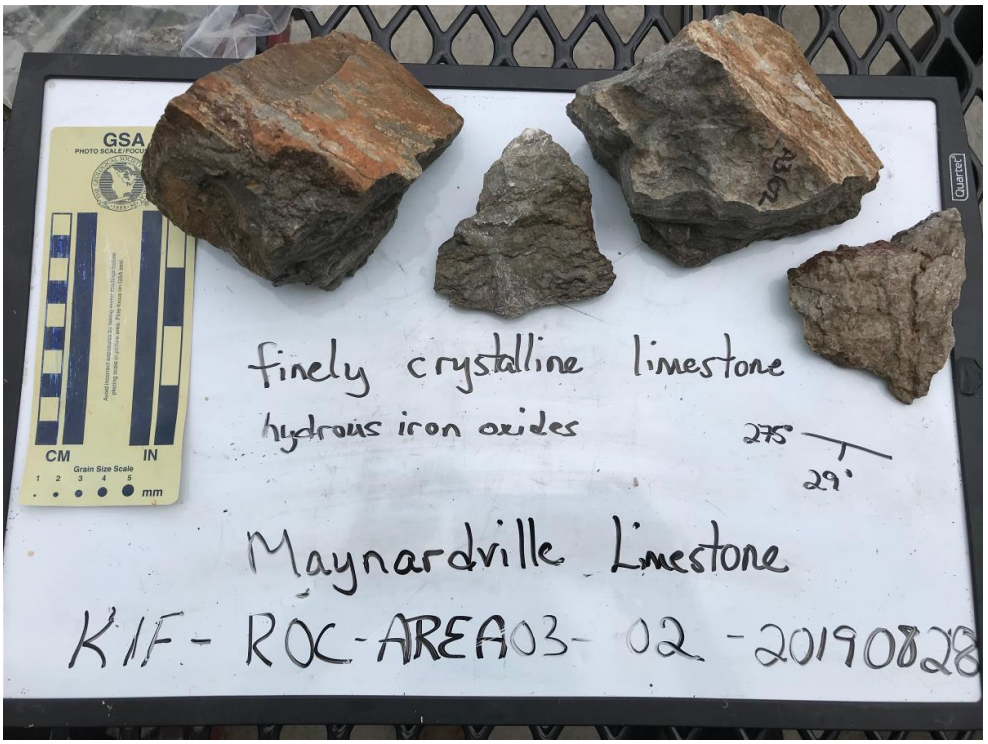
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 19 **Photo Location:** Area 02 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA02-01	
Photograph ID: 20 **Photo Location:** Area 03 **Direction::** **Photo Date:** 8/28/2019 **Comments:** KIF-ROC-AREA03-01. Strike and dip should read N85°E, 29°SE	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 21 **Photo Location:** Area 03 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA03-01. Strike and dip should read N85°E, 29°SE	
Photograph ID: 22 **Photo Location:** Area 03 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA03-01	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 23 **Photo Location:** Area 03 **Direction::** **Photo Date:** 8/28/2019 **Comments:** KIF-ROC-AREA03-02. Strike and dip should read N75°E, 25°SE	
Photograph ID: 24 **Photo Location:** Area 03 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA03-02. Strike and dip should read N75°E, 25°SE	

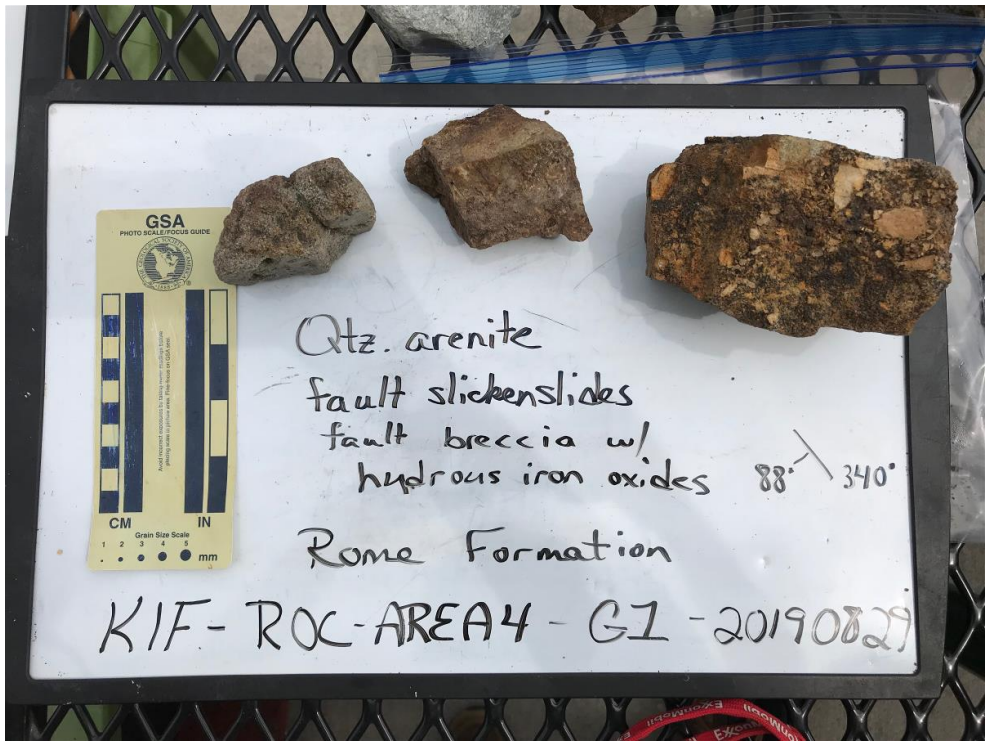
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 25 **Photo Location:** Area 03 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA03-02	
Photograph ID: 26 **Photo Location:** Area 03 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA03-02	

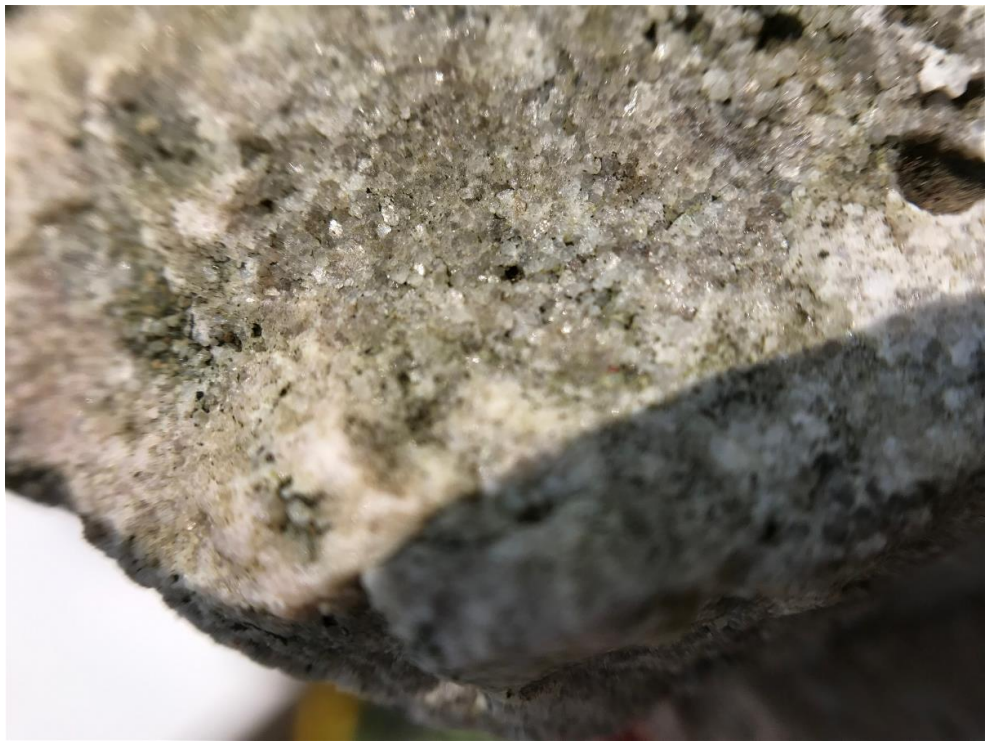
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 27 **Photo Location:** Area 03 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA03-02	
Photograph ID: 28 **Photo Location:** Area 04 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA04-G01	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 29 **Photo Location:** Area 04 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA04-G01. After additional evaluation it has been concluded that the strike and dip measurements recorded here were most likely not taken from a representative surface. Fault breccia observed.	
Photograph ID: 30 **Photo Location:** Area 04 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA04-G01	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 31 **Photo Location:** Area 04 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA04-G01	
Photograph ID: 32 **Photo Location:** Area 04 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA04-G01	

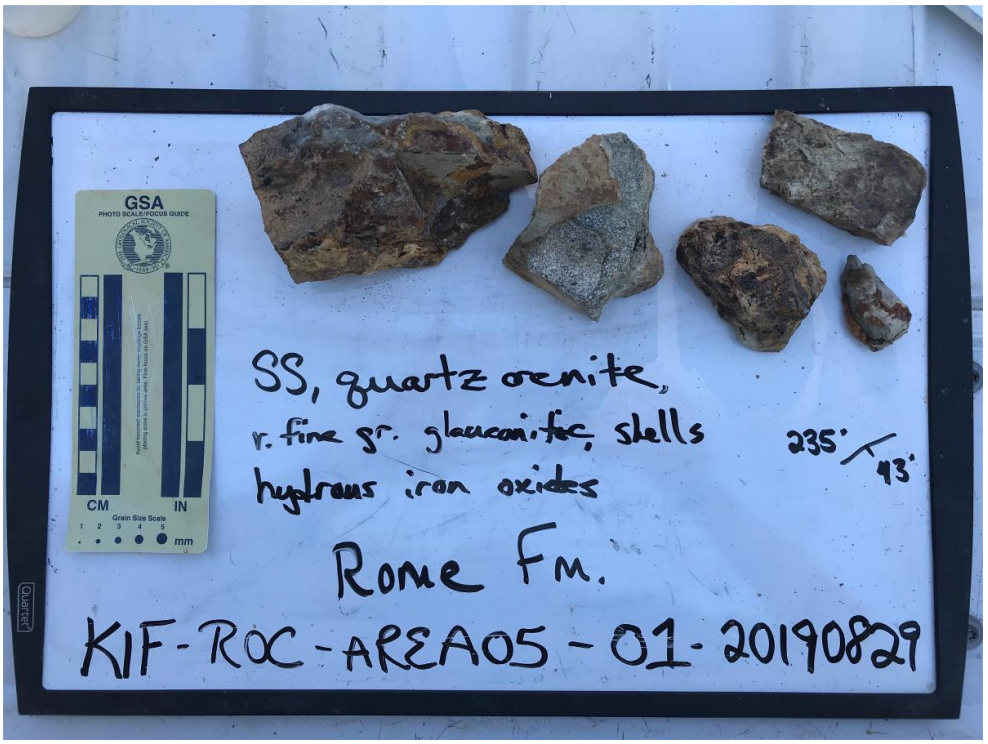
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 33 **Photo Location:** Area 04 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA04-G01	
Photograph ID: 34 **Photo Location:** Area 04 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA04-G01	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 35 **Photo Location:** Area 04 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA04-G01	
Photograph ID: 36 **Photo Location:** Area 04 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA04-G01	

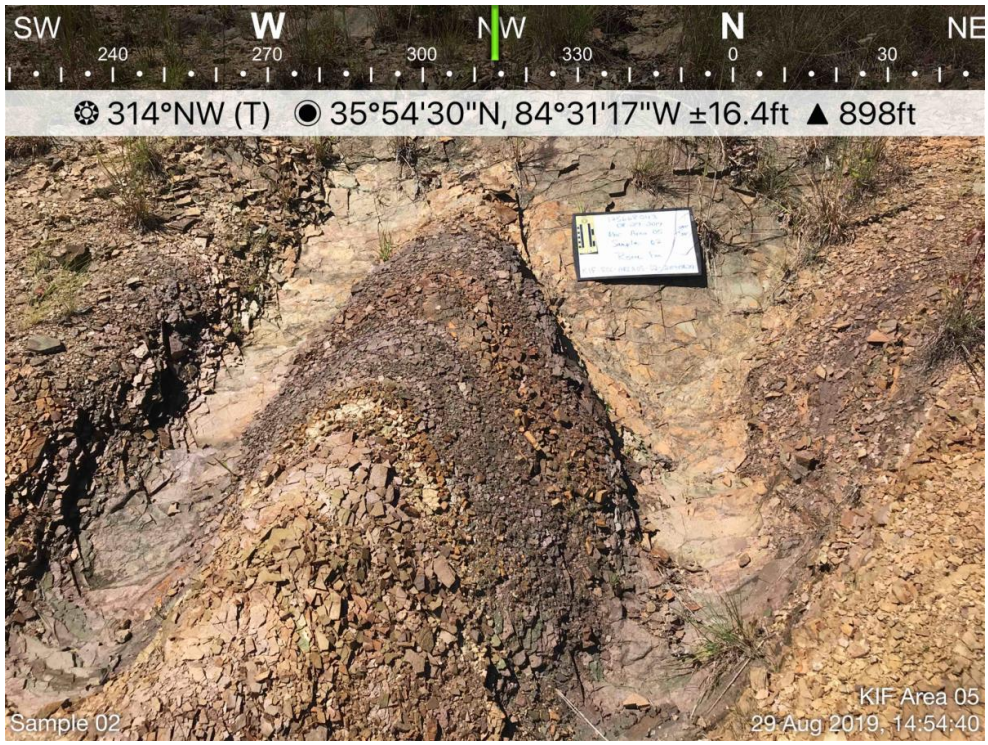
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 37 **Photo Location:** Area 05 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA05-01. Geologic formation shown on whiteboard should be Conasauga Shale near contact with Rome Formation, not simply Rome. Strike and dip should read N55°E, 43°SE	
Photograph ID: 38 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-01. Geologic formation shown on whiteboard should be Conasauga Shale near contact with Rome Formation, not simply Rome. Strike and dip should read N55°E, 43°SE	

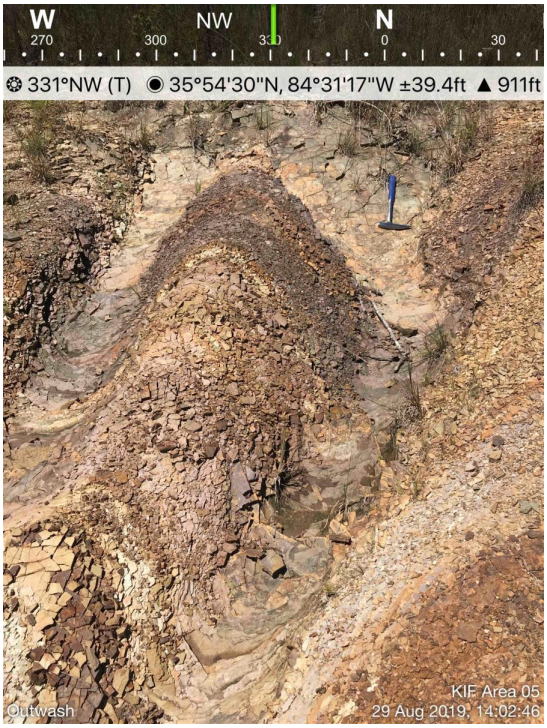
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 39 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-01	
Photograph ID: 40 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-01	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 41 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-01	
Photograph ID: 42 **Photo Location:** Area 05 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA05-02. Geologic formation shown on whiteboard should be Conasauga Shale near contact with Rome Formation, not simply Rome. Strike and dip should read N64°E, 34°SE	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 43 **Photo Location:** Area 05 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA05-02	
Photograph ID: 44 **Photo Location:** Area 05 **Direction::** **Photo Date:** 8/29/2019 **Comments:** KIF-ROC-AREA05-02. Geologic formation shown on whiteboard should be Conasauga Shale near contact with Rome Formation, not simply Rome. Strike and dip should read N64°E, 34°SE	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

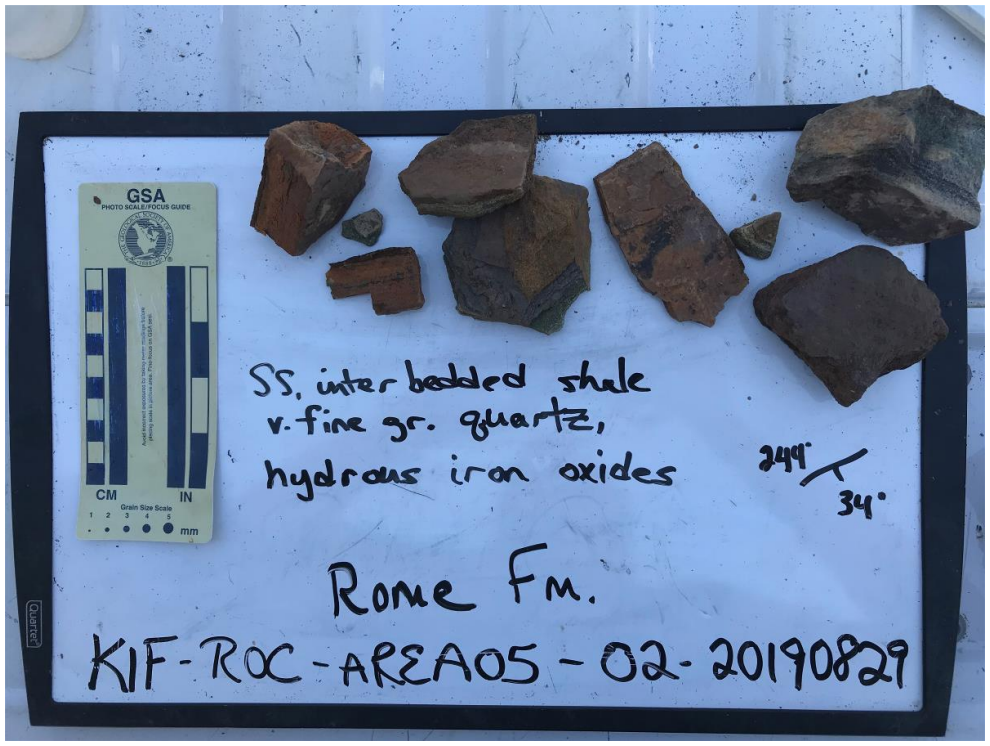
Photograph ID: 45

Photo Location:
Area 05

Direction::

Photo Date:
9/6/2019

Comments:
KIF-ROC-AREA05-02. Geologic formation shown on whiteboard should be Conasauga Shale near contact with Rome Formation, not simply Rome. Strike and dip should read N64°E, 34°SE



Photograph ID: 46

Photo Location:
Area 05

Direction::

Photo Date:
9/6/2019

Comments:
KIF-ROC-AREA05-02

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 47 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-02	
Photograph ID: 48 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-02	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

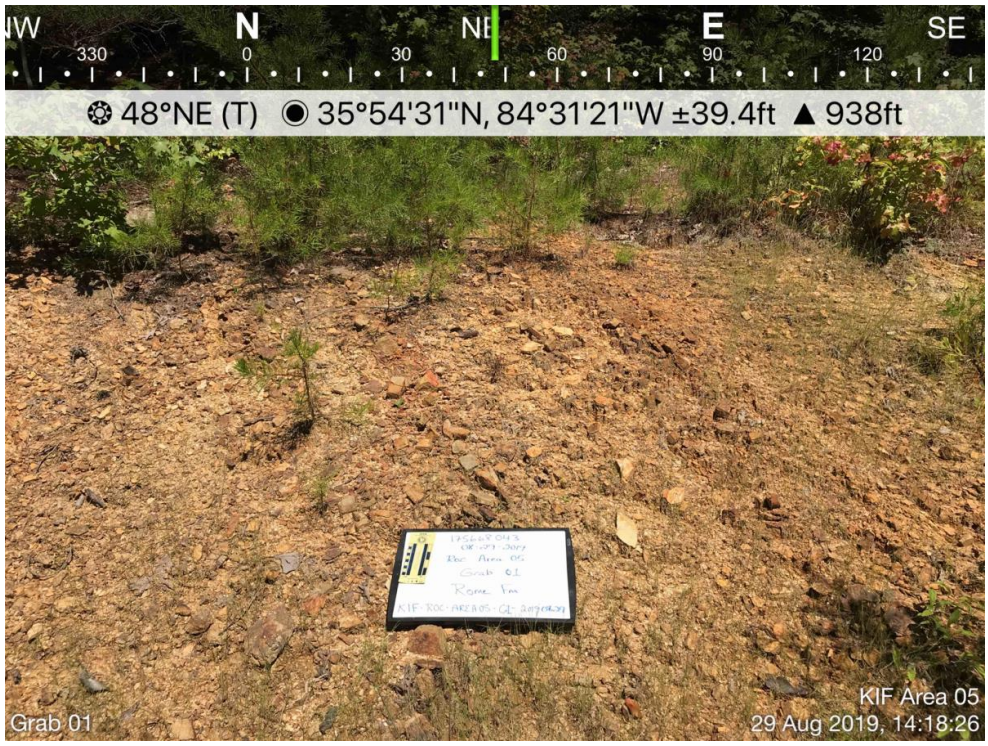
Photograph ID: 49

Photo Location:
Area 05

Direction::

Photo Date:
8/29/2019

Comments:
KIF-ROC-AREA05-G01



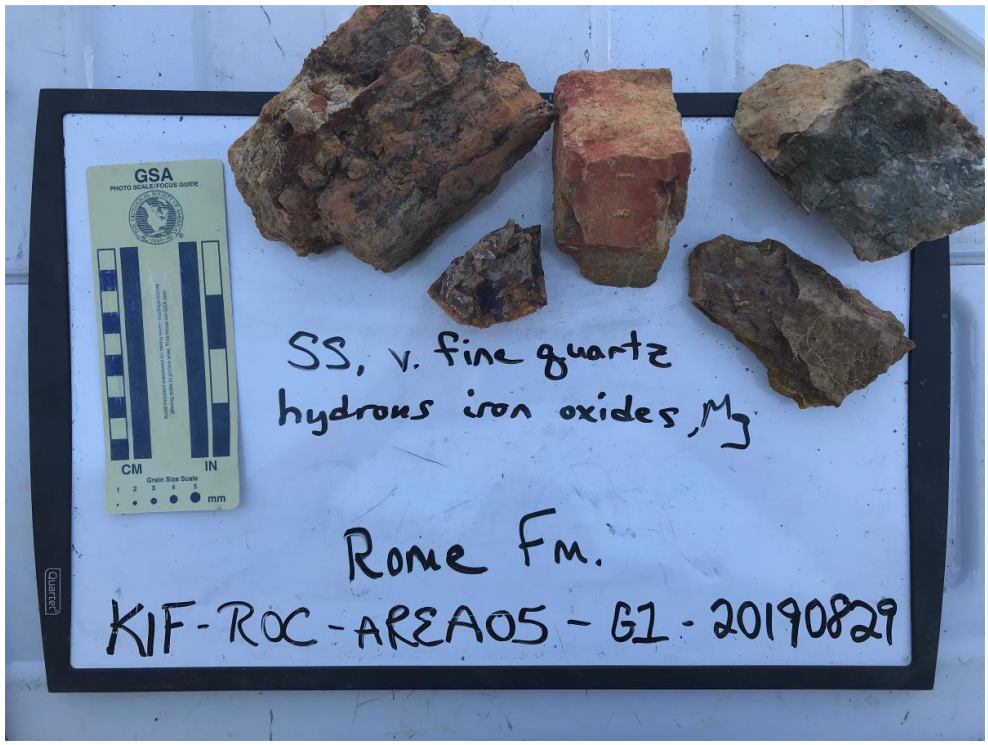
Photograph ID: 50

Photo Location:
Area 05

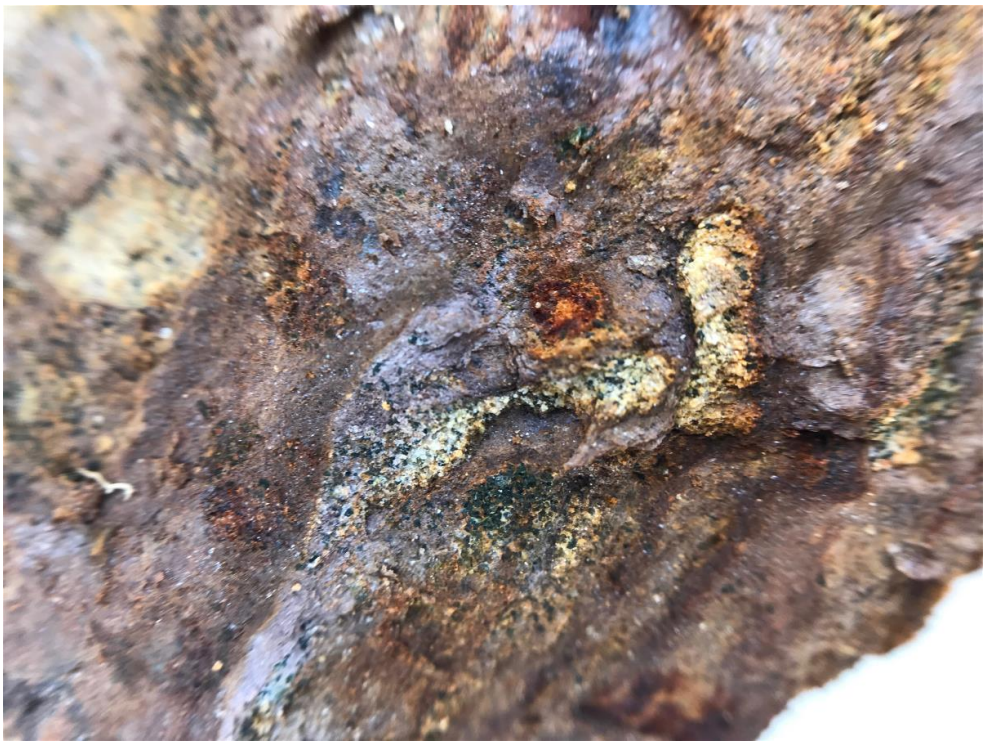
Direction::

Photo Date:
9/6/2019

Comments:
KIF-ROC-AREA05-G01



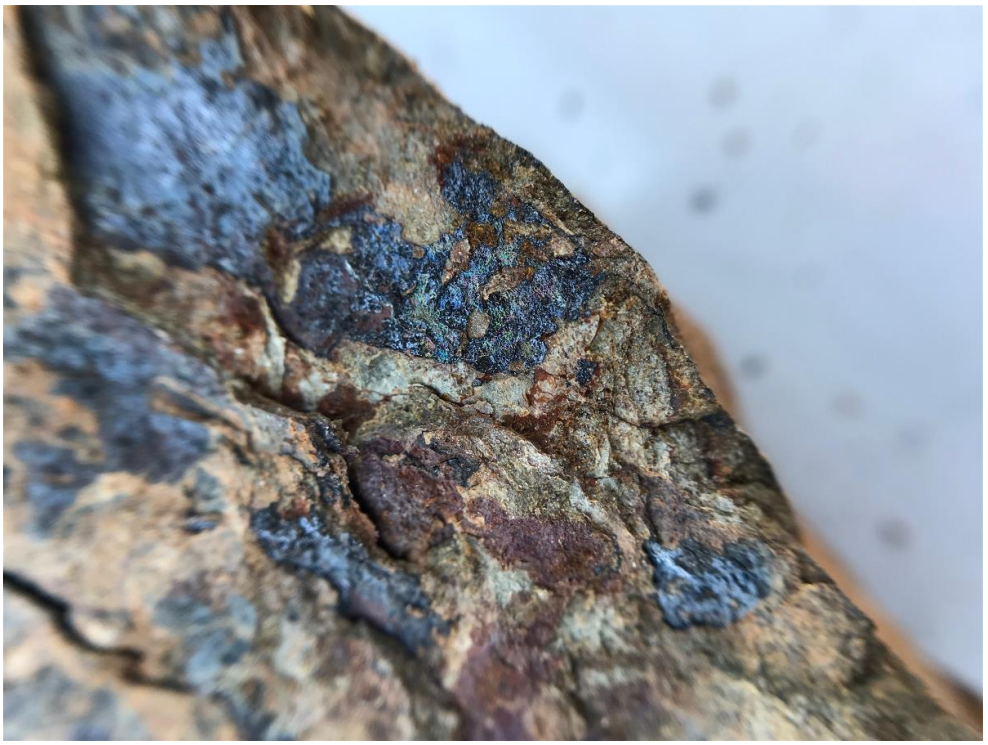
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 51 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-G01	
Photograph ID: 52 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-G01	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 53 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-G01	
Photograph ID: 54 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-G01	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 55 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-G01	
Photograph ID: 56 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-G01	

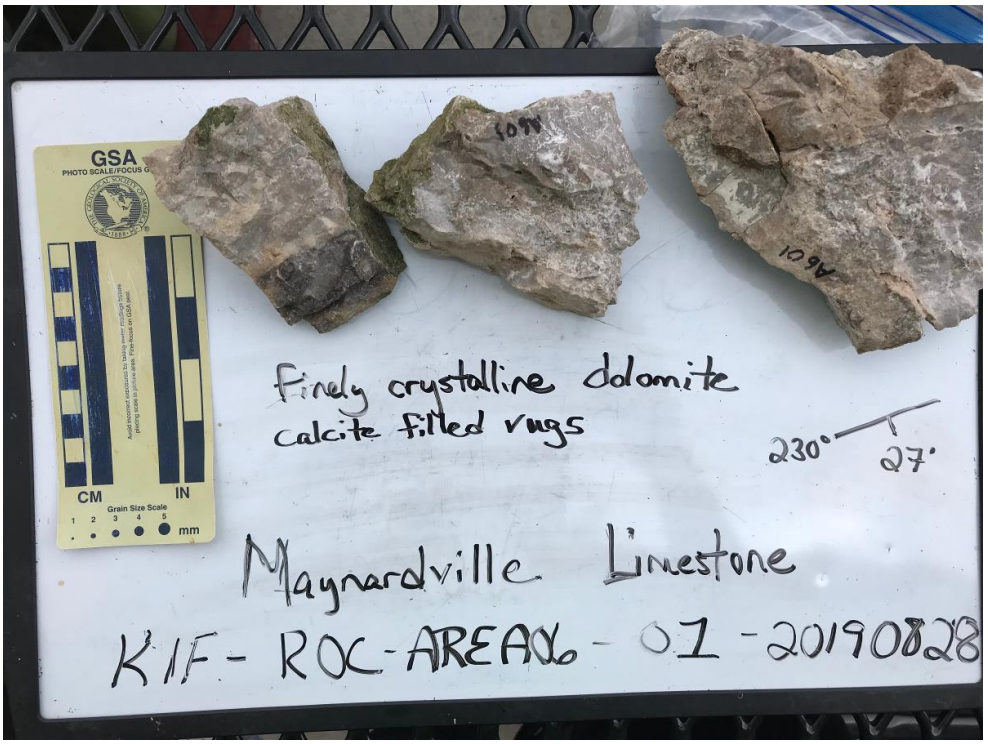
Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 57 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-G01	
Photograph ID: 58 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-G01	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 59 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-G01	
Photograph ID: 60 **Photo Location:** Area 05 **Direction::** **Photo Date:** 9/6/2019 **Comments:** KIF-ROC-AREA05-G01	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 61 **Photo Location:** Area 06 **Direction::** **Photo Date:** 8/28/2019 **Comments:** KIF-ROC-AREA06-01. Strike and dip should read N50°E, 27°SE	
Photograph ID: 62 **Photo Location:** Area 06 **Direction::** **Photo Date:** 9/4/2019 **Comments:** KIF-ROC-AREA06-01. Strike and dip should read N50°E, 27°SE	

Client:	**Tennessee Valley Authority**	**Project:**	**TDEC Order**
Site Name:	**Kingston Fossil Plant (KIF)**	**Site Location:**	**Harriman, Tennessee**

Photograph ID: 63

Photo Location:
Area 06

Direction::

Photo Date:
9/4/2019

Comments:
KIF-ROC-AREA06-01