Prepared for



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# ASSESSMENT OF CORRECTIVE MEASURES REPORT PLANT BOWEN ASH POND 1 (AP-1)

Prepared by



engineers | scientists | innovators

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#### ASSESSMENT OF CORRECTIVE MEASURES REPORT

Plant Bowen Ash Pond 1

June 12, 2019

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ACM Assessment of Corrective Measures

AP ash pond

CCR coal combustion residuals
CFR Code of Federal Regulations

cm/sec centimeters per second

EPD Environmental Protection Division

ft feet

ft bgs feet below ground surface

ft/ft feet per foot

GPC Georgia Power Company

GWPS Groundwater Protection Standard HAR Hydrogeologic Assessment Report ISS in-situ solidification/stabilization Kh horizontal hydraulic conductivity Kv vertical hydraulic conductivity MNA monitored natural attenuation O&M operations and maintenance

P&T pump and treat

PE professional engineer

PRB permeable reactive barriers

RCRA Resource Conservation and Recovery Act

SSL statistically significant level

US EPA United States Environmental Protection Agency

ZVI zero-valent iron

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#### 1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (US EPA) coal combustion residual (CCR) rule [40 Code of Federal Regulations (CFR) Part 257, Subpart D] and the Georgia Environmental Protection Division (EPD) Rules for Solid Waste Management 391-3-4-.10, Geosyntec Consultants, Inc. (Geosyntec) has prepared this Assessment of Corrective Measures (ACM) Report for Georgia Power Company (GPC) Plant Bowen Ash Pond 1 (AP-1 or Site). Pursuant to 40 CFR 257.96 and Georgia Rule 391-3-4-.10(6)(a), this ACM evaluates potential corrective measures to address the statistically significant levels (SSLs) of cobalt and molybdenum identified in the 2018 Annual Groundwater Monitoring and Corrective Action Report (Geosyntec, 2019), which are the target constituents for corrective measures presented in this report.

The ACM was initiated within 90 days of identifying the SSLs on January 13, 2019; and a 60-day extension until June 12, 2019, for completion of the ACM was documented on April 12, 2019. Eight delineation groundwater monitoring wells, installed to assess the extent of cobalt and molybdenum in groundwater at the Site, show that cobalt and molybdenum are horizontally delineated and contained within the property boundary. This ACM is the first step in identifying viable corrective measures to address SSLs in groundwater at the Site. Based on the results of the ACM, further evaluation may be performed, site-specific studies completed, and a corrective action plan developed and implemented pursuant to 40 CFR 257.97 and 257.98 and Georgia Rule 391-3-4-.10(6)(a).

#### 1.1 Purpose

The purpose of this ACM is to begin the process of selecting corrective measure(s) for groundwater. This process is typically iterative and may be composed of multiple steps to analyze the effectiveness of corrective measures to address the potential migration of CCR constituents in groundwater at AP-1.

Once potential corrective measures are identified in this ACM, they are further evaluated using the criteria outlined in 40 CFR 257.96(c) and Rule 391-3-4-.10(6)(a), which state that corrective measures assessment should include an analysis of the effectiveness of potential corrective measures that considers the following:

- Performance;
- Reliability;
- Ease of implementation;

- Potential impacts (including safety, cross-media, and exposure);
- The time required to begin and complete the remedy; and
- Any institutional requirements (e.g., permitting or environmental and public health requirements) that could affect implementation of the remedy.

These evaluation criteria are considered for each potential corrective measure. Further evaluation of the technologies will be required to select a corrective measure(s).

#### 1.2 Site Location and Description

Plant Bowen is a four-unit, coal-fired, electric-generating facility located nine miles southwest of Cartersville in Bartow County, Georgia. The plant is bordered by the Etowah River to the north and east, and Euharlee Creek to the northwest and west (**Figure 1**). Plant Bowen commenced operations in the 1970s.

Plant Bowen has a single CCR ash pond (AP-1) that occupies an area of approximately 254 acres. In preparation for AP-1 closure, the plant completed the conversion to dry ash handling in early 2019 and AP-1 no longer receives ash. Additionally, active projects are ongoing at the plant to remove any additional waste streams from AP-1.

#### 1.3 Pond Closure

GPC will close AP-1 by excavation and consolidation by reducing the footprint from 254 acres to 144 acres within the current footprint. The Closure Plan submitted to Georgia EPD as part of the closure permit application package details the closure activities and requirements in accordance with 40 CFR 257.102 and corresponding Rule 391-3-4-.10(7)(b). The Closure Plan has been summarized in the Amended Written Closure Plan and published in 2018 to GPC's webpage.

AP-1 will be closed by excavating the entirety of CCR within the unit and consolidating the excavated CCR into an approximately 144-acre fully-lined, multi-cell storage facility situated within the current footprint of AP-1. The CCR will be dewatered prior to placement in the containment cells. A base composite liner system and a final cover system will be placed over the entire containment area. The CCR will be excavated, at a minimum, to the interface of the CCR and the residual soils underlying AP-1, plus an additional six inches. Further excavation of the residuum will occur as needed to satisfy the foundation improvement requirements of the design. Once excavation and foundation improvements are complete within the consolidated footprint, compacted fill will be



placed to improve the foundation and provide a stable subgrade for construction of the composite liner system. Once the liner system is installed, the lined area will be filled with appropriately conditioned and compacted CCR. This process will continue in a phased construction approach over the consolidated footprint. The final cover system for the consolidated footprint will consist of either a soil-geosynthetic composite cover system or a synthetic engineered turf (with a maximum hydraulic conductivity of 1x10<sup>-5</sup> centimeters per second [cm/sec]), which will be designed to meet or exceed the requirements of 257.102(d)(3)(iii) for an alternative cover system. The final cover system design will ensure that the potential for disruption of the integrity of the final cover system is minimized through a design that accommodates settlement and subsidence, in addition to providing an erosion layer for protection from wind or water erosion.

The closure of AP-1 in the manner described above provides a source control measure that reduces the potential for migration of CCR constituents to groundwater. Corrective measures discussed in this ACM are being evaluated to address SSLs in groundwater at the compliance boundary. The compliance boundary is the unit boundary where the detection morning network is installed.

#### 2.0 CONCEPTUAL SITE MODEL

The following section summarizes the geologic and hydrogeologic conditions at the Site as described in the AP-1 *Hydrogeologic Assessment Report* (HAR) submitted to Georgia EPD as supporting documents for the closure permit application.

#### 2.1 Geology

The Site is located in the Valley and Ridge Physiographic Province of northwest Georgia, which is characterized by Paleozoic sedimentary rocks that have been folded and faulted into the ridges and valleys that gave this region its name. The floor of the valley is underlain by shales, dolomites, and limestones of Cambrian and Ordovician age. Geologic mapping performed by Lawton et al. (1976) indicates that the Site is underlain by the Ordovician-Cambrian age Knox Dolomite and the Ordovician age Newala Limestone. Based on review of subsurface investigations at the Site, the bedrock is described as predominantly dolomite. AP-1 is underlain primarily by three lithologic units: (i) fill material consisting of earthen embankments and CCR material, (ii) residuum, and (iii) competent dolomite/limestone bedrock.

Based on subsurface investigations, the CCR materials include fly ash, that comprises the bulk of the CCR materials observed in AP-1, and occasional lenses of bottom ash material, generally described as light brownish gray to very dark gray, loose to stiff silty sand, and medium to coarse sand. The residuum at the Site is the result of in-place weathering of the underlying dolomite/limestone bedrock. The residuum consists mainly of mottled light brown to red to yellow, low to high plasticity, stiff to very stiff clay, silt, and silty clay. Most soils contain varying amounts of black chert nodules and chert gravel. The bedrock at the Site is described as light to dark gray, fine to medium-grained, thinly-bedded to massive, dense, and hard dolomite, limestone, and dolomitic limestone. Some evidence of weathering along fracture or bedding surfaces was observed, with some manganese or iron oxide staining. Abundant calcite veins and occasional zones of healed dolomite breccia were observed throughout the bedrock. Solution features in the underlying limestone/dolomite bedrock form over geological timeframes along preexisting discontinuities such as joints and bedding planes. At the Site, these solution features are typically filled with sediment from the in-place weathering of the bedrock or the downward migration of the overlying residuum, but they may also be fully or partially open, or water filled.

#### 2.2 **Hydrology and Groundwater Flow**

The uppermost aquifer at AP-1 is a regional groundwater aquifer that occurs in the residuum and fractured and solutioned bedrock. Groundwater recharge is by precipitation falling onto outcrop areas and then percolating through the residuum to bedrock. Groundwater flow in bedrock is under unconfined to semi-confined conditions from the mantle of overlying lower-permeability residuum and is controlled by secondary porosity along fractures and solution-enhanced features. Based on observations of residuum soil types and horizontal conductivity values, the movement of groundwater in the residuum and highly-weathered upper surface of the bedrock is slow and more characteristic of porous media flow than secondary porosity (fracture) flow. Groundwater flow in the underlying dolomite/limestone bedrock is likely controlled by preferential flow pathways associated with fractures and solution-enhanced joints and fissures.

Groundwater within the residuum and bedrock at AP-1 generally flows to the north and northwest. A component of flow in the southernmost portion of AP-1 is to the south and west, likely due to groundwater mounding related to historical free water storage at the recycle pond. Groundwater level data are recorded during each groundwater sampling event from the AP-1 well network and are depicted on **Figure 2** and discussed in detail in Section 3.1.1. The data are used to generate potentiometric surface maps that depict the groundwater flow direction and to calculate hydraulic gradients. The potentiometric surface map representing the April 2019 groundwater level data is provided on **Figure 3**.

Clustered piezometers installed in the interior of AP-1 indicate higher water levels in the CCR materials than in the underlying bedrock. The low permeability residuum overlying bedrock enables water to pond in the CCR. This condition results in a downward hydraulic gradient between the perched water within AP-1 and the uppermost groundwater aquifer, with only slow percolation from the pond, through the residuum to groundwater. Groundwater gradients in the uppermost aquifer are also influenced by the flow from beneath the unlined General Service Water Pond, located east of AP-1. The AP-1 recycle pond also influenced gradients within the southern portion of AP-1, the effects of which are now diminished since the plant discontinued using the pond in November 2017 for normal plant operations. The typical groundwater hydraulic gradient across the interior of AP-1 is approximately 0.014 feet/foot (ft/ft). While vertical hydraulic gradients at AP-1 are downward, they likely reverse to an upward gradient near natural groundwater discharge areas.

The horizontal hydraulic conductivity ( $K_h$ ) values for residuum range from 1 x 10<sup>-6</sup> to 1 x 10<sup>-8</sup> cm/sec. The vertical hydraulic conductivity ( $K_v$ ) of residuum, measured in a

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laboratory permeability test on a Shelby tube sample, was  $1.4 \times 10^{-7}$  cm/sec, which compares similarly to previously reported vertical hydraulic conductivity values. Horizontal hydraulic conductivity values measured for bedrock ranged from  $2.1 \times 10^{-5}$  to  $1.0 \times 10^{-2}$  cm/sec, with a geometric mean of  $8.6 \times 10^{-4}$  cm/sec. Additional details regarding the hydrogeologic conditions in vicinity of AP-1 are provided in the HAR.

#### 3.0 NATURE AND EXTENT DELINEATION

The following describes monitoring-related field and assessment activities performed to date in support of (i) delineating the nature and extent of SSLs in groundwater and (ii) evaluating potential corrective measures to address them.

#### 3.1 Groundwater Monitoring & Constituents of Concern

#### 3.1.1 Groundwater Monitoring Program

In accordance with 40 CFR 257.91, a groundwater monitoring system was installed at AP-1 which (1) consists of a sufficient number of wells, (2) is installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer, and (3) represents the groundwater quality both upgradient of the units (i.e., background conditions) and passing the waste boundary of the units. The number, spacing, and depths of the groundwater monitoring wells were selected based on the characterization of site-specific hydrogeologic conditions. The well network was certified by a professional engineer (PE) on October 10, 2017, and the certification is maintained in the AP-1 Operating Record. The certified compliance monitoring well network for AP-1 consists of a total of 19 monitoring wells: two upgradient wells and 17 downgradient wells. The locations of the wells for the compliance monitoring well network are shown on **Figure 2** and well construction details are listed in **Table 1.** Groundwater is currently monitored in AP-1 wells under the assessment monitoring program pursuant to 40 CFR 257.95. Additional groundwater monitoring details are provided in the *2018 Annual Groundwater and Corrective Action Monitoring Report* (Geosyntec, 2019).

#### 3.1.2 SSLs for Appendix IV Constituents

Groundwater monitoring data collected during the semiannual monitoring events in June and October 2018 were statistically analyzed pursuant to 40 CFR 257.93(f) and in general accordance with the US EPA document *Statistical Analysis of Groundwater Data at RCRA Facilities Unified Guidance* (Unified Guidance) (US EPA, 2009). Following Federal and state rule requirements, separate groundwater protection standards (GWPS) were established for statistical comparisons of Appendix IV assessment monitoring parameters. Appendix IV GWPS are provided in **Table 2**. Appendix IV parameters detected during the semiannual monitoring event were compared to GWPS to assess if concentrations in compliance wells statistically exceeded the GWPS. Details regarding the statistical analyses are provided in the *2018 Annual Groundwater and Corrective Action Monitoring Report* (Geosyntec, 2019).

Statistical analyses of the June and October 2018 analytical data identified SSLs of cobalt and molybdenum in the following wells:

AP-1 (Federal CCR Rule):

• Cobalt: BGWC-22

AP-1 (Georgia EPD CCR Rule):

• Cobalt: BGWC-22;

• Molybdenum: BGWC-20, BGWC-22, BGWC-23, and BGWC-30

In accordance with 40 CFR 257.95(g), a notification identifying SSLs for cobalt and molybdenum was prepared for AP-1 and placed in the Operating Record on November 14, 2018. Pursuant to 40 CFR 257.96, an ACM was initiated for AP-1 on January 13, 2019.

#### 3.2 <u>Field Investigation Activities</u>

Extensive subsurface investigations have been conducted at the Site. The results of these subsurface investigations are discussed in the HAR, which included: geophysics, soil and rock borings, geotechnical testing, rock coring, well and piezometer installation, slug testing, and groundwater sampling.

Eight delineation groundwater monitoring wells were installed between July 2018 and April 2019 to assess the extent of cobalt and molybdenum in groundwater at the Site. Wells BGWC-31, BGWC-32, and BGWA-33 were installed for horizontal delineation and wells BGWC-34D, BGWC-35D, BGWC-36D, BGWC-37D, and BGWC-38D were installed for vertical delineation. Detailed boring and well construction logs for these eight new wells are provided in **Appendix A**. The locations of these eight delineation wells are shown on **Figure 2** and well construction details are also provided in **Table 1**.

Pursuant to 40 CFR 257.96, groundwater in the vicinity of AP-1 continues to be monitored during the ACM phase in accordance with the assessment monitoring program established for the CCR unit in 2018. Groundwater samples were collected from the compliance wells in February 2019 and analyzed for the full suite of the Appendix IV parameters per 40 CFR 257.95(b). In April 2019, compliance and delineation (BGWA-6, BGWA-33, BGWC-31, BGWC-32, BGWC-34D, BGWC-35D, and BGWC-36D) wells were sampled as part of the first semiannual monitoring event. A supplementary



groundwater sampling event was conducted in May 2019 to verify cobalt concentrations observed in delineation well BGWC-32 during the April 2019 semiannual event and to sample deep delineation wells BGWC-37D and BGWC-38D installed on April 18 and April 25, 2019, respectively. Cobalt results in BGWC-32 during the April 2019 sampling event were not verified by subsequent resampling in May 2019, and the SSL of cobalt at BGWC-22 is horizontally delineated by BGWC-32. The groundwater analytical results from the February, April, and May 2019 events are summarized in **Table 3**. Laboratory reports associated with the 2019 results are provided in **Appendix B**.

The 2019 analytical results reported for the horizontal delineation wells (BGWC-31, BGWC-32, and BGWA-6) show that cobalt and molybdenum are contained within the property boundary. For these wells, the cobalt and molybdenum concentrations are below their respective GWPS. Molybdenum is vertically delineated in well BGWC-20 by well BGWC-34D. Vertical delineation of molybdenum in wells BGWC-22, BGWC-23, and BGWC-30 is currently in progress.

The April 2019 semiannual event results reported for the compliance wells will be statistically evaluated relative to the site-specific GWPS and reported in the corresponding semiannual groundwater monitoring report, which will be published online on August 30, 2019.

#### 4.0 GROUNDWATER CORRECTIVE MEASURES

#### 4.1 Objectives of the Corrective Measures

In evaluating the effectiveness of potential corrective measures using the criteria listed in 40 CFR 257.96(c) and referenced in Rule 391-3-4-.10(6)(a), including performance, reliability, ease of implementation, potential impacts, time required, and institutional and public health requirements, the following criteria listed in 40 CFR 257.97(b) and corresponding Rule 391-3-4-.10(6)(a) must be met by the corrective measure when selected:

- Be protective of human health and the environment;
- Attain applicable groundwater protection standards as specified pursuant to 40 CFR 257.95(h);
- Control the source(s) of releases to reduce or eliminate, to the maximum extent feasible, further releases of constituents in appendix IV to this part to the environment;
- Remove from the environment as much of the contaminated material that was
  released from the CCR unit as is feasible, taking into account factors such as
  avoiding inappropriate disturbance of sensitive ecosystems; and
- Comply with standards for management of wastes as specified in 40 CFR 257.98(d).

Corrective measures selected for evaluation herein for potential use at AP-1 are anticipated to satisfy the above criteria to varying degrees of effectiveness.

#### **4.2 Summary of Corrective Measures**

The closure of AP-1 as described in Section 1.3 is a source control measure that reduces the potential for migration of CCR constituents to groundwater. Corrective measures discussed in this ACM are being evaluated to address SSLs in groundwater at and downgradient of the compliance boundary.

This section presents potential corrective measures capable of remediating the Appendix IV groundwater constituents (i.e., cobalt and molybdenum) at AP-1. Each corrective measure is evaluated relative to criteria specified in 40 CFR 257.96(c) and 40 CFR



257.97(b). **Table 4** provides a comparative screening of the corrective measures discussed in Section 4.

The following potential corrective measures are considered in this ACM:

- Geochemical Approaches (In-Situ Injection)
- Hydraulic Containment (Pump and Treat)
- In-Situ Solidification/Stabilization
- Monitored Natural Attenuation
- Permeable Reactive Barrier
- Phytoremediation
- Subsurface Vertical Barrier Walls

While in-situ solidification/stabilization (ISS) is generally considered a viable option for either small source areas or targeted zones within a larger footprint, this potential corrective measure is not a viable corrective measure at AP-1. The closure of AP-1 as previously described will remove CCR materials and place them into a fully lined, multicell storage facility situated within the current footprint of AP-1. As such, the CCR materials that could be stabilized using ISS will be isolated and stabilization would provide no long-term benefit. Therefore, ISS is not considered an applicable groundwater corrective measure for AP-1 and no detailed evaluation is provided in **Table 4**.

#### **4.2.1** Geochemical Approaches (In-Situ Injection)

Cobalt and molybdenum can be precipitated and/or immobilized under different combinations of pH and redox conditions. A variety of pH and/or redox-altering technologies are available which can incorporate biological processes, chemical oxidants and reductants, and/or mechanical processes such as air sparging. These processes can be used to decrease the mobility of these constituents. For example, cobalt can be sorbed to iron and manganese oxides or precipitated as sparingly soluble cobalt sulfide minerals, while molybdenum can be sorbed to aluminum and iron oxides as well as clay minerals.

To understand the biogeochemical processes that would effectively immobilize target constituents in groundwater, site-specific bench-scale and pilot-scale treatability studies are needed to prepare an effective amendment to create the appropriate conditions for the precipitation and/or sorption of these constituents without mobilizing other naturally-occurring constituents. Once precipitated, these minerals are often stable even if geochemical conditions revert back to a different redox environment. However, if not properly designed and implemented, manipulating redox conditions without forming the



desired compounds may increase the mobility of naturally-occurring constituents such as iron, manganese, and arsenic.

Air sparging can be used to provide oxygen to the subsurface in an attempt to precipitate out (or make more "sorptive") compounds that are generally more soluble and mobile under reducing conditions. This can also support the precipitation of iron and manganese oxides, which would provide additional sorption sites for constituents such as cobalt and molybdenum.

Furthermore, in-situ chemical oxidation (ISCO) or in-situ chemical reduction (ISCR) can be used to chemically alter the redox environment in the subsurface to affect the mobility and/or toxicity of certain inorganic compounds.

The main limiting process in these in-situ remedial approaches is the delivery of the compounds within the area of interest. Mixing and contact with the target constituents are necessary and can be difficult in heterogeneous materials and fine-grained materials.

While it is currently not well understood whether molybdenum can be efficiently attenuated using in-situ redox manipulations due to slow reaction kinetics, the attenuation of cobalt is expected to occur under both aerobic (via sorption to manganese or iron oxides) and anaerobic conditions (via formation of sulfide minerals). Therefore, in-situ injections are considered a potentially viable corrective measure to address cobalt and molybdenum in groundwater at AP-1, especially in smaller, more localized areas, and will be retained for further evaluation.

#### **4.2.2** Hydraulic Containment (Pump and Treat)

Generally, hydraulic containment (or control) refers to the use of groundwater extraction to artificially induce a hydraulic gradient and capture or control the migration of impacted groundwater. One example, groundwater pump and treat (P&T), is often considered to be a viable remedial technology at many sites (US EPA, 1996). This approach uses extraction wells or trenches to capture groundwater, which may subsequently require above-ground treatment and permitted discharge to a receiving water feature or sewer system, reinjection into the aquifer, or reuse at the generating station. Groundwater P&T is often relatively slow and costly as a means to restore groundwater quality over a long-term period, but can be effective as an interim measure, or combined with another measure, to provide hydraulic containment to limit constituent migration toward a potential receptor.



Groundwater extraction for hydraulic control can often effectively address the variety of inorganic constituents encountered at CCR sites, including cobalt and molybdenum. Extraction technologies also have the ability to overcome the limitations of in situ injection-based technologies (i.e., mixing and contact with affected materials, and to access impacted groundwater in lower permeability geologic formations such as fractured bedrock). Space constraints are mainly limited to the above-ground conveyance and treatment component of a P&T system since extraction wells can generally be fit into relatively tight spaces at the edge of waste or other points of compliance.

Extracted groundwater may need to be treated prior to discharge (depending on discharge permit requirements) but does have the potential to be reused for irrigation (e.g., of a cover system or other vegetated areas at the Site) or dust suppression purposes. It could also be used as moisture conditioning of dry ash that is being landfilled. Therefore, P&T is a potentially viable corrective measure for cobalt and molybdenum in groundwater at AP-1 and will be retained for further evaluation.

#### 4.2.3 Monitored Natural Attenuation

The US EPA defines monitored natural attenuation (MNA) as the reliance on natural attenuation processes (within the context of a carefully controlled and monitored site cleanup approach) to achieve site-specific remediation objectives within a time frame that is reasonable compared to that offered by other more active methods. The natural attenuation processes that are at work in such a remediation approach include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater. These in-situ processes include biodegradation; dispersion; dilution; sorption; volatilization; radioactive decay; and chemical or biological stabilization, transformation, or destruction of contaminants (US EPA, 2015b).

Attenuation mechanisms for inorganic constituents, such as molybdenum and cobalt, are either physical or chemical. Physical attenuation mechanisms such as dilution and dispersion may be appropriate as a polishing step (e.g., at the boundaries of impacted groundwater, when source control is complete, an active remedy is being used at the Site, and appropriate land use and groundwater controls are in place). Chemical attenuation mechanisms through sorption reactions, discussed in more detail below, may be viable as a stand-alone corrective measure.

"MNA may, under certain conditions (e.g., through sorption or oxidation-reduction reactions), effectively reduce the dissolved concentrations and/or toxic forms of inorganic

contaminants in groundwater and soil. Both metals and non-metals (including radionuclides) may be attenuated by sorption reactions such as precipitation, adsorption on the surfaces of soil minerals, absorption into the matrix of soil minerals, or partitioning into organic matter. Oxidation-reduction (redox) reactions can transform the valence states of some inorganic contaminants to less soluble and thus less mobile forms (e.g., hexavalent uranium to tetravalent uranium) and/or to less toxic forms (e.g., hexavalent chromium to trivalent chromium)" (US EPA, 2015b, p. 8/9). Both site-specific constituents (i.e., cobalt and molybdenum) undergo sorption reactions and, depending on specific redox conditions, cobalt may also form sparingly soluble sulfide minerals via abiotic or biotic processes.

The US EPA uses four phases to establish whether MNA can be successfully implemented at a given site. The phases (or steps) include:

- 1. Demonstration that SSLs in groundwater are delineated and stable.
- 2. Evaluation of the mechanisms and rates of attenuation.
- 3. Assessment if the capacity of the aquifer is sufficient to attenuate the mass of constituents in groundwater and that the immobilized constituents are stable and will not remobilize.
- 4. Design of a performance monitoring program based on the mechanisms of attenuation and including a decision framework for consideration of a contingent remedy tailored to site-specific conditions should MNA not perform adequately.

Physical and chemical MNA mechanisms for cobalt and molybdenum, including dilution, dispersion, and sorption can be operational without the potential for additional mass of constituents migrating to downgradient groundwater. Even under current conditions, attenuation processes for cobalt and molybdenum are already occurring as evidenced by groundwater data from delineation wells. Therefore, MNA is a potentially viable corrective measure for cobalt and molybdenum in groundwater at AP-1 and will be retained for further evaluation.

#### 4.2.4 Permeable Reactive Barriers

Permeable reactive barriers (PRBs) can present a viable alternative for in-situ treatment of cobalt and molybdenum. The technology typically involves the installation of a subsurface wall constructed with reactive media such as zero-valent iron (ZVI), biologically active media (to induce oxidizing or reducing conditions), or clays, apatite,

zeolites, and/or peat moss (to promote ionic exchange and/or sorption). PRBs have proven to be effective in passively treating several inorganic constituents found at CCR sites, including arsenic, selenium, and chromium (e.g. ITRC, 2011). The use of PRBs for cobalt and molybdenum has been tested (e.g., Ludwig et al., 2002; ITRC, 2011), but additional site-specific testing is needed to confirm the applicability of this technology to cobalt and molybdenum removal from groundwater. For example, molybdenum may experience early breakthrough with ZVI-type media (e.g., Morrison et al., 2006) and careful testing is required to select the appropriate treatment media.

PRBs can be installed in downgradient locations using conventional excavation methods or one-pass trenching method. Excavated trenches get back-filled with reactive media to create a barrier that treats dissolved constituents as they passively flow through the PRB with the groundwater (e.g., ITRC, 2011). These systems can either be constructed as continuous "walls" or as "funnel-and-gate" systems where (impermeable) slurry walls create a "funnel" that directs groundwater to permeable "treatment gates" filled with reactive materials. Since the costs for reactive materials (e.g., ZVI or similar) are generally higher than bentonite-based slurry wall construction, these configurations with a smaller treatment area help to lower construction and maintenance costs. Similar to slurry walls (see Section 4.2.6), PRBs are typically keyed into an underlying low-permeability unit such as a clay layer or bedrock.

The installation depths of a PRB unit are generally limited to about 90 ft below ground surface (ft bgs). The installation of a PRB generally requires more space than extraction wells, but the system does not require above-ground treatment components and therefore, the overall treatment footprint is likely to be smaller compared to a P&T system.

While additional subsurface investigations, aquifer testing, reactive media testing, and compatibility testing of groundwater and a slurry wall component of a PRB will be needed to further evaluate the feasibility of installing a PRB at AP-1, the technology is currently considered to be a potentially viable corrective measure to address cobalt and molybdenum in groundwater at AP-1 and will be retained for further evaluation.

#### 4.2.5 Phytoremediation

Phytoremediation is the use of plants to degrade, immobilize, or contain constituents in soil, groundwater, surface water, and sediments. Over recent decades, phytoremediation has emerged as a viable alternative to more active and costly environmental cleanup technologies, especially for large areas with relatively low levels of constituents in shallow soils or groundwater. The effectiveness of groundwater remediation using



traditional phytoremediation approaches may be limited by compacted soil conditions that impede root penetration, or target groundwater that is too deep for root access. Given that groundwater wells at the Site that exhibited SSLs for cobalt and molybdenum are screened to depths of about 50 ft bgs, traditional plantings for phytoremediation are not expected to be successful. However, more recently, an engineered approach to phytoremediation, the *TreeWell*® system (which is a proprietary system developed by Applied Natural Sciences [ANS]), has been shown to overcome these constraints by utilizing a specialized lined planting unit constructed with optimum planting media designed to promote downward root growth, encourage constituent treatment, and focus groundwater extraction from a targeted depth interval (e.g., Gatliff et al., 2016).

By installing a cased "well" for tree planting using large diameter auger (LDA) technology, extraction of deeper groundwater zones (i.e., in excess of 50 ft bgs) can be achieved since the surface of the "well" is sealed and only groundwater from a targeted zone is allowed into the cased-off borehole. This type of system mirrors a traditional mechanical extraction system using the trees as pumps. The *TreeWell* system can be used for both hydraulic control of groundwater and for treatment of constituents via degradation (for organic constituents) or immobilization/containment mechanisms (for organic and inorganic constituents). With respect to the site-specific conditions, the system would be applied for hydraulic control, but cobalt and molybdenum are expected to be either immobilized within the root zone or incidentally taken up into the tree biomass.

The advantage of the system includes no above-ground water management needs and limited long-term operations and maintenance (O&M) requirements following the establishment of the tree system. Such systems have been observed to meet design hydraulic control parameters typically by the end of the third growing season, when properly designed and spaced. The layout for a *TreeWell* remediation system is generally based on groundwater flow modeling assuming a design uptake rate of approximately 40 to 60 gallons per day per tree.

Based on the site-specific hydrogeology (e.g., relatively slow groundwater velocities in the finer-grained residuum as well as the top of bedrock) and low levels of cobalt and molybdenum, as well as the availability of potential planting areas downgradient of AP-1, an engineered phytoremediation approach is a potentially viable corrective measure for cobalt and molybdenum in groundwater at AP-1 and will be retained for further evaluation.

#### 4.2.6 Subsurface Vertical Barrier Walls

Subsurface vertical barrier walls (sometimes referred to as slurry walls) have been used for seep control and groundwater cutoff at impoundments and waste disposal units for more than three decades. In general, barrier walls are designed to provide containment; localized treatment achieved through the sorption or chemical precipitation reactions from construction of the walls are incidental to the design objective.

This approach involves placing a barrier to groundwater flow in the subsurface, frequently around the source area (or the downgradient limits of the source area), to prevent future migration of dissolved constituents in groundwater from beneath the source to downgradient areas. Barrier walls can also be used in downgradient applications to limit discharge to a surface water feature or to reduce aquifer recharge from an adjacent surface water feature when groundwater extraction wells are placed near a surface water feature. A variety of barrier materials can be used, including cement and/or bentonite slurries or various mixtures of soil with cement or bentonite, geomembrane composite materials, or driven materials such as steel or vinyl sheet pile.

The installation of these low-permeability walls is similar to the methods described for PRBs above. In general, the applicability of slurry walls is limited by the depth of installation, which is approximately 90 ft below ground surface. However, site-specific geologic and technology-specific considerations may limit this depth to shallower installations.

Groundwater pumping is required upgradient of the barrier wall to maintain an inward hydraulic gradient. The extracted groundwater would likely require treatment in an above-ground treatment system.

While additional subsurface investigations, aquifer testing, and wall compatibility testing with the groundwater chemistry will be needed to further evaluate the feasibility as well as the placement of a barrier wall at AP-1, the technology is currently considered to be a potentially viable corrective measure to address cobalt and molybdenum in groundwater at AP-1 and will be retained for further evaluation.

#### 5.0 REMEDY SELECTION PROCESS

The purpose of this ACM is to begin the process of selecting corrective measure(s) for groundwater based on further evaluation using the criteria outlined in 40 CFR 257.96 and Georgia Rule 391-3-4-.10(6)(a). The following sections present the pond closure and site management strategy, additional data gathering, schedule, reporting, and next steps.

#### 5.1 Pond Closure and Site Management Strategy

GPC plans to close AP-1 by excavation and consolidation of the unit's CCR material into a lined, multi-cell storage facility situated within the current footprint of AP-1 providing source control. During the pond closure, temporary changes in site conditions may occur. Additionally, the site conceptual model may need to be refined and/or updated from the current understanding as more data are collected. GPC plans to proactively utilize adaptive site management to support the remedial strategy and address potential changes in site conditions as appropriate. Under an adaptive site management strategy, a remedial approach will be selected whereby: (1) a corrective measure will be installed or implemented to address current conditions; (2) the performance of the corrective measure will be monitored, evaluated, and reported semiannually; (3) the site conceptual model will be updated as more data are collected; and (4) adjustments and augmentations will be made to the corrective measure(s), as needed, to assure that performance criteria and site remedial goals are met.

#### 5.2 Additional Data Gathering

Additional data, data analysis, and site-specific evaluation are necessary to refine the conceptual site model and to further evaluate the feasibility of each corrective measure presented herein such that an appropriate groundwater corrective measure may be selected. Some of the data needed to refine the conceptual site model may be collected concurrent with routine groundwater monitoring events under the assessment monitoring program, or during supplementary sampling, if required. However, additional data collection that includes aquifer testing, groundwater modeling, material compatibility testing, bench scale studies, and pilot tests may require an estimated one to two additional years to complete. Once sufficient data are available to arrive at a focused number of corrective measures or a combination of corrective measures that would provide an effective groundwater remedy, necessary steps will be taken to implement a remedy at the Site in accordance with 40 CFR 257.98.

#### 5.3 Schedule, Reporting, and Next Steps

It is anticipated that additional data collection will begin in 2019. GPC will prepare semiannual reports to document Site groundwater conditions, results associated with additional data gathering identified in Section 5.2 and in Table 4, and the progress in selecting and designing the remedy in accordance with 40 CFR 257.97(a). The reports will be posted to GPC's website.



At least 30 days prior to the selection of remedy or remedies, a public meeting to discuss the results of the corrective measures assessment will be held pursuant to 40 CFR 257.96(e). The final remedy selection report will be developed as outlined in 40 CFR 257.97(a). Once the remedy has been selected, the implementation of the remedy will be initiated in accordance with 40 CFR 257.98.

#### 6.0 REFERENCES

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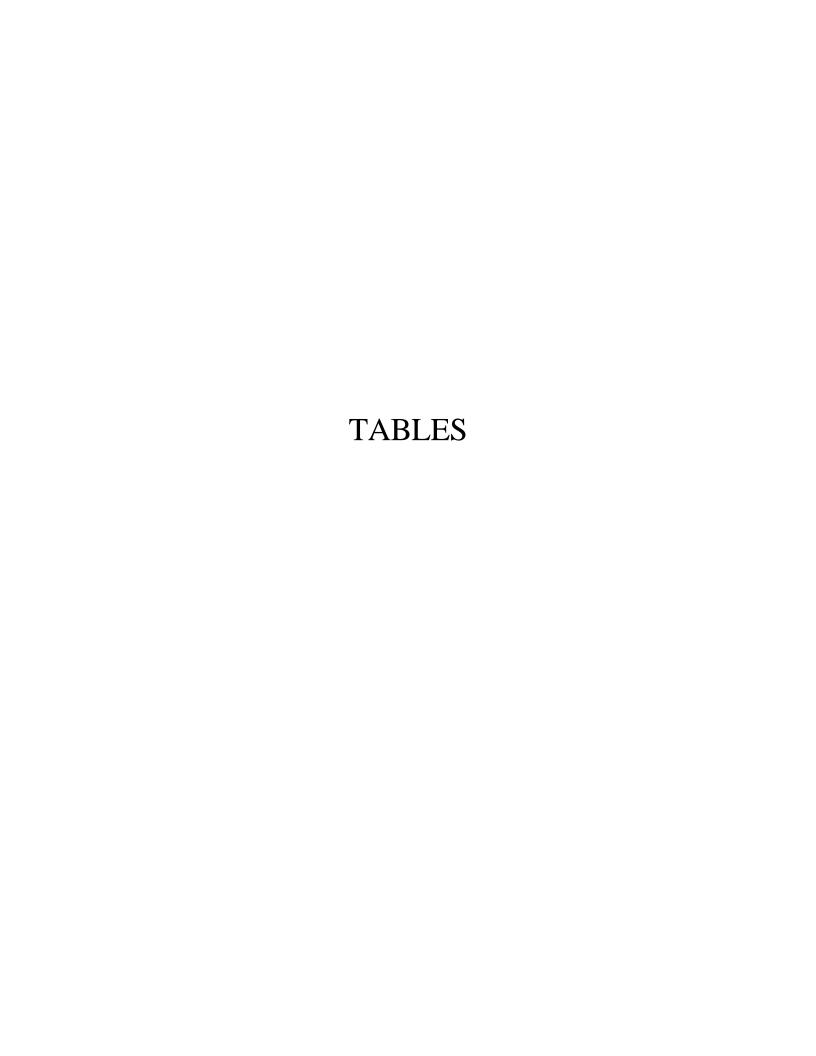


Table 1
Monitoring Well Network Summary
Plant Bowen AP-1, Bartow County, Georgia



Well ID	Hydraulic Location	Installation Date	Northing (1)	Easting (1)	Ground Surface Elevation (ft AMSL)	Top of Screen Elevation (ft AMSL)	Bottom of Screen Elevation (ft AMSL)	Well Depth (ft BTOC) (2)	Screen Interval Length (ft)
Compliance Monitoring	Wells								
BGWA-2	Upgradient	10/29/2015	1499375.65	2068599.23		650.90	640.90	89.17	10
BGWA-29	Upgradient	8/7/2016	1498283.38	2066363.43		632.70	622.70	99.03	10
BGWC-7	Downgradient	10/1/2015	1504713.10	2066801.85		625.50	615.50	90.40	10
BGWC-8	Downgradient	11/18/2015	1504672.07	2066928.29		637.20	627.20	79.73	10
BGWC-9	Downgradient	11/13/2015	1504910.51	2066144.11		638.70	628.70	63.74	10
BGWC-10	Downgradient	10/7/2015	1505032.56	2066080.17		634.20	624.20	62.37	10
BGWC-12	Downgradient	10/21/2015	1505280.77	2065909.74		626.60	616.60	78.28	10
BGWC-14	Downgradient	11/10/2015	1505406.14	2065043.82		640.20	630.20	88.84	10
BGWC-16	Downgradient	11/12/2015	1504656.54	2064248.97		635.80	625.80	48.87	10
BGWC-17	Downgradient	10/22/2015	1504432.14	2064260.75		615.60	605.60	68.39	10
BGWC-18	Downgradient	10/13/2015	1504118.94	2064258.25		645.20	635.20	37.95	10
BGWC-19	Downgradient	10/12/2015	1503742.31	2064245.92		629.40	619.40	54.58	10
BGWC-20	Downgradient	10/9/2015	1503367.84	2064260.88		635.70	625.70	49.73	10
BGWC-21	Downgradient	3/2/2016	1501627.60	2064348.78		648.70	638.70	52.99	10
BGWC-22	Downgradient	10/8/2015	1501324.02	2064359.44		662.70	652.70	43.05	10
BGWC-23	Downgradient	10/15/2015	1501000.87	2064351.45		654.90	644.90	50.95	10
BGWC-24	Downgradient	10/27/2015	1500620.18	2065032.39		646.50	636.50	66.11	10
BGWC-25	Downgradient	3/3/2016	1502292.88	2064244.72		632.90	622.90	57.87	10
BGWC-30	Downgradient	1/4/2017	1499816.75	2066394.31		651.50	641.50	59.98	10
Groundwater Level Mon	itoring Piezometer								
BGWA-1	Downgradient	11/17/2015	1499099.83	2067205.55	718.38	672.30	662.30	58.97	10
BGWA-3	Downgradient	11/5/2015	1499419.93	2065186.44	721.86	645.70	635.70	88.97	10
BGWA-4	Downgradient	3/4/2016	1499484.76	2064697.83	726.09	660.40	650.40	78.61	10
BGWA-5	Downgradient	11/3/2015	1499435.96	2065421.03	718.54	662.10	652.10	69.10	10
BGWC-11	Downgradient	10/16/2015	1504998.34	2066092.86	684.11	619.80	609.80	77.18	10
BGWC-13	Downgradient	10/21/2015	1505436.84	2065250.98	714.89	654.40	644.40	73.45	10
BGWC-15	Downgradient	10/20/2015	1505279.56	2064731.57	715.47	655.10	645.10	73.21	10
BGWA-26	Downgradient	8/5/2016	1498696.48	2064190.20	726.10	663.40	653.40	75.56	10
BGWA-27	Downgradient	8/6/2016	1498718.03	2064387.85	732.55	651.90	641.90	93.74	10
BGWA-28	Downgradient	8/7/2016	1498748.11	2064577.77	734.91	661.20	651.20	86.58	10
PZ-1	Downgradient	6/23/2016	1505600.31	2066843.00	675.29	630.60	620.60	57.54	10
PZ-2	Downgradient	6/24/2016	1503857.59	2062937.95	665.99	649.30	639.30	29.33	10
PZ-3	Downgradient	6/22/2016	1505722.73	2066070.72	705.28	658.60	648.60	59.62	10
PZ-4	Downgradient	6/23/2016	1505788.40	2064315.36	715.93	669.20	659.20	59.78	10

1 of 2 June 2019

## Table 1 Monitoring Well Network Summary Plant Bowen AP-1, Bartow County, Georgia



Well ID	Hydraulic Location	Installation Date	Northing (1)	Easting (1)	Ground Surface Elevation (ft AMSL)	Top of Screen Elevation (ft AMSL)	Bottom of Screen Elevation (ft AMSL)	Well Depth (ft BTOC) (2)	Screen Interval Length (ft)
Delineation Monitoring Wel	ls								
BGWA-6	Downgradient	11/6/2015	1499260.85	2065797.45	714.54	664.50	654.50	62.74	10
BGWA-33	Downgradient	7/10/2018	1497973.36	2064876.50	740.50	672.80	662.80	80.84	10
BGWC-31	Downgradient	7/17/2018	1503498.68	2064022.78	668.59	631.59	621.59	49.70	10
BGWC-32	Downgradient	7/18/2018	1501251.18	2064184.43	696.50	658.60	648.60	51.22	10
BGWC-34D	Downgradient	7/13/2018	1503356.62	2064259.26	672.57	606.10	596.10	79.75	10
BGWC-35D	Downgradient	7/12/2018	1501312.30	2064359.89	693.32	625.32	615.32	80.94	10
BGWC-36D	Downgradient	7/2/2018	1499808.60	2066415.39	698.22	615.22	605.22	96.35	10
BGWC-37D	Downgradient	4/25/2019	1501293.46	2064363.99	693.56	595.56	585.56	112.56	10
BGWC-38D	Downgradient	4/18/2019	1499803.60	2066430.57	697.66	584.66	574.66	129.81	10

Notes:

ft = feet

AMSL = above mean sea level

BTOC = below top of casing

(1) Coordinates in North American Datum (NAD) 1983, State Plane, Georgia-West, feet.

(2) Total well depth accounts for sump if data provided on well construction logs.

2 of 2 June 2019

#### Table 2



#### Summary of Background Concentrations and Groundwater Protection Standards Plant Bowen AP-1, Bartow County, Georgia

Analyte	Units	Background <sup>(1)</sup>	Federal GWPS <sup>(2)</sup>	State GWPS <sup>(3)</sup>
Antimony	mg/L	0.003	0.006	0.006
Arsenic	mg/L	0.005	0.01	0.01
Barium	mg/L	0.218	2	2
Beryllium	mg/L	0.003	0.004	0.004
Cadmium	mg/L	0.001	0.005	0.005
Chromium	mg/L	0.01	0.1	0.1
Cobalt	mg/L	Federal: 0.005 <sup>(4)</sup> State: 0.01	0.006	0.01
Fluoride	mg/L	0.197; 0.191	4	4
Lead	mg/L	0.005	$0.015^{(5)}$	0.005
Lithium	mg/L	Federal: 0.025 <sup>(4)</sup> State: 0.05	0.04	0.05
Mercury	mg/L	0.0005	0.002	0.002
Molybdenum	mg/L	0.01	0.1	0.01
Selenium	mg/L	0.01	0.05	0.05
Thallium	mg/L	0.001	0.002	0.002
Combined Radium-226/228	pCi/L	1.86; 1.68	5	5

#### Notes:

"mg/L" = milligrams per liter

- 1. The background limits were used when determining the groundwater protection standard (GWPS) under 40 CFR \$257.95(h) and Georgia Environmental Protection Division (EPD) Rule 391-3-4-.10(6)(a). Where two numbers are present, they denote the different background concentrations for each of the two semiannual monitoring events in the order that they were determined.
- 2. Under 40 CFR §257.95(h)(1-3) the GWPS is: (i) the maximum contaminant level (MCL) established under §§141.62 and 141.66 of this title; (ii) where an MCL has not been established a rule-specific GWPS or regional screen level (RSL) is used; or (iii) background levels for constituents were the background level is higher than the MCL or rule-specified GWPS.
- 3. Under the existing EPD rules, the GWPS is: (i) the MCL; (ii) where the MCL is not established, the background concentration; or (iii) background concentrations for constituents where the background concentration is higher than the MCL.
- 4. The background tolerance limit (TL) used to evaluate GWPS for this analyte equals half the laboratory specified reporting limit (RL). Per the Statitcal Analysis Plan (SAP), and in accordance with the Unified Guidance, a non-parametric TL approach was used since the data set contained greater than 50% non-detect (ND) results for this analyte. Under this approach, the TL equals the highest value reported, for which is the laboratory RL. Since a RL may be influenced due to sample matrix interference at the time of analysis, half the RL was applied in this select case.
- 5. Currently, there is no Environmental Protection Agency (EPA) MCL established for lead. The value listed as GWPS is the established EPA Action Level for drinking water.

1 of 1 June 2019

<sup>&</sup>quot;pCi/L" = picocuries per liter

**Table 3**Summary of Groundwater Analytical Data
Plant Bowen AP-1, Bartow County, Georgia



	Well ID:	BGWA-2	BGWA-2	BGWA-2	BGWA-29	BGWA-29	BGWC-7	BGWC-7	BGWC-8	BGWC-8	BGWC-9	BGWC-10	BGWC-10	BGWC-12	BGWC-12
	Sample Date:	2/25/2019	4/1/2019	5/2/2019	2/27/2019	4/1/2019	2/28/2019	4/2/2019	2/25/2019	4/1/2019	4/1/2019	2/28/2019	4/2/2019	2/28/2019	4/1/2019
	Parameter (1,2,3)														
III	Boron*		ND (0.0076 J)	ND (0.015 J)		ND (0.0048 J)		1.4		ND (0.046 J)	0.50		ND (0.51 J)		ND (0.86 J)
	Calcium*		48.2	44.8		24.6		140		47.2	59.3		57.8		94.8
	Chloride*		4.2	4.3		1.6		9.4		1.8	13.4		24.1		24.1
APPENDIX	Fluoride*	ND	ND (0.047 J)	ND	ND	ND	ND (0.23 J)	ND (0.22 J)	ND	ND	0.33	ND (0.14 J)	ND (0.044 J)	ND (0.18 J)	ND (0.065 J)
gdd	pH*	7.78	7.7	7.71	8.00	7.85	7.05	6.99	7.75	7.57	7.03	7.55	7.54	7.28	7.23
A	Sulfate*		10.8	11.2		5.2		334		30.5	81.4		105		239
	TDS*		226			114		728		191	326		355		191
	Antimony	ND			ND		ND		ND			ND		ND	
	Arsenic	ND	ND (0.00049 J)		ND (0.0011 J)	ND (0.00019 J)	ND (0.0011 J)	ND (0.0016 J)	ND	ND (0.00041 J)	ND (0.0026 J)	0.0058	0.0057	ND	ND (0.00028 J)
	Barium	0.16	0.16		0.013	0.014	0.041	0.031	0.030	0.025	0.027	0.053	0.045	0.033	0.023
	Beryllium	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND (0.000076 J)	ND
	Cadmium	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
<u> </u>	Chromium	ND	ND		ND	ND	ND	ND	ND	ND (0.00091 J)	ND	ND	ND	ND	ND
	Cobalt <sup>+</sup>	ND	ND (0.00014 J)	ND	ND	ND	ND (0.00067 J)	ND (0.00094 J)	ND	ND (0.000056 J)	ND (0.00024 J)	ND	ND (0.00027 J)	ND	ND (0.00034 J)
APPENDIX	Fluoride	ND	ND (0.047 J)		ND	ND	ND (0.23 J)	ND (0.22 J)	ND	ND	0.33	ND (0.14 J)	ND (0.044 J)	ND (0.18 J)	ND (0.065 J)
PPK	Lead	ND	ND		ND	ND	ND	ND	ND	ND	ND (0.000092 J)	ND	ND	ND	ND
<b>(V</b>	Lithium	ND	ND		ND	ND (0.00059 J)	ND (0.0086 J)	ND (0.0073 J)	ND	ND	ND (0.0012 J)	ND (0.0017 J)	ND (0.0012 J)	ND (0.0011 J)	ND (0.00078 J)
	Mercury	ND	ND		ND (0.000065 J)	ND	ND (0.000053 J)	ND	ND	ND	ND	ND (0.000048 J)	ND	ND (0.000058 J)	ND
	<b>Molybdenum</b> <sup>+</sup>	ND	ND (0.0014 J)	ND	ND	ND (0.00053 J)	0.016	0.011	ND	ND (0.00054 J)	ND (0.0027 J)	ND (0.0035 J)	ND (0.0032 J)	ND	ND
	Comb. Radium 226/228	1.43	1.44 U		0.941 U	0.660 U	1.38	1.57	1.03 U	0.474 U	0.225 U	1.88	1.21 U	1.04	0.328 U
	Selenium	ND	ND (0.00011 J)		ND	ND	ND	ND	ND	ND (0.00015 J)	ND (0.00040 J)	ND	ND	ND	ND (0.00040 J)
	Thallium	ND	ND (0.00011 J)		ND	ND	ND	ND (0.000070 J)	ND	ND	ND (0.000065 J)	ND	ND	ND	ND

#### TDS = total dissolved solids

1 of 4

<sup>-- =</sup> Parameter was not analyzed

J = Indicates the parameter was estimated and detected between the method detection limit (MDL) and the reporting limit (RL)

ND = Indicates the parameter was not detected above the analytical MDL

U = Indicates the parameter was not detected above the analytical minimum detectable concentration (MDC) (Specific to combined radium 226/228)

<sup>(1)</sup> Appendix III/IV parameter per 40 CFR 257 Subpart D. Parameters are reported in units of milligrams per liter (mg/L), except for pH reported as s.u. (standard units) and combined radium reported as picocuries per liter (pCi/L).

<sup>(2)</sup> Metals were analyzed by EPA Method 6020B, anions were analyzed by EPA Method 300.0, TDS was analyzed by SM2540C, and combined radium 226/228 by EPA Methods 9315/9320. The pH value presented was recorded at the time of sample collection in the field.

<sup>(3)</sup> Appendix III parameters with a "\*" exhibited statistically significant increases (SSIs) over background concentrations during the October 2017 detection monitoring event. Similarly, Appendix IV parameters with a "+" exhibited statistically significant levels (SSLs) over established Groundwater Protection Standards (GWPS) during the June and October 2018 assessment monitoring events.

<sup>(4)</sup> Well is designated a delineation monitoring well.

<sup>(5)</sup> The value exceeds the Maximum Contaminant Level (MCL) for arsenic (0.010 mg/L). An alternate source demonstration (ASD) was prepared and will be submitted to Georgia EPD in the semiannual groundwater monitoring report on July 31, 2019.

**Table 3**Summary of Groundwater Analytical Data
Plant Bowen AP-1, Bartow County, Georgia



	Well ID:	BGWC-14	BGWC-14	BGWC-16	BGWC-16	BGWC-17	BGWC-17	BGWC-18	BGWC-18	BGWC-19	BGWC-19	BGWC-20	BGWC-20	BGWC-21
	Sample Date:	3/6/2019	4/4/2019	2/25/2019	4/2/2019	2/27/2019	4/2/2019	2/27/2019	4/2/2019	3/1/2019	4/3/2019	2/27/2019	4/3/2019	4/3/2019
	Parameter (1,2,3)													
11	Boron*		ND (0.79 J)		1.1		ND (0.95 J)		ND (0.56 J)		0.51		2.6	0.12
	Calcium*		98.0		117		63.9		53.3		51.3		220	43.4
APPENDIX III	Chloride*		33.7		20.3		18.7		4.5		9.7		144	5.0
ND.	Fluoride*	0.88	0.44	ND (0.13 J)	ND (0.23 J)	ND (0.26 J)	ND (0.14 J)	ND	ND (0.044 J)	ND (0.14 J)	ND (0.051 J)	ND (0.13 J)	ND (0.072 J)	ND (0.032 J)
PPE	pH*	7.33	7.33	6.74	6.75	7.38	7.22	6.58	6.48	6.70	6.58	7.26	7.14	7.69
A	Sulfate*	1	255		272		86.9		70.1		90.6		593	61.9
	TDS*		617		604		321		258		259		1090	244
	Antimony	ND		ND		ND		ND		ND		ND		
	Arsenic	ND (0.0015 J)	ND (0.00041 J)	ND	ND (0.00030 J)	ND (0.0010 J)	ND (0.00024 J)	ND (0.00083 J)	ND (0.00015 J)	ND	ND (0.00017 J)	ND (0.0014 J)	ND (0.00027 J)	ND (0.00038 J)
	Barium	0.065	0.049	0.028	0.025	0.014	0.015	0.027	0.028	0.028	0.033	0.032	0.029	0.033
	Beryllium	ND	ND	ND (0.000087 J)	ND (0.000063 J)	ND	ND	ND (0.00011 J)	ND (0.000052 J)	ND	ND	ND	ND	ND
	Cadmium	ND	ND	0.0016	0.0014	ND	ND	ND	ND (0.000073 J)	ND	ND	ND	ND	ND
IX	Chromium	ND	ND (0.00057 J)	ND	ND	ND	ND (0.00044 J)	ND	ND	ND	ND	ND (0.0048 J)	ND (0.00088 J)	ND
	Cobalt <sup>+</sup>	ND	ND (0.00015 J)	ND (0.0071 J)	ND (0.0056 J)	ND	ND (0.00015 J)	ND	ND (0.00012 J)	ND	ND (0.000072 J)	ND	ND (0.00024 J)	ND (0.00064 J)
APPENDIX	Fluoride	0.88	0.44	ND (0.13 J)	ND (0.23 J)	ND (0.26 J)	ND (0.14 J)	ND	ND (0.044 J)	ND (0.14 J)	ND (0.051 J)	ND (0.13 J)	ND (0.072 J)	ND (0.032 J)
PPE	Lead	ND	ND	ND	ND	ND	ND	ND	ND (0.000081 J)	ND	ND	ND	ND	ND (0.000068 J)
A	Lithium	ND	ND	ND	ND (0.00049 J)	ND	ND (0.00069 J)	ND	ND	ND	ND	ND (0.015 J)	ND (0.012 J)	ND
	Mercury	ND	ND	ND	ND	ND (0.00029 J)	0.00040	ND (0.000079 J)	ND	ND (0.000050 J)	ND	ND (0.000066 J)	ND	ND
	Molybdenum <sup>+</sup>	0.013	ND (0.0088 J)	ND	ND	ND	ND	ND	ND	ND	ND (0.00023 J)	0.013	0.012	ND (0.0019 J)
	Comb. Radium 226/228	9.46	8.48	1.08	1.73	1.57	0.710 U	1.12	0.814 U	0.989 U	0.980 U	1.24	0.567 U	0.532 U
	Selenium	ND	ND (0.00014 J)	ND	ND (0.00060 J)	ND	ND (0.00077 J)	ND	ND (0.0010 J)	ND	ND (0.00058 J)	ND	ND	ND (0.00012 J)
	Thallium	ND	ND	ND (0.00023 J)	ND (0.00020 J)	ND	ND (0.000075 J)	ND	ND	ND	ND	ND	ND	ND

TDS = total dissolved solids

- U = Indicates the parameter was not detected above the analytical minimum detectable concentration (MDC) (Specific to combined radium 226/228)
- (1) Appendix III/IV parameter per 40 CFR 257 Subpart D. Parameters are reported in units of milligrams per liter (mg/L), except for pH reported as s.u. (standard units) and combined radium reported as picocuries per liter (pCi/L).
- (2) Metals were analyzed by EPA Method 6020B, anions were analyzed by EPA Method 300.0, TDS was analyzed by SM2540C, and combined radium 226/228 by EPA Methods 9315/9320. The pH value presented was recorded at the time of sample collection in the field.
- (3) Appendix III parameters with a "\*" exhibited statistically significant increases (SSIs) over background concentrations during the October 2017 detection monitoring event. Similarly,
- Appendix IV parameters with a "+" exhibited statistically significant levels (SSLs) over established Groundwater Protection Standards (GWPS) during the June and October 2018 assessment monitoring events.

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- (4) Well is designated a delineation monitoring well.
- (5) The value exceeds the Maximum Contaminant Level (MCL) for arsenic (0.010 mg/L). An alternate source demonstration (ASD) was prepared and will be submitted to Georgia EPD in the semiannual groundwater monitoring report on July 31, 2019.

<sup>-- =</sup> Parameter was not analyzed

J = Indicates the parameter was estimated and detected between the method detection limit (MDL) and the reporting limit (RL)

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**Table 3**Summary of Groundwater Analytical Data
Plant Bowen AP-1, Bartow County, Georgia



	Well ID:	BGWC-22	BGWC-22	BGWC-22	BGWC-23	BGWC-23	BGWC-24	BGWC-24	BGWC-25	BGWC-25	BGWC-30	BGWC-30	BGWA-6 <sup>(4)</sup>
	Sample Date:	3/1/2019	4/3/2019	5/2/2019	3/1/2019	4/3/2019	3/1/2019	4/3/2019	3/1/2019	4/4/2019	3/1/2019	4/2/2019	4/2/2019
	Parameter (1,2,3)												
Ш	Boron*		7.9	10.1		6.5		23.3		ND (0.020 J)		ND (6.1 J)	ND (0.037 J)
	Calcium*		458	647		396		945		54.8		181	64.1
	Chloride*		856	999		679		1890		3.8		333	9.0
(ND	Fluoride*	0.34	ND (0.23 J)	1.4	0.38	ND (0.10 J)	1.0	3.0	ND (0.12 J)	ND	ND (0.24 J)	0.68	ND
APPENDIX	рН*	6.90	6.77	6.92	7.16	7.00	6.57	6.57	7.50	7.38	7.32	7.22	7.24
A	Sulfate*		720	827		603		648		11.4		153	29.8
	TDS*		2180			1990		ND (13.0 J)		196		773	295
	Antimony	ND			ND		ND		ND		ND		
	Arsenic	ND (0.0011 J)	ND (0.0021 J)	ND	ND (0.0023 J)	ND (0.00093 J)	ND (0.0032 J)	ND (0.0019 J)	ND (0.0022 J)	ND (0.0016 J)	ND	ND (0.00024 J)	ND (0.00032 J)
	Barium	0.087	0.082		0.097	0.087	0.12	0.095	0.021	0.016	0.078	0.075	0.011
	Beryllium	ND (0.00012 J)	ND (0.000067 J)		ND	ND	ND	ND	ND	ND	ND	ND	ND
	Cadmium	ND (0.00013 J)	ND		ND (0.00019 J)	ND	0.0058	0.0053	ND	ND	ND	ND (0.000079 J)	ND
2	Chromium	ND	ND	ND	ND (0.0033 J)	ND (0.00057)	ND	ND	ND	ND	ND	ND (0.00095 J)	ND
	Cobalt <sup>+</sup>	0.017	0.019	0.023 J	ND	ND (0.00058)	ND (0.0055 J)	ND (0.0048 J)	ND	ND (0.00022 J)	ND	ND (0.00022 J)	ND (0.00016 J)
APPENDIX	Fluoride	0.34	ND (0.23 J)	1.4	0.38	ND (0.10 J)	1.0	3.0	ND (0.12 J)	ND	ND (0.24 J)	0.68	ND
PPE	Lead	ND (0.00033 J)	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND (0.000070 J)
A	Lithium	ND (0.022 J)	ND (0.024 J)		ND (0.017 J)	ND (0.013 J)	ND (0.0068 J)	ND (0.0048 J)	ND	ND	ND (0.0044 J)	ND (0.0041 J)	ND
	Mercury	ND (0.000042 J)	ND		ND (0.000044 J)	ND	0.00093	0.0013	ND (0.000047 J)	ND	ND (0.00010 J)	ND	ND
	Molybdenum <sup>+</sup>	0.039	0.039	0.043	0.013	0.012	ND	ND (0.00095 J)	ND	ND (0.00096 J)	0.011	0.010	ND (0.00026 J)
	<b>Comb. Radium 226/228</b>	3.32	2.48		2.24	2.86	3.37	3.60	0.634 U	0.346 U	2.47	2.29	0.640 U
	Selenium	ND	ND	ND	ND	ND	ND	ND (0.0038 J)	ND	ND	ND (0.010 J)	ND (0.0092 J)	ND (0.00031 J)
	Thallium	ND (0.00074 J)	ND (0.00070 J)		ND	ND	ND (0.00070 J)	ND (0.00064 J)	ND	ND	ND (0.00024 J)	ND (0.00024 J)	ND (0.000062 J)

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<sup>-- =</sup> Parameter was not analyzed

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**Table 3**Summary of Groundwater Analytical Data
Plant Bowen AP-1, Bartow County, Georgia



	Well ID:	BGWA-33 <sup>(4)</sup>	BGWC-31 <sup>(4)</sup>	BGWC-32 <sup>(4)</sup>	BGWC-32	BGWC-34D <sup>(4)</sup>	BGWC-35D <sup>(4)</sup>	BGWC-36D <sup>(4)</sup>	BGWC-37D <sup>(4)</sup>	BGWC-38D <sup>(4)</sup>
	Sample Date:	4/3/2019	4/4/2019	4/5/2019	5/3/2019	4/4/2019	4/4/2019	4/2/2019	5/3/2019	5/2/2019
	Parameter (1,2,3)									
	Boron*	0.66	ND (0.59 J)	ND (4.6 J)	3.4	0.15	8.3	ND (6.7 J)		
III XI	Calcium*	44.9	69.3	265	203	104	442	200		
	Chloride*	5.2	32.7	270	257	28.4	605	378		
	Fluoride*	ND (0.085 J)	ND	0.66	1.3	ND (0.035 J)	ND (0.26 J)	0.44		
APPENDIX	pH*	7.67	7.19	7.28	7.18	7.32	7.20	6.48	7.51	7.32
AI	Sulfate*	26.2	105	312	304	88.0	643	192		
	TDS*	235	350	1160	1	419	1930	976		
	Antimony									
	Arsenic	ND (0.0020 J)	ND (0.0036 J)	ND (0.00093 J)		0.015 <sup>(5)</sup>	ND (0.0018 J)	ND (0.00039 J)		
	Barium	0.25	0.032	0.085		0.031	0.071	0.074		
	Beryllium	ND	ND	ND		ND	ND	ND (0.000070 J)		
	Cadmium	ND	ND	ND		ND	ND	ND		
>.	Chromium	ND	ND	ND		ND	ND (0.0011 J)	ND (0.0010 J)		
×	Cobalt <sup>+</sup>	ND (0.00011 J)	ND (0.00051 J)	0.011	ND (0.0078 J)	ND (0.00042 J)	ND (0.0011 J)	ND (0.0011 J)		
ON CONTRACT	Fluoride	ND (0.085 J)	ND	0.66		ND (0.035 J)	ND (0.26 J)	0.44		
APPENDIX IV	Lead	ND	ND (0.00065 J)	ND		ND (0.000054 J)	ND (0.00023 J)	ND (0.00067 J)		
A	Lithium	ND	ND	ND		ND (0.00068 J)	ND (0.0096 J)	ND (0.0021 J)		
	Mercury	ND	ND	ND		ND	ND	ND		
	Molybdenum <sup>+</sup>	0.034	ND (0.00033 J)	ND (0.0035 J)	ND (0.0048 J)	ND (0.0011 J)	0.030	0.011	0.040	0.11
	Comb. Radium 226/228	0.690 U	1.49	2.20		1.89	2.37	2.81		
	Selenium	ND (0.00013 J)	ND (0.000080 J)	ND (0.00015 J)		ND (0.00010 J)	ND	0.014		
	Thallium	ND	ND	ND (0.00046 J)		ND	ND	ND (0.00022 J)		

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#### TDS = total dissolved solids

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- (1) Appendix III/IV parameter per 40 CFR 257 Subpart D. Parameters are reported in units of milligrams per liter (mg/L), except for pH reported as s.u. (standard units) and combined radium reported as picocuries per liter (pCi/L).
- (2) Metals were analyzed by EPA Method 6020B, anions were analyzed by EPA Method 300.0, TDS was analyzed by SM2540C, and combined radium 226/228 by

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<sup>-- =</sup> Parameter was not analyzed

#### Table 4

Evaluation of Remedial Technologies Plant Bowen AP-1, Bartow County, Georgia



	Regulatory Citation for Criteria:		57.96(C)(1)
Corrective Measure	Description	Performance	Reliability
Geochemical Approaches (In-Situ Injection)	Use of an injection well network, or other means of introducing reagents or air into the subsurface, to provide suitable reagents for either anaerobic or aerobic attenuation of Co and Mo. Under anaerobic conditions, Co would be attenuated within sparingly soluble sulfide minerals; this approach might also increase the attenuation of Mo. Under aerobic conditions, soluble iron or manganese and oxygen (either via air sparging or through a chemical oxidant) would be injected to promote the formation of iron or manganese (oxy-) hydroxides for subsequent sorption of Co (and potentially, Mo) onto these mineral phases. If sufficient iron is present in groundwater, the use of air sparging alone may be considered to precipitate iron (oxy-) hydroxides for sorption. In-situ chemical oxidation (ISCO) or in-situ chemical reduction (ISCR) can be used to chemically alter the redox environment in the subsurface to affect the mobility of certain inorganic compounds, including Co. However, the main attenuation mechanism for Co and Mo is sorption, which is more dependent on pH than redox.	The effective immobilization of Co has been shown under aerobic and anaerobic conditions; however, the anaerobic approach (involving the injection of an electron donor together with iron or manganese and sulfur) requires careful study and testing. While aerobic approaches are somewhat less complex, additional aquifer characterization is needed to further evaluate these options. It is currently not well understood whether molybdenum can be efficiently attenuated using insitu redox manipulations due to slow reaction kinetics. Mo attenuation under both aerobic and anaerobic conditions needs to be further evaluated but is expected to occur. Mo is more strongly sorbed to aluminum oxides than other metal oxides, and it is generally less sorptive and more mobile compared to Co.	Reliability dependent on permeability of the subsurface and the amount and distribution of secondary iron or manganese (oxy-) hydroxides (for aerobic approach), or electron donors and soluble iron or manganese and sulfur that can be consistently distributed (for anaerobic approach). Reliable technology if injected materials can be distributed throughout the impacted aquifer. Bench-and/or pilot-scale treatability testing programs are needed to understand the biogeochemical processes that would effectively reduce migration of Co and Mo in groundwater.
Hydraulic Containment ("Pump and Treat")	Hydraulic containment refers to the use of groundwater extraction to induce a hydraulic gradient for hydraulic capture or control the migration of impacted groundwater. This approach uses extraction wells or trenches to capture groundwater, which may subsequently require above-ground treatment and permitted discharge to a receiving water feature, reinjection into the groundwater, or reuse (e.g., land application, CCR conditioning, etc.). It is applicable to a variable mix of inorganic constituents, including dissolved Co and Mo.	Pump and treat (P&T) is effective at providing hydraulic control, but it is unclear whether full groundwater remediation can be achieved without further understanding attenuation mechanisms at the Site. At AP-1, implementation of the corrective measure is contingent on completing additional assessment activities (i.e. high-resolution site characterization, additional pump tests, flow modeling, and capture zone analysis). This is needed to refine the constituent distribution in the subsurface to target specific zones for pumping for improved mass recovery efficiency/ effectiveness and to further evaluate the potential remedy performance.	Generally reliable for hydraulic containment, but uncertainty exists whether groundwater remediation goals can be achieved within a reasonable time frame without further understanding attenuation mechanisms.
Monitored Natural Attenuation (MNA)	MNA relies on natural attenuation processes to achieve site-specific remediation objectives within a reasonable time frame relative to more active methods. Under certain conditions (e.g., through sorption, mineral precipitation or oxidation-reduction reactions), MNA effectively reduces the dissolved concentrations of inorganic constituents in groundwater. Attenuation mechanisms for inorganic constituents at CCR sites, including cobalt (Co) and molybdenum (Mo) at AP-1, are either physical (e.g. dilution, dispersion, flushing, and related processes) or chemical (e.g., sorption or oxidation reduction reactions). Chemical attenuation processes include precipitation and sorption reactions such as adsorption on the surfaces of soil minerals, absorption into the matrix of soil minerals, or partitioning into organic matter. Further, oxidation-reduction (redox) reactions, via abiotic or biotic processes, can transform the valence states of some inorganic constituents to less soluble and thus less mobile forms. For Co and Mo, the main attenuation processes include sorption to iron and manganese oxides (Co and Mo), aluminum oxides (Mo), and formation of sparingly soluble sulfide minerals (Co).	Physical and chemical MNA mechanisms for Co and Mo, including dilution, dispersion, sorption, and oxidation reduction reactions can be effective at achieving groundwater protection standards (GWPS) within a reasonable time frame. Attenuation processes for Co and Mo are already occurring at the site as evidenced by data from the delineation wells. Source control will improve the mass balance such that the buffer capacity of the aquifer is unlikely to be exhausted, and the attenuation processes already at work for Co and Mo at AP-1 will further enhance ongoing MNA.	Reliable as long as the aquifer conditions that result in Co and Mo attenuation remain favorable and/or are being enhanced and sufficient attenuation capacity is present. MNA is reliable and can either be used as a stand-alone corrective measure for groundwater impacted by dissolved Co and/or Mo, or in combination with a second technology.
Permeable Reactive Barrier	Permeable reactive barrier (PRB) technology typically involves the installation of a permeable subsurface wall constructed with reactive media for the removal of constituents as groundwater passes through. Either ZVI-Carbon matrix or solid carbon (bio-barrier) are currently proposed for the concurrent removal of Co and Mo. The carbon could be composed of peat moss, mulch or another carbon source. Exact placement of the PRB is contingent on finalization of the nature and extent characterization. PRB walls are typically keyed into the bedrock. While the shallow groundwater in the residuum and fractured bedrock is connected to the groundwater in more competent bedrock, the higher permeability/conductivity of the PRB is not expected to impede groundwater flow. PRBs can also be constructed as "funnel and gate" systems, where a barrier wall directs groundwater to a smaller "treatment gate" filled with reactive media.	PRBs have been shown to effectively address Co and Mo in groundwater if the right mix of reactive materials (e.g., ZVI and carbon) is selected for concurrent removal/immobilization of these constituents. The approach is expected to achieve GWPS for both constituents as impacted groundwater passes through the reactive barrier. Molybdenum redox kinetics may be slow and hence a thicker wall might be needed relative to solely treating for Co. Furthermore, additional testing is required to select the appropriate sorptive media mix, especially related to Mo.	Reliable groundwater corrective measure, but loss of reactivity over time may require re-installation depending on the duration of the remedy. Additional data collection, including conducting a bench and/or pilot study, is needed to better characterize current attenuation mechanisms and/or select the appropriate reactive media mix for a PRB wall.
Phytoremediation / TreeWells	Phytoremediation uses trees and other plants to degrade or immobilize constituents or achieve hydraulic control without the need for an above-ground water treatment system and infrastructure. Within the context of AP-1, this corrective measure would likely use an engineered (proprietary) TreeWell® phytoremediation system along the point of compliance or downgradient edge of the impacted groundwater for hydraulic control. The system promotes root development to the targeted groundwater zone (depth), allowing for hydraulic control of impacted groundwater. In addition, immobilization of Co and Mo within the root zone as well as incidental uptake of dissolved Co and Mo with groundwater is expected to occur concurrent with hydraulic control.	Once established (typically at the end of the third growing season), a TreeWell system is effective for providing hydraulic containment of groundwater, and potential reduction of Co and Mo concentrations through immobilization and/or uptake and sequestration in the tree biomass; however, the main purpose is to provide hydraulic control. Given the site-specific hydrogeology and reported Co and Mo groundwater concentrations surrounding AP-1, the approach is currently considered to be applicable in this setting. However, additional aquifer testing and/or groundwater flow modeling may be needed to confirm suitability for the area downgradient of AP-1.	Engineered phytoremediation is a proven technology where hydrogeologic factors are taken into account (e.g., hydraulic conductivity, flow velocity, depth to impacted groundwater zone, etc.). This is considered an active remedial approach through the use of trees as the "pumps" driving the system. Careful design will be needed to select the proper species, which will include consideration of groundwater chemistry, plant uptake of constituents, and groundwater flow modeling to evaluate the required number and placement of TreeWell® units.
Subsurface Vertical Barrier Walls	This approach involves placing a barrier to groundwater flow in the subsurface, frequently around a source area, to prevent future migration of dissolved constituents in groundwater from beneath the source to downgradient areas. In general, barrier walls are designed to provide containment; localized treatment achieved through the sorption or chemical precipitation reactions from construction of the walls are incidental to the design objective. Barrier walls can also be used in downgradient applications; to limit discharge to a surface water feature or to reduce aquifer recharge from an adjacent surface water feature when groundwater extraction wells are placed near one. A variety of barrier materials can be used, including cement and/or bentonite slurries, geomembrane composite materials, or driven materials such as steel or vinyl sheet pile. Groundwater extraction from upgradient of the barrier is required to avoid groundwater mounding behind the barrier.	Barrier walls are a proven technology for seepage control and/or groundwater cutoff at impoundments. Slurry walls are limited by the depth of installation, which is approximately 90 ft bgs. However, site-specific geologic and technology-specific considerations may limit this depth to shallower installations. Within the context of AP-1, a barrier wall might be used in conjunction with a "funnel and gate" system for a PRB rather than a stand-alone technology. As such, groundwater with Co and Mo above GWPS could either be directed to "treatment gates" for passive treatment (in a PRB) or migration of impacted groundwater could be minimized via barrier wall installation. Additional subsurface investigations, aquifer testing, and compatibility testing with site-specific groundwater will be needed.	Generally reliable as a barrier to groundwater flow; however, treatment of downgradient groundwater is incidental and not the primary objective.

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#### Table 4

Evaluation of Remedial Technologies Plant Bowen AP-1, Bartow County, Georgia



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Corrective Measure	40 CFR 257.96(C)(1) Ease of Implementation	40 CFR 257.96(C)(1) Potential Impacts	40 CFR 257.96(C)(2) Time Requirement to Begin/Complete
Geochemical Approaches (In-Situ Injection)	Moderate. Installation of injection well network or other injection infrastructure would be required. Alternative installation approaches may be considered, such as along the downgradient edge of impacted groundwater, which would function similar to a PRB application. Potential for clogging of aquifer matrix and/or injection well infrastructure. Chemical distribution during injections (i.e., radius of influence) needs to be evaluated.	Minimal impacts are expected if remedy works as designed, based on a thorough pre-design investigation, geochemical modeling, and bench/pilot study results. Redox-altering processes have the potential to mobilize naturally-occurring constituents as an unintended consequence if not properly studied and implemented.	Installation of the injection network can be accomplished relatively quickly (1 to 2 months). However, a thorough pre-design investigation, geochemical modeling, and/or bench- and/or pilot-testing will be required to obtain design parameters prior to design and construction of the corrective measure, which may take up to 24 months. Once installed, the time required to achieve GWPS within the treatment area may be relatively quick but depends on the attenuation process kinetics of each targeted constituent. The time for complete distribution of the injected materials throughout the treatment area is also variable.
Hydraulic Containment ("Pump and Treat")	Moderate. Proven approach, and supplemental installation of extraction wells/trenches is fairly straightforward. The extracted groundwater may potentially require an above-ground treatment system. A variety of sorption and precipitation approaches exist for ex-situ treatment of Co and Mo. Operation and maintenance (O&M) requirements are expected to include upkeep of infrastructure components (pumps, pipes, tanks, instrumentation and controls, above-ground treatment system) and handling of treatment residuals.	Moderate. The main potential impacts are related to the presence and operation of an on-site above-ground water treatment facility and related infrastructure to convey and treat extracted groundwater. Pumping activity may unintentionally alter the geochemistry within the hydraulic capture zone.	Installation of extraction wells and/or trenches can be accomplished relatively quickly (1 to 2 months). However, additional aquifer testing, system design and installation, and permit approval may be required, which may take up to 24 months. The initiation of the approach would be contingent on the start-up of the wastewater treatment infrastructure. Hydraulic containment can be achieved relatively quickly after startup of the extraction system, but uncertainty exists with respect to the time to achieve GWPS without additional data collection to better understand attenuation mechanisms for Co and Mo.
Monitored Natural Attenuation (MNA)	Reasonably implementable with respect to infrastructure, but moderate to complex with respect to documentation. Proven approach, but additional data are needed to show that the existing attenuation capacity is sufficient to meet site objectives within a reasonable timeframe. A monitoring well network already exists to implement future groundwater monitoring efforts.	None. MNA relies on the natural processes active in the aquifer matrix to reduce constituent concentrations without disturbing the surface or the subsurface.	The infrastructure to initiate MNA is already in place. Demonstrating attenuation mechanisms and capacity can be time-consuming and can take up to 24 months. MNA is expected to be successful within a reasonable time frame following pond closure. Engineering measures will be implemented during closure of AP-1 to minimize potential impacts to the subsurface during closure activities and routine groundwater monitoring will be used to verify that groundwater impacts remain stable or decrease over time.
Permeable Reactive Barrier	Moderate to difficult. Trenching would be required to install a mix of reactive materials in the subsurface. Continuous trenching may be the most feasible construction method. Site-specific geology (i.e., partially weathered bedrock layer) poses a possible constructability challenge when attempting to key PRB material into competent bedrock. Installation methods and materials are readily available. Once installed, treatment will be passive and O&M requirements are minimal if replacement of the PRB is not necessary.	Minimal impacts are expected following the construction of the remedy. However, ZVI has the potential to create anaerobic conditions downgradient of the PRB wall that may mobilize redox-sensitive naturally-occurring constituents. These conditions need to be carefully monitored. Short-term impacts during the construction of the remedy can be mitigated through appropriate planning and health and safety measures.	Installation of a PRB can be accomplished relatively quickly (6 to 12 months), depending on the final location and configuration. However, bench- and/or pilottesting would be required to obtain design parameters prior to design and construction of the remedy, which may take up to 24 months. Once installed, the time to achieve GWPS downgradient of the PRB is anticipated to be relatively quick.
Phytoremediation / TreeWells	Reasonably implementable to moderate. Engineered approach has been proven effective, and specific depth zones can be targeted. Trees are installed as "tree wells" in a large diameter boring to get the roots deep enough to intercept impacted groundwater flow paths. Area must be clear of above- and belowground structures (i.e., power lines). The system, once established (approximately three growing seasons), is a self-maintaining, sustainable remedial system that has no external energy requirements and little maintenance (i.e., efforts normally associated with landscaping).	Minimal impacts are expected. In fact, there are several positive impacts expected, including enhanced aesthetics, wildlife habitat, and limited energy consumption.	The design phase will require some groundwater modeling for optimal placement of the TreeWell units, which may take up to 6 months. Depending on the number of required units, the installation effort is expected to last several weeks. Hydraulic capture/control is expected approximately three years after planting and system performance is expected to further improve over time.
Subsurface Vertical Barrier Walls	Moderate to difficult. Trenching will be required to fill in the various slurry mixes; alternatively, sheet pile installations can be accomplished without excavation of trenches. The application of barrier walls is limited by the depth of installation, which similar to PRBs, should be keyed into a low permeability layer such as a thick clay layer or bedrock. Installation methods and materials are readily available. Once installed, above-ground infrastructure to pump and treat groundwater will be required. O&M requirements are expected to include upkeep of infrastructure components (pumps, pipes, tanks, instrumentation and controls, above-ground treatment system) and handling of treatment residuals.	Minimal impacts are expected following the construction of the remedy. Short-term impacts during the construction of the remedy can be mitigated through appropriate planning and health and safety measures. Changes to groundwater flow patterns due to installation of the barrier wall are expected, which can affect other aspects of groundwater corrective action. Pumping activity may unintentionally alter the geochemistry within the hydraulic capture zone that may result in the mobilization of other constituents that may require treatment.	Installation of a barrier wall can be accomplished relatively quickly (6 to 12 months), depending on the final location and configuration. However, some design phase and additional aquifer and compatibility testing will be required, which may take up to 24 months. Once installed, preventing migration of constituents dissolved in groundwater is anticipated to be relatively quick. Since this approach does not treat the downgradient area of impacted groundwater but prevents migration from a source area, it will likely have to be maintained long-term and coupled with other approaches.

Page 2 of 3

## Table 4

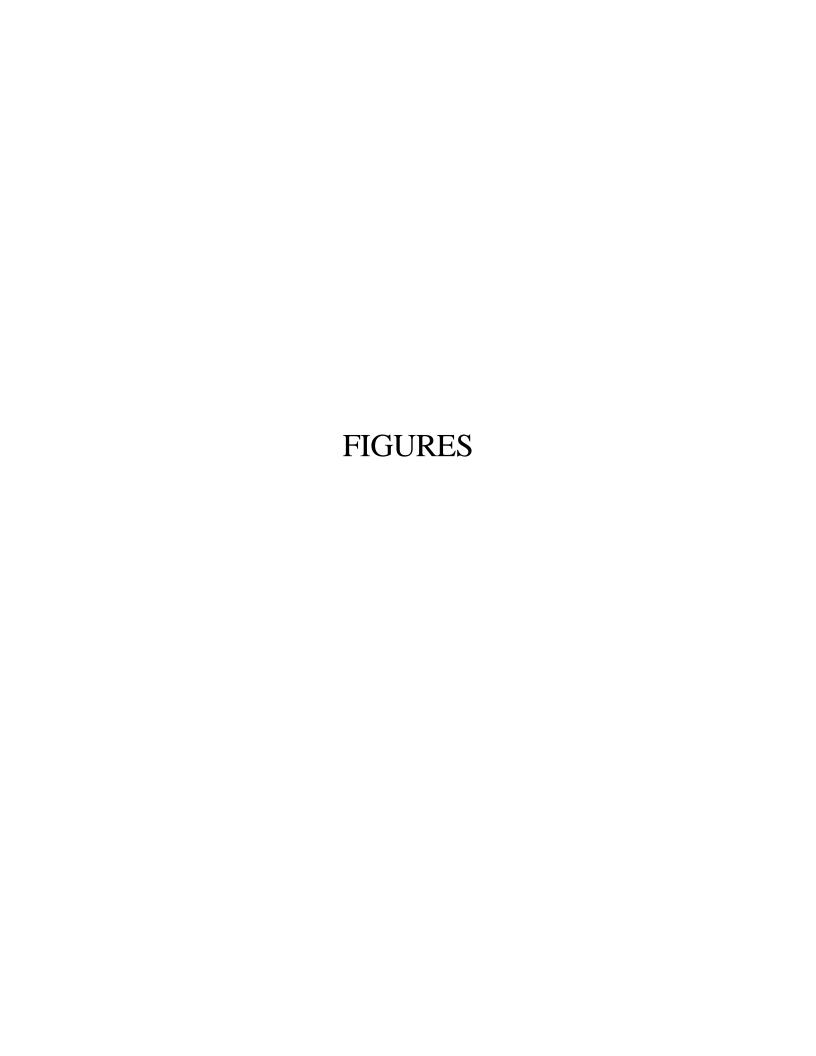
Evaluation of Remedial Technologies Plant Bowen AP-1, Bartow County, Georgia

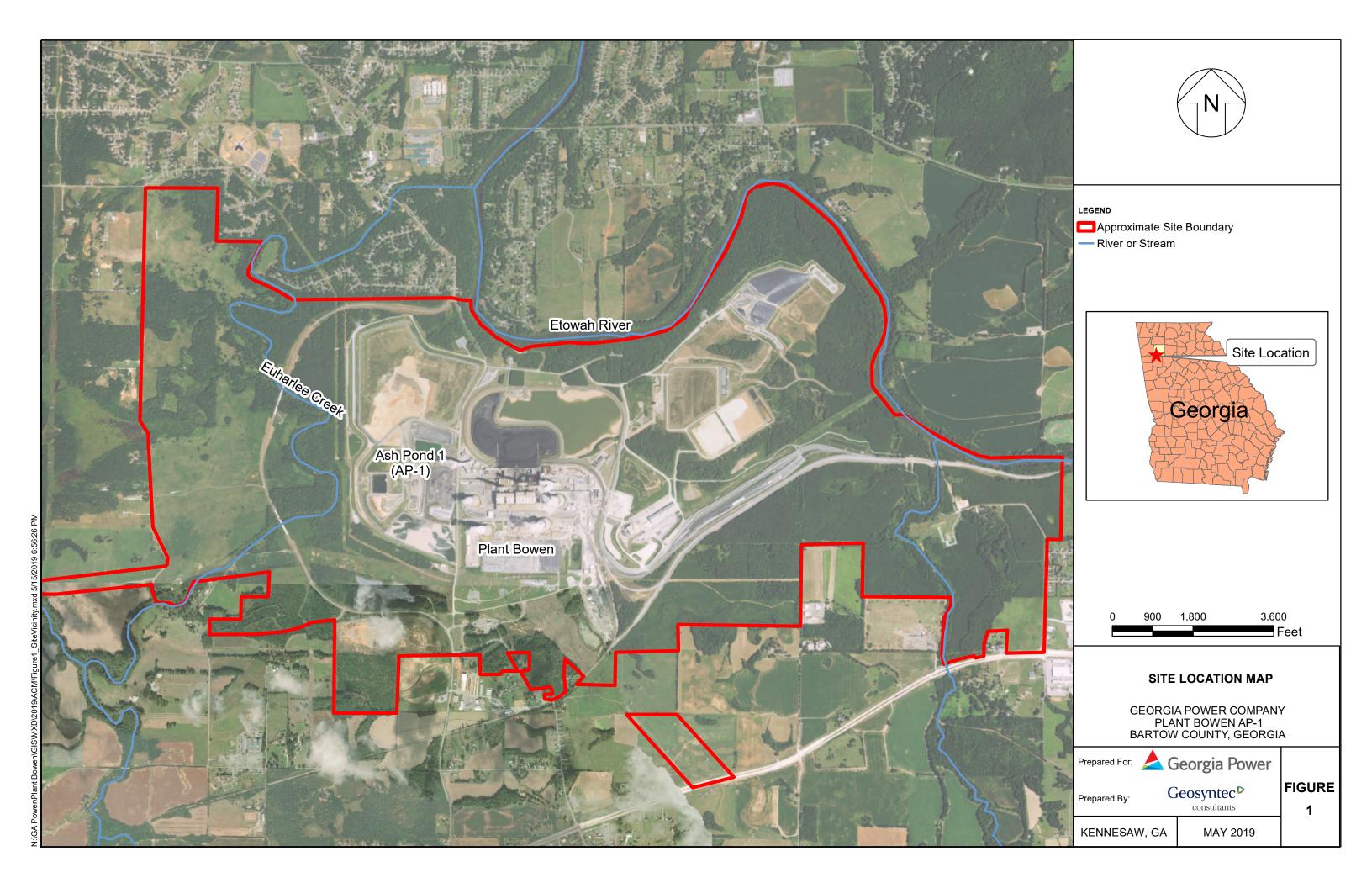


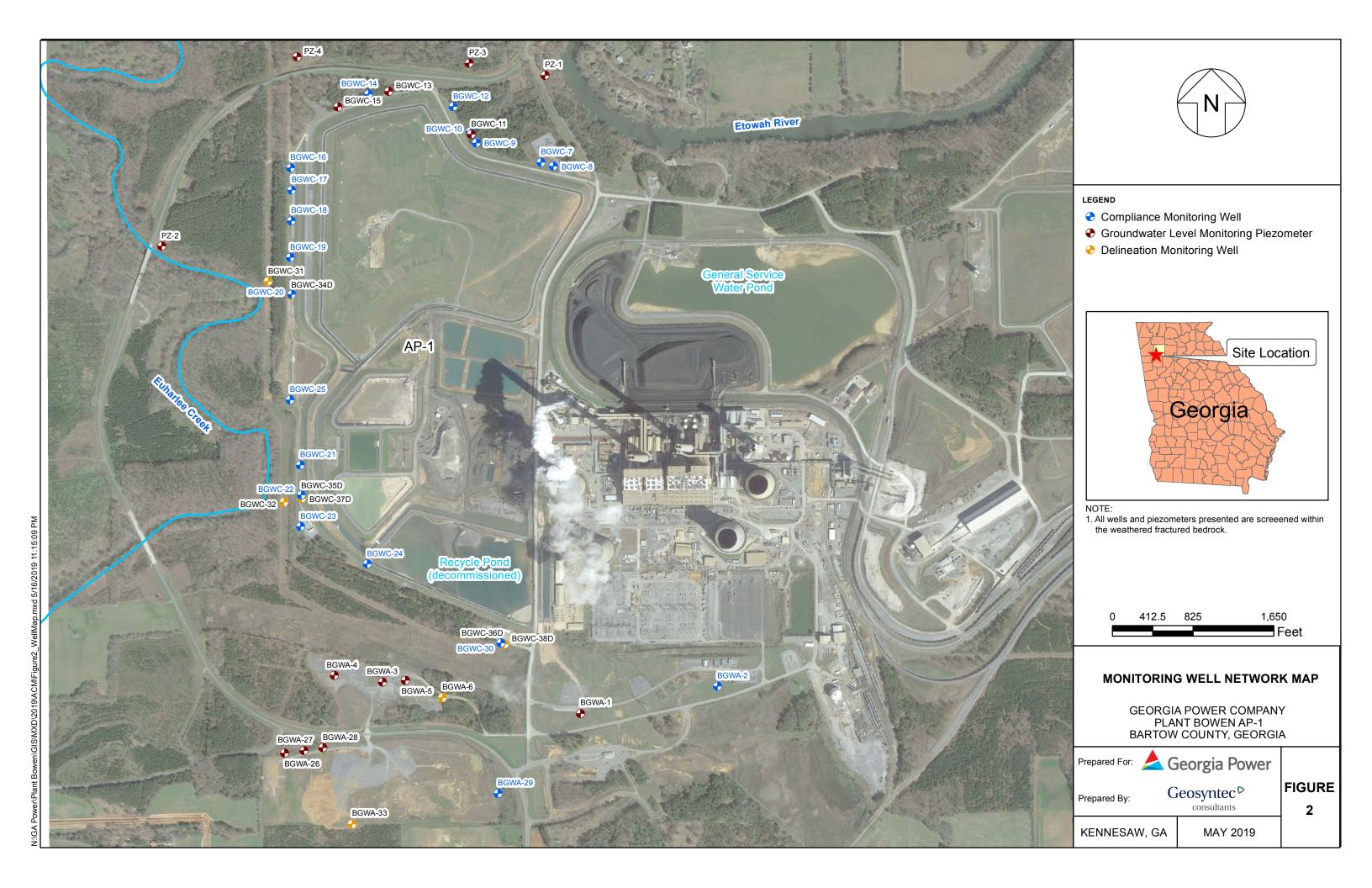
June 2019

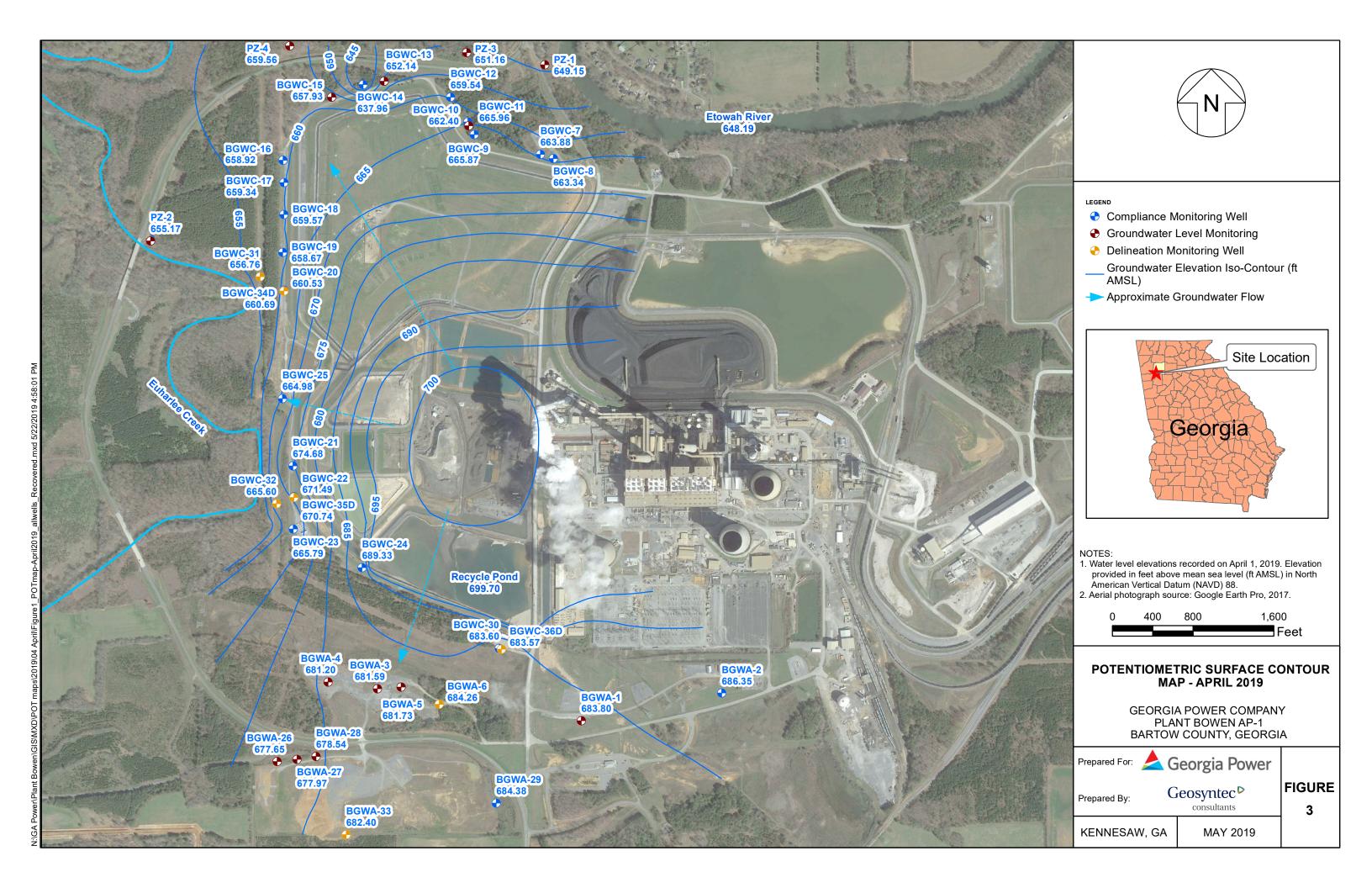
		57.96(C)(3)	
Corrective Measure	Institutional Requirements	Other Env or Public Health Requirements	Relative Costs
Geochemical Approaches (In-Situ Injection)	Deed restrictions may be necessary until in-situ treatment has achieved GWPS.  A new UIC permit (for in-situ injections) would be required to implement this corrective measure. No other institutional requirements are expected at this time.	None expected at this point. Based on downgradient sampling results near adjacent water features, there currently are no complete exposure pathways for potential receptors downgradient of AP-1. Potential mobilization of redox-sensitive constituents exists during implementation of an anerobic attenuation approach. Following installation, the remedy is passive.	Medium (depending on expanse of injection network required and injectate volume required per derived design parameters)
Hydraulic Containment ("Pump and Treat")	Depending on the effluent management strategy, modifications to the existing NPDES permit may be required, or obtaining a new underground injection control (UIC) permit may be needed if groundwater reinjection is chosen. In addition, deed restrictions may be required as long as groundwater conditions are above regulatory standards for unrestricted use.	Based on downgradient sampling results near adjacent water features, there currently are no complete exposure pathways for potential receptors downgradient of AP-1. Above-ground treatment components may need to be present for an extended period of time, generating residuals requiring management and disposal.	Medium to high (depending on remedy duration, complexity of above-ground treatment system, and volume of water processed)
Monitored Natural Attenuation (MNA)	MNA may require the implementation of institutional controls, such as deed restrictions, to preclude potential exposure to groundwater within the footprint of impacted groundwater until GWPS are achieved.	Little to no physical disruption to remediation areas and no adverse construction- related impacts are expected on the surrounding community. Based on downgradient sampling results near adjacent water features, there currently are no complete exposure pathways for potential receptors downgradient of AP-1.	Low to medium
Permeable Reactive Barrier	Deed restrictions may be necessary for groundwater areas upgradient of the PRB (if not installed along the waste boundary). No other institutional requirements are expected at this time.	None expected at this point. Based on downgradient sampling results near adjacent water features, there currently are no complete exposure pathways for potential receptors downgradient of AP-1. Following installation, the remedy is passive. However, certain treatment media (such as ZVI) have the potential to mobilize naturally-occurring constituents downgradient of the PRB.	Medium to high (for installation) - minimal O&M requirements if replacement is not necessary
Phytoremediation / TreeWells	Deed restrictions may be necessary for groundwater areas upgradient of the TreeWell system. No other institutional requirements are expected at this time.	None expected at this point. Based on downgradient sampling results near adjacent water features, there currently are no complete exposure pathways for potential receptors downgradient of AP-1. Innovative and green technology may be positively received by various stakeholders. Following installation, the remedy is passive and does not require external energy.	Medium (for installation) - minimal O&M requirements
Subsurface Vertical Barrier Walls	Deed restrictions may be necessary for groundwater areas downgradient of the barrier wall until remedial goals are met. No other institutional requirements are expected at this time.	Based on downgradient sampling results near adjacent water features, there currently are no complete exposure pathways for potential receptors downgradient of AP-1. Due to the need for groundwater extraction associated with barrier walls, above-ground treatment components may need to be present for an extended period of time, generating residuals requiring management and disposal.	Medium to high (depending on length and depth of wall, remedy duration and complexity of above-ground treatment system)

Page 3 of 3









# APPENDIX A

Boring and Well Construction Logs

LOG

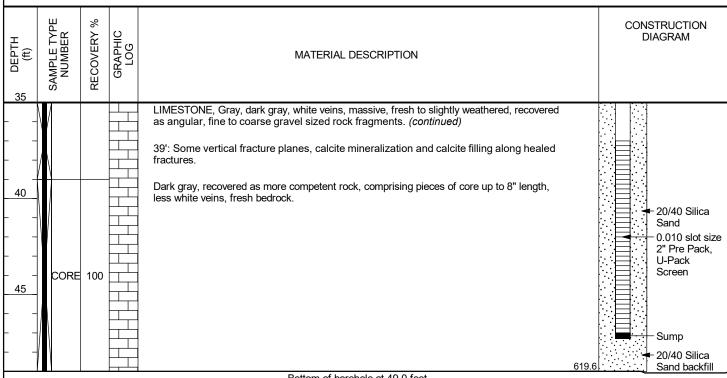
ASHWINS

Geosyntec Consultants 1255 Roberts Boulevard Kennesaw, GA 30144

PAGE 2 OF 2

PROJECT NAME Plant Bowen CLIENT Southern Company Services

PROJECT NUMBER GR6682 PROJECT LOCATION Euharlee Georgia



Bottom of borehole at 49.0 feet.

39': Dark gray, only occasional veins of calcite, massive, fresh.

Bottom of borehole at 49.0 feet.

20/40 Silica Sand 0.010 slot size 2" Pre Pack,

U-Pack

Screen

Sump 20/40 Silica Sand backfill

40

45

CORE

50

64': Increased white calcite veins along sealed fractures and secondary mineralization along fracture planes, recovered as more compact and larger pieces of core up to 4" in length.

67': Recovered as fine to coarse angular gravel and cobble sized fragments of core.

71': Brown orange (iron oxide) staining.

ASHWINS LOG 20180112 PLANT BOWEN LOGS.GPJ ACP GINT LIBRARY.GLB 12/20/18

65

70

CORE 80

CORE 100

20/40 Silica

Geo	osyn consult	tec	Geo	psyntec Consultants 15 Roberts Boulevard	BGWC-34D PAGE 3 OF 3
engineers	scientists   in	novators		nnesaw, GA 30144	
CLIEN	T South	ern C	ompan	y Services PROJECT NAME Plant Bowen	
PROJE	ECT NUM	BER	GR66	682 PROJECT LOCATION Euharlee C	Georgia
DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
				LIMESTONE, Dark gray, massive with white veins, fresh to slightly weathered, record as discs of core up to 2" thick and angular fine to coarse gravel. (continued)  Orange, red and brown (iron oxide) staining.	Sump 
				Bottom of borehole at 78.0 feet.	Sand backfill

ASHWINS LOG

PAGE 2 OF 3

consultants
Geosyntec Consultants
1255 Roberts Boulevard
Kennesaw, GA 30144

CLIENT Southern Company Services PROJECT NAME Plant Bowen PROJECT NUMBER GR6682 **PROJECT LOCATION** Euharlee Georgia SAMPLE TYPE NUMBER CONSTRUCTION GRAPHIC LOG RECOVERY DIAGRAM DEPTH (ft) MATERIAL DESCRIPTION LIMESTONE, Dark gray, massive, some orange (iron oxide) staining and some mineralization of calcite. recovered as fine to coarse gravel, angular and disc shaped pieces of core up to 1" length. (continued) 37': Dark gray with white quartz filled veins and secondary calcite mineralization along fracture lanes/surfaces. 654.3 POTENTIAL VOID (39'-42'). 40 Driller reports soft drilling 651.3 LIMESTONE, Gray, dark gray massive with white quartz veins and secondary calcite Bentonite 3/8" mineralization, fresh. chips CORE 70 45 Dark gray, massive sections with no to minor white veins in upper part of run, increased 50 white, secondary calcite mineralization in lower parts of run, fresh to slightly weathered. CORE 25 55 59': Gray, dark gray with white veins and secondary mineralization along fractured planes/ 60 surfaces, recovered as rounded gravel and pebbles of limestone. 62': White calcareous and quartz rich veins, recovered as angular and subangular gravel and cobbles. CORE 60 65 69': Dark gray, recovered as angular fine to coarse grained gravel and cobbles, massive, 70 fresh with white calcite veins. 20/40 Silica Sand 0.010 slot size 2" Pre Pack, U-Pack

629.2 POTENTIAL VOID (69'-72'). Driller reports very low resistance during drilling. 626.2 LIMESTONE, Gray, white massive, fresh to slightly weathered, medium to high strength, coarse gravel sized, angular, recovered as disc shaped core fragments up to 2" length.

LIMESTONE, Gray, white spotted and calcareous veins throughout, massive fresh, high

Potential SILT. Driller reports very low resistance during drilling.

strength, recovered as angular rock core fragments, up to 3" length.

Bentonite 3/8"

chips

634.2

20180112 PLANT BOWEN LOGS.GPJ ACP GINT LIBRARY.GLB

ASHWINS LOG

60

65

70

CORE 50

70 CORE

ASHWINS\_LOG 20180112\_PLANT BOWEN LOGS.GPJ ACP GINT LIBRARY.GLB 12/20/18

5/8/19

GW6581C\_PLANT BOWEN DEEP WELL INSTALL\_APRIL 2019.GPJ ACP GINT LIBRARY\_FROM ASHWIN.GLB

GEORGIA

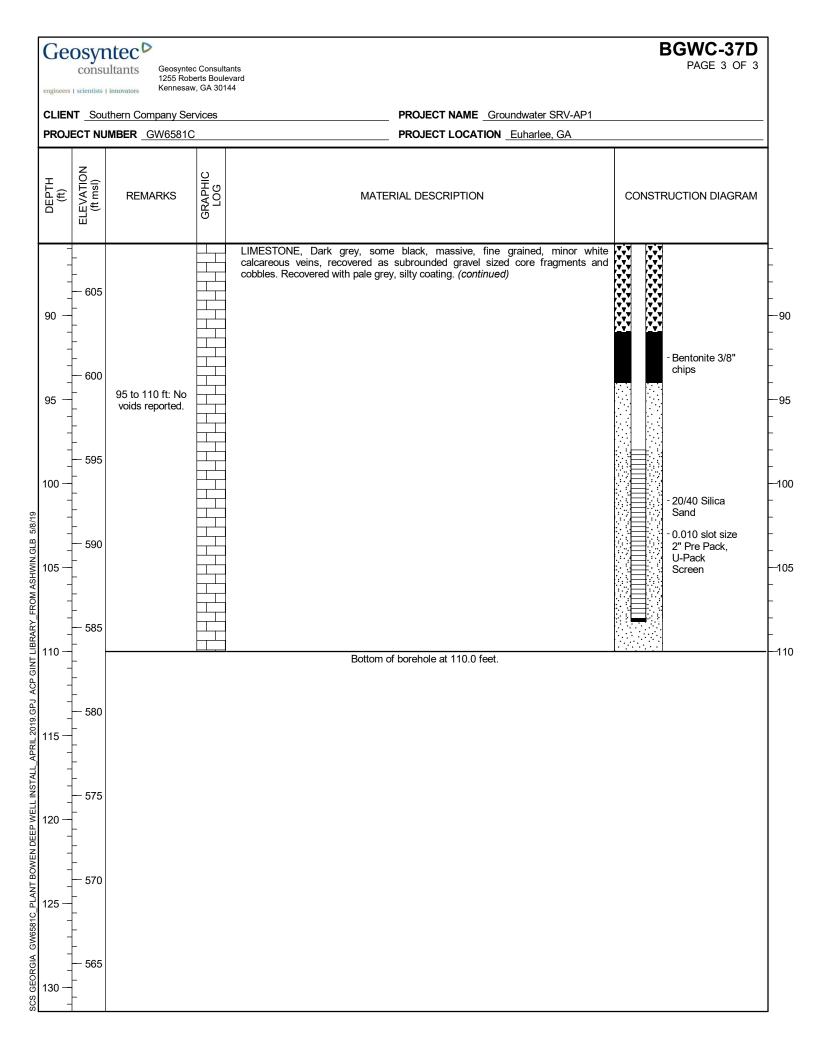
Geosyntec Consultants 1255 Roberts Boulevard Kennesaw, GA 30144 BGWC-37D

PAGE 2 OF 3

CLIENT Southern Company Services

PROJECT NAME Groundwater SRV-AP1

PRO	JECT NU	IMBER GW6581C	;	PROJECT LOCATION Euharlee, GA						
DEPTH (ft)	ELEVATION (ft msl)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM					
45 -		25 to 35 ft: No voids reported.		LIMESTONE, Dark grey, minor white calcareous veins, massive, fine grained, recovered as angular fragments and disc shaped pieces of rock up to 4 inch in diameter. (continued) 41 ft: With white, calcareous mineralization along healed fracture planes.			-4 - - - - -4 -			
50 -		No recovery, run was not lost in hole. Very soft drilling with some resistance.		54 ft: Dark grey, some calcareous veins and secondary mineralization along fracture planes, fresh, moderate strength.  NO RECOVERY (55 to 65 ft)			- - - - - - - -			
90 65 – – – – – – – – – – – – – – – – – –	635      _ 630 	65 to 75 ft: No voids reported.		LIMESTONE, Dark grey, some black, massive, fine grained, minor white calcareous veins, recovered as subrounded gravel sized core fragments and cobbles. Recovered with pale grey, silty coating.  Minor yellowish-brown iron oxide staining at 65 ft.			- - - - - - - -			
	625	75 to 85 ft: No voids reported.				- Bentonite uncoated 3/8" chips	- - - - - - -			
70 - 75 - 75 - 80 - 80 - 85 - 85 - 85 - 85 - 85 - 8	615	85 to 95 ft: No voids reported.		With pale grey, silty coating and some secondary calcite mineralization along fracture planes.			- - - - - - -			



GEORGIA GW6581C PLANT BOWEN DEEP WELL INSTALL APRIL 2019.GPJ ACP GINT LIBRARY, FROM ASHWIN.GLB

GW6581C\_PLANT BOWEN DEEP WELL INSTALL\_APRIL 2019.GPJ ACP GINT LIBRARY\_FROM ASHWIN.GLB

SCS GEORGIA 85

PAGE 2 OF 3 Geosyntec Consultants 1255 Roberts Boulevard Kennesaw, GA 30144 **CLIENT** Southern Company Services **PROJECT NAME** Groundwater SRV-AP1 PROJECT NUMBER GW6581C PROJECT LOCATION Euharlee, GA LEVATION (ft msl) DEPTH (ft) GRAPHII LOG **REMARKS** MATERIAL DESCRIPTION CONSTRUCTION DIAGRAM CLAY, Reddish-brown, some yellow, low to medium plasticity, trace fine sand, moist. With fine, angular gravel sized chert and dolomite fragments, pale grey to white, angular. (continued) 655 43 ft: Dark grey, angular limestone fragments up to 5 inches long. 45 45 45 ft: Angular limestone fragment, 5 inches x 3 inches. 650 48-49 ft: With fine to coarse grainded gravel sized limestone fragments, angular, grey, up to 5 inches in diameter. 50 51 ft: Large, angular chert fragment, white to pale grey, 5 inches in diameter. 645 53 ft: Angular limestone fragment, 4 inches long. 55 Bentonite 55 grout 56 ft: With dark brown SANDY CLAY, sand is fine to coarse grained, subangular, 640 quartz From 57 ft: CLAY with SAND, Brown red and yellow, medium to high plasticity, sand is fine to medium grained, subangular, trace of fine limestone gravel. 60 60 635 63 to 64 ft: Lens of fine to coarse gravel sized limestone fragments in sandy, silty clay matrix. 65 65 67 to 77 ft: Driller reports general 'easy' drilling, with LIMESTONE, Dark grey, grey, white, massive, with calcareous veins, 630 softer and harder minor yellowish-brown iron oxide staining, drilled as angular fragments of patches. rock and disc shaped core fragments, with some chert rich fragments. 70 70 Driller reports rods dropping between 74 and 76 ft, no Potential VOID (74 to 76 ft) 75 resistance. 75 Softer and harder LIMESTONE, Dark grey, grey, white, massive, with calcareous veins, drilling, but no rod minor yellowish-brown iron oxide staining, drilled as angular fragments of 620 dropping. rock and disc shaped core fragments, with some chert rich fragments. 80 Bentonite 80 uncoated 3/8" chips

Bottom of borehole at 127.0 feet.

-125

125

130

570

# APPENDIX B

Laboratory Analytical Reports

Full Appendix IV Scan Sampling Event February-March 2019





March 06, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

## Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on February 27, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Maria Padilla, Georgia Power Rebecca Thornton, Pace Analytical Atlanta







## **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

**Atlanta Certification IDs** 

110 Technology Parkway Peachtree Corners, GA 30092

Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001

Virginia Certification #: 460204



## **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
2615445001	BGWA-2	Water	02/25/19 11:03	02/27/19 15:43	
2615445002	BGWC-8	Water	02/25/19 13:12	02/27/19 15:43	
2615445003	BGWC-16	Water	02/25/19 15:50	02/27/19 15:43	



## **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2615445001	BGWA-2	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	RLC	1
2615445002	BGWC-8	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	RLC	1
2615445003	BGWC-16	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	RLC	1



## **ANALYTICAL RESULTS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

Date: 03/06/2019 05:35 PM

Sample: BGWA-2	Lab ID:	2615445001	Collecte	ed: 02/25/19	11:03	Received: 02/	27/19 15:43 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/04/19 10:39	03/04/19 20:01	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00057	1	03/04/19 10:39	03/04/19 20:01	7440-38-2	
Barium	0.16	mg/L	0.010	0.00078	1	03/04/19 10:39	03/04/19 20:01	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/04/19 10:39	03/04/19 20:01	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/04/19 10:39	03/04/19 20:01	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/04/19 10:39	03/04/19 20:01	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/04/19 10:39	03/04/19 20:01	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/04/19 10:39	03/04/19 20:01	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/04/19 10:39	03/04/19 20:01	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/04/19 10:39	03/04/19 20:01	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/04/19 10:39	03/04/19 20:01	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/04/19 10:39	03/04/19 20:01	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00050	0.000036	1	02/28/19 11:45	02/28/19 15:40	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	ND	mg/L	0.30	0.029	1		03/04/19 12:54	16984-48-8	



## **ANALYTICAL RESULTS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

Date: 03/06/2019 05:35 PM

Sample: BGWC-8	Lab ID:	2615445002	Collecte	ed: 02/25/19	13:12	Received: 02/	27/19 15:43 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/04/19 10:39	03/04/19 20:23	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00057	1	03/04/19 10:39	03/04/19 20:23	7440-38-2	
Barium	0.030	mg/L	0.010	0.00078	1	03/04/19 10:39	03/04/19 20:23	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/04/19 10:39	03/04/19 20:23	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/04/19 10:39	03/04/19 20:23	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/04/19 10:39	03/04/19 20:23	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/04/19 10:39	03/04/19 20:23	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/04/19 10:39	03/04/19 20:23	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/04/19 10:39	03/04/19 20:23	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/04/19 10:39	03/04/19 20:23	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/04/19 10:39	03/04/19 20:23	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/04/19 10:39	03/04/19 20:23	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	nod: EF	PA 7470A			
Mercury	ND	mg/L	0.00050	0.000036	1	02/28/19 11:45	02/28/19 16:04	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	ND	mg/L	0.30	0.029	1		03/04/19 13:56	16984-48-8	M1



Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

Date: 03/06/2019 05:35 PM

Sample: BGWC-16	Lab ID:	2615445003	Collecte	ed: 02/25/19	15:50	Received: 02/	27/19 15:43 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/04/19 10:39	03/04/19 20:35	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00057	1	03/04/19 10:39	03/04/19 20:35	7440-38-2	
Barium	0.028	mg/L	0.010	0.00078	1	03/04/19 10:39	03/04/19 20:35	7440-39-3	
Beryllium	0.000087J	mg/L	0.0030	0.000050	1	03/04/19 10:39	03/04/19 20:35	7440-41-7	
Cadmium	0.0016	mg/L	0.0010	0.000093	1	03/04/19 10:39	03/04/19 20:35	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/04/19 10:39	03/04/19 20:35	7440-47-3	
Cobalt	0.0071J	mg/L	0.010	0.00052	1	03/04/19 10:39	03/04/19 20:35	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/04/19 10:39	03/04/19 20:35	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/04/19 10:39	03/04/19 20:35	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/04/19 10:39	03/04/19 20:35	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/04/19 10:39	03/04/19 20:35	7782-49-2	
Thallium	0.00023J	mg/L	0.0010	0.00014	1	03/04/19 10:39	03/04/19 20:35	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00050	0.000036	1	02/28/19 11:45	02/28/19 16:06	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	0.13J	mg/L	0.30	0.029	1		03/04/19 14:37	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

Date: 03/06/2019 05:35 PM

QC Batch: 23344 Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury

Associated Lab Samples: 2615445001, 2615445002, 2615445003

METHOD BLANK: 104469 Matrix: Water

Associated Lab Samples: 2615445001, 2615445002, 2615445003

Blank Reporting

Parameter Units Result Limit MDL Analyzed Qualifiers

Mercury mg/L ND 0.00050 0.00036 02/28/19 15:35

LABORATORY CONTROL SAMPLE: 104470

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury mg/L 0.0025 0.0025 101 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 104471 104472

MS MSD 2615445001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 0.0025 0.0025 0.0024 75-125 0 20 Mercury mg/L ND 0.0024 98 98

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

Thallium

Date: 03/06/2019 05:35 PM

QC Batch: 23515 Analysis Method: EPA 6020B
QC Batch Method: EPA 3005A Analysis Description: 6020B MET

Associated Lab Samples: 2615445001, 2615445002, 2615445003

METHOD BLANK: 105353 Matrix: Water

Associated Lab Samples: 2615445001, 2615445002, 2615445003

		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Antimony	mg/L	ND	0.0030	0.00078	03/04/19 19:49	
Arsenic	mg/L	ND	0.0050	0.00057	03/04/19 19:49	
Barium	mg/L	ND	0.010	0.00078	03/04/19 19:49	
Beryllium	mg/L	ND	0.0030	0.000050	03/04/19 19:49	
Cadmium	mg/L	ND	0.0010	0.000093	03/04/19 19:49	
Chromium	mg/L	ND	0.010	0.0016	03/04/19 19:49	
Cobalt	mg/L	ND	0.010	0.00052	03/04/19 19:49	
Lead	mg/L	ND	0.0050	0.00027	03/04/19 19:49	
Lithium	mg/L	ND	0.050	0.00097	03/04/19 19:49	
Molybdenum	mg/L	ND	0.010	0.0019	03/04/19 19:49	
Selenium	mg/L	ND	0.010	0.0014	03/04/19 19:49	
Thallium	mg/L	ND	0.0010	0.00014	03/04/19 19:49	

LABORATORY CONTROL SAMPLE:	105354					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	mg/L	0.1	0.11	105	80-120	
Arsenic	mg/L	0.1	0.10	100	80-120	
Barium	mg/L	0.1	0.10	101	80-120	
Beryllium	mg/L	0.1	0.10	101	80-120	
Cadmium	mg/L	0.1	0.10	101	80-120	
Chromium	mg/L	0.1	0.10	105	80-120	
Cobalt	mg/L	0.1	0.10	102	80-120	
Lead	mg/L	0.1	0.10	100	80-120	
Lithium	mg/L	0.1	0.10	102	80-120	
Molybdenum	mg/L	0.1	0.10	103	80-120	
Selenium	mg/L	0.1	0.10	101	80-120	

0.1

mg/L

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	CATE: 10539	2		105393							
Parameter	Units	2615445001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/L	ND	0.1	0.1	0.11	0.10	105	103	75-125	2	20	
Arsenic	mg/L	ND	0.1	0.1	0.10	0.097	100	97	75-125	3	20	
Barium	mg/L	0.16	0.1	0.1	0.27	0.27	116	111	75-125	2	20	
Beryllium	mg/L	ND	0.1	0.1	0.098	0.095	98	95	75-125	4	20	
Cadmium	mg/L	ND	0.1	0.1	0.10	0.10	101	102	75-125	0	20	

0.10

101

80-120

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

Date: 03/06/2019 05:35 PM

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	ATE: 10539	2 MS	MSD	105393							
Parameter	Units	2615445001 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium	mg/L		0.1	0.1	0.10	0.099	102	99	75-125	3	20	
Cobalt	mg/L	ND	0.1	0.1	0.10	0.097	100	96	75-125	3	20	
Lead	mg/L	ND	0.1	0.1	0.099	0.097	99	97	75-125	2	20	
Lithium	mg/L	ND	0.1	0.1	0.097	0.095	97	95	75-125	2	20	
Molybdenum	mg/L	ND	0.1	0.1	0.10	0.10	102	100	75-125	2	20	
Selenium	mg/L	ND	0.1	0.1	0.098	0.098	98	98	75-125	0	20	
Thallium	mg/L	ND	0.1	0.1	0.10	0.097	100	97	75-125	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

Date: 03/06/2019 05:35 PM

QC Batch: 23493 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 2615445001, 2615445002, 2615445003

METHOD BLANK: 105280 Matrix: Water

Associated Lab Samples: 2615445001, 2615445002, 2615445003

Blank Reporting
Parameter Units Result Limit MDL Analyzed Qualifiers

Fluoride mg/L ND 0.30 0.029 03/04/19 12:13

LABORATORY CONTROL SAMPLE: 105281

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Fluoride mg/L 10 9.4 94 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 105285 105286

MS MSD 2615445001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Fluoride ND 8 mg/L 10 10 9.6 10.4 96 104 90-110 15

MATRIX SPIKE SAMPLE: 105358

MS 2615445002 Spike MS % Rec % Rec Parameter Units Result Conc. Result Limits Qualifiers ND 8.8 90-110 M1 Fluoride mg/L 10 88

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

# **ANALYTE QUALIFIERS**

Date: 03/06/2019 05:35 PM

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615445

Date: 03/06/2019 05:35 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2615445001	BGWA-2	EPA 3005A	23515	EPA 6020B	23543
2615445002	BGWC-8	EPA 3005A	23515	EPA 6020B	23543
2615445003	BGWC-16	EPA 3005A	23515	EPA 6020B	23543
2615445001	BGWA-2	EPA 7470A	23344	EPA 7470A	23360
2615445002	BGWC-8	EPA 7470A	23344	EPA 7470A	23360
2615445003	BGWC-16	EPA 7470A	23344	EPA 7470A	23360
2615445001	BGWA-2	EPA 300.0	23493		
2615445002	BGWC-8	EPA 300.0	23493		
2615445003	BGWC-16	EPA 300.0	23493		

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required	Client Information:	Section B Required Project Informat	roject	t Inform	vation:				3, <u>s</u>	Section C Invoice Information:	C	tion:											1 2		T.	2	
Company:	- Coal Combustion Residuals	Report To:	Joji	Joju Abraham	am				1	Attention					ı	ı	l		l	1	_	_	rage:	1	ı	5	
Address:		Copy To:	1	Geosyntec						Company Name	v Name				ı	ı											
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	co.com	Purchase Order #:	Jrder #		SCS10348606	909			1	Pace Quote:	ote:				ı				l					diatory	Adelley		
Phone:	06-7239 Fax	Project Nan	ne:	Plant	Plant Bowen Ash Pond	sh Pond			u.	Pace Project Manager.	oject Ma	anager.		betsy.mcdaniel@pacelabs.com,	ncdar	iel@	acela	bs.cc	m.				S	State / Location	ation		
Kednestec	Requested Due Date:	Project #:							LL.	ace Pro	:# elijc	315	П								L			GA			_
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# MƏTI	One Character per box. Wee (A-Z, 0-91, -) Sample Ids must be unique Tassee	AR AR ST	MATRIX CODE		DATE	m m	DATE	TIME	SAMPLE TEMP A	# OF CONTAINER	HVO3	нсі	HOBN Na2S203	Methanol	Other	sasylanA ebhoul		Netals 6020 App Sadium 226, 226						Residual Chlorin			
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	WO#: 2615445				S	SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: SIGNATURE of SAMPLER:	NAME AI	PRINT Name of SAMPLER: SIGNATURE of SAMPLER:	ATURE ER:	3235	3 3	7	12	13	3=	3	SATES	Ord Pro	14	52/	174		D in GMBT	Received on	(V/V) Custody	Sealed Cooler (V/V)	
					J	2	5		)																		

Sal	mple Condition	Upon Recei	WO#	: 2615445
Pace Analytical Client Name	: GA Paw	1er_	PM: BM CLIENT:	Due Date: 03/06/1
Courier: Fed Ex UPS USPS Clie Tracking #:		Pace Other		Proj. Due Date: Proj. Name:
Custody Seal on Cooler/Box Present:  yes		intact:  yes	∐ no	
Packing Material: Bubble Wrap Bubble		Other		
Cooler Temperature  Temp should be above freezing to 6°C	Type of Ice: @el	Blue None is Frozen: Yes No Comments:	Date	and Initials of person examining ntents:
Chain of Custody Present:	BYes DNo DN/A			
Chain of Custody Filled Out:	Dyes Ono On/A			
Chain of Custody Relinquished:	EYes ONO ON/A			
Sampler Name & Signature on COC:	EVes DNo DN/A			
Samples Arrived within Hold Time:	tres □No □N/A			
Short Hold Time Analysis (<72hr):	Elyes BNO ON/A			
Rush Turn Around Time Requested:	□Yes □No □N/A			
Sufficient Volume:	EYes □No □N/A	8.		
Correct Containers Used:	☐Yes ☐No ☐N/A	9.		
-Pace Containers Used:	ØYes □No □N/A			
Containers Intact:	Yes □No □N/A	10.		
Filtered volume received for Dissolved tests	□Yes □No □N/A	11.		
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix:	PYes, □No □N/A	12.		
All containers needing preservation have been checked.	₽Yes □No □N/A	13.		
All containers needing preservation are found to be in compliance with EPA recommendation.	ØYes □No □N/A		T	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	□Yes ☑No	Initial when completed	Lot # of preserv	The state of the s
Samples checked for dechlorination:	□Yes □No □NA	14.		
Headspace in VOA Vials ( >6mm):	□Yes □No □N/A	15.		
Trip Blank Present:	□Yes □No ☑N/A	16.		
Trip Blank Custody Seals Present	□Yes □No □N/A			
Pace Trip Blank Lot # (if purchased):	_			
Client Notification/ Resolution:			Field D	ata Required? Y / N
Person Contacted:	Date/	Time:		
Comments/ Resolution:				
			8151A WS	<u> </u>

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Project Manager Review:

Date:





March 22, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2615446

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on February 27, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta



(770)734-4200



## **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615446

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

**Arkansas Certification** 

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040

Guam Certification Hawaii Certification Idaho Certification Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Missouri Certification #: 235

Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615446

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
2615446001	BGWA-2	Water	02/25/19 11:03	02/27/19 15:43	
2615446002	BGWC-8	Water	02/25/19 13:12	02/27/19 15:43	
2615446003	BGWC-16	Water	02/25/19 15:50	02/27/19 15:43	



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615446

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2615446001	BGWA-2	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615446002	BGWC-8	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615446003	BGWC-16	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615446

Sample: BGWA-2 Lab ID: 2615446001 Collected: 02/25/19 11:03 Received: 02/27/19 15:43 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315 1.10 ± 0.426 (0.485) Radium-226 pCi/L 03/12/19 09:13 13982-63-3 C:91% T:NA EPA 9320 0.327 ± 0.381 (0.802) Radium-228 pCi/L 03/18/19 16:07 15262-20-1 C:77% T:79% Total Radium Total Radium  $1.43 \pm 0.807$  (1.29) pCi/L 03/19/19 14:43 7440-14-4 Calculation



## **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615446

Sample: BGWC-8 Lab ID: 2615446002 Collected: 02/25/19 13:12 Received: 02/27/19 15:43 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315  $0.313 \pm 0.236 \quad (0.383)$ Radium-226 pCi/L 03/12/19 09:13 13982-63-3 C:94% T:NA EPA 9320 0.712 ± 0.405 (0.733) Radium-228 pCi/L 03/18/19 16:07 15262-20-1 C:72% T:87% Total Radium Total Radium 1.03 ± 0.641 (1.12) pCi/L 03/19/19 14:43 7440-14-4 Calculation



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615446

Sample: BGWC-16 PWS:	<b>Lab ID: 26154460</b> Site ID:	O3 Collected: 02/25/19 15:50 Sample Type:	Received:	02/27/19 15:43	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.606 ± 0.298 (0.357) C:97% T:NA	pCi/L	03/12/19 09:13	3 13982-63-3	
Radium-228		0.473 ± 0.340 (0.652) C:76% T:85%	pCi/L	03/18/19 16:07	7 15262-20-1	
Total Radium	Total Radium Calculation	1.08 ± 0.638 (1.01)	pCi/L	03/19/19 14:43	3 7440-14-4	



## **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615446

QC Batch: 332854 Analysis Method: EPA 9320
QC Batch Method: EPA 9320 Analysis Description: 9320 Radium 228

Associated Lab Samples: 2615446001, 2615446002, 2615446003

METHOD BLANK: 1619642 Matrix: Water

Associated Lab Samples: 2615446001, 2615446002, 2615446003

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.381 ± 0.318 (0.630) C:77% T:89%
 pCi/L
 03/18/19 16:07

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615446

QC Batch: 332626 Analysis Method: EPA 9315

QC Batch Method: EPA 9315 Analysis Description: 9315 Total Radium

Associated Lab Samples: 2615446001, 2615446002, 2615446003

METHOD BLANK: 1618580 Matrix: Water

Associated Lab Samples: 2615446001, 2615446002, 2615446003

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-226 0.397 ± 0.246 (0.344) C:98% T:NA pCi/L 03/12/19 09:13

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615446

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **LABORATORIES**

Date: 03/22/2019 08:58 AM

PASI-PA Pace Analytical Services - Greensburg



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615446

Date: 03/22/2019 08:58 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2615446001	BGWA-2	EPA 9315	332626		
2615446002	BGWC-8	EPA 9315	332626		
2615446003	BGWC-16	EPA 9315	332626		
2615446001	BGWA-2	EPA 9320	332854		
2615446002	BGWC-8	EPA 9320	332854		
2615446003	BGWC-16	EPA 9320	332854		
2615446001	BGWA-2	Total Radium Calculation	334412		
2615446002	BGWC-8	Total Radium Calculation	334412		
2615446003	BGWC-16	Total Radium Calculation	334412		

Pace Analytical

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT, All relevant fields must be completed accurately.

Section A		Section B							Section C	v										L	١	ı		
Company	Company Court Information:	Required Project Information:	Project I	nformatic	:uc				Invoice	Invoice Information:	tion:										Page:	-		ъ
Address	2480 Manar Donal	Report 10.	- 1	Joju Abraham					Attention:											ı				
	Atlanta GA 30339	copy 10.	- 1	yntec					Compan	Company Name	24									1	1		1	
	jabraham@southemco.com	Purchase Order #	Order #:	SCS	SCS 10348606	0.00		T	Pace Oriote	oto.				ŀ				T			Reg	Regulatory Agency	gency	
Phone	(404)506-7239 Fax	Project Name:	1	Plant Bowen Ash Pond	en Ash F	puoc		T	Pace Pro	Pace Project Manager	nager	bet	SV MCC	/leiue	ภิกลกค	betsv mcdaniel@nacelahs com	8	T			ð	Ctate I I cention	Minn	
Requested Due Date:	ue Date:	Project #:	П						Pace Profile #	# elife	315							T		ı		GA A		
			-	-					П	$\  \ $		П		Ц		Sednes	ed Ana	Requested Analysis Filtered (Y/N)	ered (Y/	N)	F			
	MATRIX		_	(dWO)-	ŏ	COLLECTED		NO		ď	Preservatives	atives		N/A										
	SAMPLE ID Self-seld			D 8ARD=0)	START		END		SH					Test		-					0000	(2001) 20		
# MƏTI	One Character per box. Wee Wee (A-2, 0.9 / ) Art Cher Sample Ids must be unique Trasse		MATRIX CODE	SAMPLE TYPE DATE	TIME	E DATE	E TIME	AMBT BJ9MA2	# OF CONTAINE	HZSO4	нсі	Na2S203	Methanol	Analyses	-ppuoni-	Metals 6020 App Radium 226, 22					isold O levision	Residual Chloni		
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4										-	$\perp$	1	+		-				+		T			1
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	ADDITIONAL COMMENTS	EC.	RELINGUE	RELINQUISHED BY / AFFILIATION	AFFILIAT	NOI	DATE		TIME			ACCEP	ACCEPTED BY / AFFLIATION	/AFFIL	MTION	-		DATE	-	TIME		SAMP	SAMPLE CONDITIONS	OITIONS
		3	more		March	7	2/3	1	.34	M	3	Jessier	13/	bligh	8		7	27	16	1543	3,5	>		2
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=	0# · 2615/16				SAMPL	ER NAME	SAMPLER NAME AND SIGNATURE	NATURE														u	+	Τ
Page 12	04+CT07:#0				P. SK	SNATURE	PRINT Name of SAMPLER: SIGNATURE of SAMPLER:	LER:	13/	专为	EK	= 2	1	3	OATE	Crafter DATE Signed:	21.7	125/	1/4		D ni 9MBT	Received o	(V/V) Custody	Sealed Cooler (Y/N)
	2615446				Ċ.	( indy	March	2	2					1									4	

### WO# 26154 Sample Condition Upon Recei PM: BM Due Date: 03/27/19 Pace Analytical Client Name: (-CLIENT: GAPower-CCR Courier: Fed Ex UPS USPS Client Commercial Pace Other Optional Proj. Due Date: Tracking #: Proj. Name: Custody Seal on Cooler/Box Present: ves Seals intact: Packing Material: Bubble Wrap Bubble Bags None Other Thermometer Used Type of Ice: Wel Blue None Samples on ice, cooling process has begun Date and Initials of person examining Biological Tissue is Frozen: Yes No Cooler Temperature contents: 0 Temp should be above freezing to 6°C Comments: Chain of Custody Present: BYes □No □N/A 1 Chain of Custody Filled Out: DYES DNO □N/A 2 EYes DNo Chain of Custody Relinquished: □N/A 3. Sampler Name & Signature on COC: Pres DNo DN/A 4 Samples Arrived within Hold Time: DYes DNo □N/A 5 Short Hold Time Analysis (<72hr): El Yes ENO □N/A 6. Rush Turn Around Time Requested: □Yes □No □N/A 7 EYes DNo Sufficient Volume: □N/A 8 Correct Containers Used: □Yes □No □N/A 9 -Pace Containers Used: ØYes □No □N/A ØYes □No □N/A 10. Containers Intact: Filtered volume received for Dissolved tests □Yes □No BN/A 11 Sample Labels match COC: Tyes, No DN/A 12. -Includes date/time/ID/Analysis All containers needing preservation have been checked. PYes ONO ON/A 13. All containers needing preservation are found to be in QYes □No □N/A compliance with EPA recommendation. Initial when Lot # of added □Yes ☑No exceptions: VOA, coliform, TOC, O&G, WI-DRO (water) completed preservative Samples checked for dechlorination: DYes DNo DNA Headspace in VOA Vials ( >6mm): ☐Yes ☐No □N/A 15 Trip Blank Present: □Yes □No DN/A Trip Blank Custody Seals Present □Yes □No ☑N/A Pace Trip Blank Lot # (if purchased): Client Notification/ Resolution: Field Data Required? Y / Person Contacted: Date/Time: Comments/ Resolution: 8151A WSC

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Page 13 of 13 Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Project Manager Review:

Date:





March 07, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on February 28, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Maria Padilla, Georgia Power Rebecca Thornton, Pace Analytical Atlanta







# **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

**Atlanta Certification IDs** 

110 Technology Parkway Peachtree Corners, GA 30092

Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001

Virginia Certification #: 460204



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
2615499001	BGWA-29	Water	02/27/19 11:16	02/28/19 17:00	
2615499002	BGWC-17	Water	02/27/19 13:00	02/28/19 17:00	
2615499003	BGWC-18	Water	02/27/19 15:00	02/28/19 17:00	
2615499004	BGWC-20	Water	02/27/19 16:46	02/28/19 17:00	
2615499005	Dup-1	Water	02/27/19 00:00	02/28/19 17:00	



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2615499001	BGWA-29	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615499002	BGWC-17	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615499003	BGWC-18	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615499004	BGWC-20	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615499005	Dup-1	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1



Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

Date: 03/07/2019 03:19 PM

Sample: BGWA-29	Lab ID:	2615499001	Collecte	ed: 02/27/19	11:16	Received: 02/	28/19 17:00 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/05/19 11:25	03/06/19 13:06	7440-36-0	
Arsenic	0.0011J	mg/L	0.0050	0.00057	1	03/05/19 11:25	03/06/19 13:06	7440-38-2	
Barium	0.013	mg/L	0.010	0.00078	1	03/05/19 11:25	03/06/19 13:06	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/05/19 11:25	03/06/19 13:06	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/05/19 11:25	03/06/19 13:06	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/05/19 11:25	03/06/19 13:06	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/05/19 11:25	03/06/19 13:06	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/05/19 11:25	03/06/19 13:06	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/05/19 11:25	03/06/19 13:06	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/05/19 11:25	03/06/19 13:06	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/05/19 11:25	03/06/19 13:06	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/05/19 11:25	03/06/19 13:06	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	0.000065J	mg/L	0.00050	0.000036	1	03/04/19 10:46	03/05/19 12:45	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	ND	mg/L	0.30	0.029	1		03/04/19 22:12	16984-48-8	M1



Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

Date: 03/07/2019 03:19 PM

Sample: BGWC-17	Lab ID:	2615499002	Collecte	ed: 02/27/19	13:00	Received: 02/	28/19 17:00 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL .	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/05/19 11:25	03/06/19 13:11	7440-36-0	
Arsenic	0.0010J	mg/L	0.0050	0.00057	1	03/05/19 11:25	03/06/19 13:11	7440-38-2	
Barium	0.014	mg/L	0.010	0.00078	1	03/05/19 11:25	03/06/19 13:11	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/05/19 11:25	03/06/19 13:11	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/05/19 11:25	03/06/19 13:11	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/05/19 11:25	03/06/19 13:11	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/05/19 11:25	03/06/19 13:11	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/05/19 11:25	03/06/19 13:11	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/05/19 11:25	03/06/19 13:11	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/05/19 11:25	03/06/19 13:11	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/05/19 11:25	03/06/19 13:11	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/05/19 11:25	03/06/19 13:11	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	0.00029J	mg/L	0.00050	0.000036	1	03/04/19 10:46	03/05/19 12:47	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	0.26J	mg/L	0.30	0.029	1		03/04/19 23:14	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

Date: 03/07/2019 03:19 PM

Sample: BGWC-18	Lab ID:	2615499003	Collecte	ed: 02/27/19	15:00	Received: 02/	28/19 17:00 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/05/19 11:25	03/06/19 13:17	7440-36-0	
Arsenic	0.00083J	mg/L	0.0050	0.00057	1	03/05/19 11:25	03/06/19 13:17	7440-38-2	
Barium	0.027	mg/L	0.010	0.00078	1	03/05/19 11:25	03/06/19 13:17	7440-39-3	
Beryllium	0.00011J	mg/L	0.0030	0.000050	1	03/05/19 11:25	03/06/19 13:17	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/05/19 11:25	03/06/19 13:17	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/05/19 11:25	03/06/19 13:17	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/05/19 11:25	03/06/19 13:17	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/05/19 11:25	03/06/19 13:17	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/05/19 11:25	03/06/19 13:17	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/05/19 11:25	03/06/19 13:17	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/05/19 11:25	03/06/19 13:17	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/05/19 11:25	03/06/19 13:17	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	0.000079J	mg/L	0.00050	0.000036	1	03/04/19 10:46	03/05/19 12:50	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	ND	mg/L	0.30	0.029	1		03/04/19 23:55	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

Date: 03/07/2019 03:19 PM

Sample: BGWC-20	Lab ID:	2615499004	Collecte	ed: 02/27/19	16:46	Received: 02/	28/19 17:00 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/05/19 11:25	03/06/19 13:23	7440-36-0	
Arsenic	0.0014J	mg/L	0.0050	0.00057	1	03/05/19 11:25	03/06/19 13:23	7440-38-2	
Barium	0.032	mg/L	0.010	0.00078	1	03/05/19 11:25	03/06/19 13:23	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/05/19 11:25	03/06/19 13:23	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/05/19 11:25	03/06/19 13:23	7440-43-9	
Chromium	0.0048J	mg/L	0.010	0.0016	1	03/05/19 11:25	03/06/19 13:23	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/05/19 11:25	03/06/19 13:23	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/05/19 11:25	03/06/19 13:23	7439-92-1	
Lithium	0.015J	mg/L	0.050	0.00097	1	03/05/19 11:25	03/06/19 13:23	7439-93-2	
Molybdenum	0.013	mg/L	0.010	0.0019	1	03/05/19 11:25	03/06/19 13:23	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/05/19 11:25	03/06/19 13:23	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/05/19 11:25	03/06/19 13:23	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	0.000066J	mg/L	0.00050	0.000036	1	03/04/19 10:46	03/05/19 12:52	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	0.13J	mg/L	0.30	0.029	1		03/05/19 00:16	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

Date: 03/07/2019 03:19 PM

Sample: Dup-1	Lab ID:	2615499005	Collecte	ed: 02/27/19	00:00	Received: 02/	28/19 17:00 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/05/19 11:25	03/06/19 13:28	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00057	1	03/05/19 11:25	03/06/19 13:28	7440-38-2	
Barium	0.013	mg/L	0.010	0.00078	1	03/05/19 11:25	03/06/19 13:28	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/05/19 11:25	03/06/19 13:28	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/05/19 11:25	03/06/19 13:28	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/05/19 11:25	03/06/19 13:28	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/05/19 11:25	03/06/19 13:28	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/05/19 11:25	03/06/19 13:28	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/05/19 11:25	03/06/19 13:28	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/05/19 11:25	03/06/19 13:28	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/05/19 11:25	03/06/19 13:28	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/05/19 11:25	03/06/19 13:28	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	0.000054J	mg/L	0.00050	0.000036	1	03/04/19 10:46	03/05/19 12:59	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	ND	mg/L	0.30	0.029	1		03/05/19 00:36	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

METHOD BLANK: 105333

Date: 03/07/2019 03:19 PM

 QC Batch:
 23510
 Analysis Method:
 EPA 7470A

 QC Batch Method:
 EPA 7470A
 Analysis Description:
 7470 Mercury

 Associated Lab Samples:
 2615499001, 2615499002, 2615499003, 2615499004, 2615499005

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Associated Lab Samples: 2615499001, 2615499002, 2615499003, 2615499004, 2615499005

Blank Reporting

Matrix: Water

Parameter Units Result Limit MDL Analyzed Qualifiers

Mercury mg/L 0.000058J 0.00050 0.000036 03/05/19 12:05

LABORATORY CONTROL SAMPLE: 105334

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury mg/L 0.0025 0.0027 108 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 105335 105336

MS MSD 2615468001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 0.0025 0.0025 75-125 2 20 Mercury mg/L 0.000074J 0.0025 0.0025 99 97

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

Selenium

Date: 03/07/2019 03:19 PM

Thallium

 QC Batch:
 23567
 Analysis Method:
 EPA 6020B

 QC Batch Method:
 EPA 3005A
 Analysis Description:
 6020B MET

 Associated Lab Samples:
 2615499001, 2615499002, 2615499003, 2615499004, 2615499005

METHOD BLANK: 105477 Matrix: Water

Associated Lab Samples: 2615499001, 2615499002, 2615499003, 2615499004, 2615499005

mg/L

mg/L

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
				IVIDE	Analyzed	Qualificis
Antimony	mg/L	ND	0.0030	0.00078	03/06/19 12:37	
Arsenic	mg/L	ND	0.0050	0.00057	03/06/19 12:37	
Barium	mg/L	ND	0.010	0.00078	03/06/19 12:37	
Beryllium	mg/L	ND	0.0030	0.000050	03/06/19 12:37	
Cadmium	mg/L	ND	0.0010	0.000093	03/06/19 12:37	
Chromium	mg/L	ND	0.010	0.0016	03/06/19 12:37	
Cobalt	mg/L	ND	0.010	0.00052	03/06/19 12:37	
Lead	mg/L	ND	0.0050	0.00027	03/06/19 12:37	
Lithium	mg/L	ND	0.050	0.00097	03/06/19 12:37	
Molybdenum	mg/L	ND	0.010	0.0019	03/06/19 12:37	
Selenium	mg/L	ND	0.010	0.0014	03/06/19 12:37	
Thallium	mg/L	ND	0.0010	0.00014	03/06/19 12:37	

LABORATORY CONTROL SAMPLE:	105478					
Demonstra	11.26	Spike	LCS	LCS	% Rec	0
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	mg/L	0.1	0.10	100	80-120	
Arsenic	mg/L	0.1	0.097	97	80-120	
Barium	mg/L	0.1	0.098	98	80-120	
Beryllium	mg/L	0.1	0.098	98	80-120	
Cadmium	mg/L	0.1	0.10	100	80-120	
Chromium	mg/L	0.1	0.10	103	80-120	
Cobalt	mg/L	0.1	0.10	102	80-120	
Lead	mg/L	0.1	0.10	100	80-120	
Lithium	mg/L	0.1	0.099	99	80-120	
Molybdenum	mg/L	0.1	0.10	101	80-120	

0.1

0.1

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	CATE: 10547	9		105480							
Parameter	Units	2615503001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/L	ND	0.1	0.1	0.10	0.11	104	107	75-125	3	20	
Arsenic	mg/L	ND	0.1	0.1	0.10	0.098	100	98	75-125	2	20	
Barium	mg/L	0.0067J	0.1	0.1	0.11	0.11	104	104	75-125	0	20	
Beryllium	mg/L	0.00016J	0.1	0.1	0.096	0.098	96	98	75-125	2	20	
Cadmium	mg/L	ND	0.1	0.1	0.10	0.10	103	100	75-125	2	20	

0.10

0.10

101

100

80-120

80-120

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

Date: 03/07/2019 03:19 PM

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	CATE: 10547	9		105480							
Parameter	Units	2615503001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium	mg/L	ND	0.1	0.1	0.10	0.10	104	103	75-125	1	20	
Cobalt	mg/L	ND	0.1	0.1	0.10	0.10	103	100	75-125	3	20	
Lead	mg/L	ND	0.1	0.1	0.10	0.10	102	101	75-125	1	20	
Lithium	mg/L	ND	0.1	0.1	0.099	0.097	99	97	75-125	2	20	
Molybdenum	mg/L	ND	0.1	0.1	0.10	0.10	105	105	75-125	0	20	
Selenium	mg/L	ND	0.1	0.1	0.11	0.10	104	100	75-125	4	20	
Thallium	mg/L	ND	0.1	0.1	0.10	0.10	101	101	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

QC Batch: 23494 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 2615499001, 2615499002, 2615499003, 2615499004, 2615499005

METHOD BLANK: 105287 Matrix: Water

Associated Lab Samples: 2615499001, 2615499002, 2615499003, 2615499004, 2615499005

Blank Reporting

 Parameter
 Units
 Result
 Limit
 MDL
 Analyzed
 Qualifiers

 Fluoride
 mg/L
 ND
 0.30
 0.029
 03/04/19 21:30

LABORATORY CONTROL SAMPLE: 105288

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Fluoride mg/L 10 9.5 95 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 105374 105375

MS MSD 2615499001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Fluoride ND 85 15 M1 mg/L 10 10 8.5 8.9 90-110 5 89

MATRIX SPIKE SAMPLE: 105376

Date: 03/07/2019 03:19 PM

MS 2615499002 Spike MS % Rec % Rec Parameter Units Result Conc. Result Limits Qualifiers 0.26J Fluoride mg/L 10 9.9 96 90-110

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

# **ANALYTE QUALIFIERS**

Date: 03/07/2019 03:19 PM

B Analyte was detected in the associated method blank.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.



### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615499

Date: 03/07/2019 03:19 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2615499001	BGWA-29	EPA 3005A	23567	EPA 6020B	23647
2615499002	BGWC-17	EPA 3005A	23567	EPA 6020B	23647
2615499003	BGWC-18	EPA 3005A	23567	EPA 6020B	23647
2615499004	BGWC-20	EPA 3005A	23567	EPA 6020B	23647
2615499005	Dup-1	EPA 3005A	23567	EPA 6020B	23647
2615499001	BGWA-29	EPA 7470A	23510	EPA 7470A	23534
2615499002	BGWC-17	EPA 7470A	23510	EPA 7470A	23534
2615499003	BGWC-18	EPA 7470A	23510	EPA 7470A	23534
2615499004	BGWC-20	EPA 7470A	23510	EPA 7470A	23534
2615499005	Dup-1	EPA 7470A	23510	EPA 7470A	23534
2615499001	BGWA-29	EPA 300.0	23494		
2615499002	BGWC-17	EPA 300.0	23494		
2615499003	BGWC-18	EPA 300.0	23494		
2615499004	BGWC-20	EPA 300.0	23494		
2615499005	Dup-1	EPA 300.0	23494		

Pace Analytical

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required	Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	pane. 1 Of (
Company	Georgia Power - Coal Combustion Residuals	Report To. Joju Abraham	Attention:	
Address:	2480 Maner Road	Copy To. Geosyntec	Company Name:	
	Atlanta, GA 30339		Address:	Regulatory Agency
The state of	:0.com	# 10	Pace Quote	
Regions	Rechester Dus Date:	Project Name Plant Bowen Ash Pond	an	State
are postor	a Dae Dale	Project #	Pace Profile #: 315	GA
		(AM)	N/.	Requested Analysis Filtered (Y/N)
	MATRIX	CODE CODE	Preservatives	
	SAMPLE ID Saussid	S P WW W W W W W W W W W W W W W W W W W	 	
# M∃TI	One Character per box. Wee (A-Z, 0-91, -) Other Sample Ids must be unique Tessue	A S & S & D & S & S & S & S & S & S & S &	Metals 6020/747  Mether Machen	825, 326, 228
-	136WA-29	1116	<del>-</del> - <del>-</del> <del>-</del> - <del>-</del> <del>-</del> - <del>-</del> <del>-</del> - <del>-</del> <del>-</del> - <del>-</del> - <del>-</del> - <del>-</del>	, 2
2	13600-17	WIG 427/9 1300		7
6	13605-18	M 6 44/ 1500	N	2
4	B6WL-20	WTG 427/91646	41.3	7
2	Dup-1	MTG 745/19	- ! - ! - !	2
9				
7				
60				
6				
10				
11				
12				
	ADDITIONAL GOMMENTS	RELINGUISHED BY LAFFILLATION DATE	THE ACCEPTED BY LAFFILLATION	GATE TIME SAMPLE CONDITIONS
		("indy Marcho 2/28	1:23 Change from	2 28/19 120 11.1 × W X
		)		-
⊬age	WO#: 2615499	SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: 7	5/11/08/11/2	33.
16 of			Not the DATE Signed:	gened: $\frac{(Y_1)}{(Y_2)}$
17		Z		

## Pace Analytical

### Sample Condition Upon Receipt

W0#:2615499

Client Name: Georgia lower

M: BM Due Date: 03/07/19

CLIENT: GAPower-CCR

Courier:  Fed Ex UPS USPS Clier	nt Commercial	Pace Other	Proj. Due Date:
Tracking #:Custody Seal on Cooler/Box Present: yes	no Seals	intact:  yes  r	Proj. Name:
	00.00		
Packing Material: Bubble Wrap Bubble	6	Other	
Thermometer Used 084	Type of Ice:	Г	Samples on ice, cooling process has begun  Date and Initials of person examining
Cooler Temperature	Biological Tissue	is Frozen: Yes No	contents: 28/19/04
Temp should be above freezing to 6°C		Comments:	
Chain of Custody Present:	☐Yes ☐No ☐N/A	1.	
Chain of Custody Filled Out:	Yes No N/A	2.	
Chain of Custody Relinquished:	□Yes □No □N/A	3.	
Sampler Name & Signature on COC:	ØYes □No □N/A	4.	
Samples Arrived within Hold Time:	PYes □No □N/A	5.	
Short Hold Time Analysis (<72hr):	□Yes □No □N/A	6.	
Rush Turn Around Time Requested:	□Yes □No □N/A	7.	
Sufficient Volume:	EYes □No □N/A	8.	
Correct Containers Used:	☐Yes ☐No ☐N/A	9.	
-Pace Containers Used:	Ves □No □N/A		
Containers Intact:	Øyes □No □N/A	10.	
Filtered volume received for Dissolved tests	□Yes □No ☑N/A	11.	
Sample Labels match COC:	☐Yes ☐No ☐N/A	12.	
-Includes date/time/ID/Analysis Matrix:	W		
All containers needing preservation have been checked.	☐Yes □No □N/A	13.	
All containers needing preservation are found to be in			
compliance with EPA recommendation.	Des Ono On/A		
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	⊠Yes □No	Initial when completed	Lot # of added preservative
Samples checked for dechlorination:	□Yes □No □MYĀ	14.	
Headspace in VOA Vials ( >6mm):	□Yes □No ☑N/A	15.	
Trip Blank Present:	□Yes □No □N/A	16.	
Trip Blank Custody Seals Present	□Yes □No □N/A		
Pace Trip Blank Lot # (if purchased):			
Client Notification/ Resolution:			Field Data Required? Y / N
Person Contacted:	Date	/Time:	
Comments/ Resolution:			
		815	1A WSC
Project Manager Review:			Date:
			Duto.





March 22, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

### Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on February 28, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta



(770)734-4200



### **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

**Arkansas Certification** 

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040

Guam Certification
Hawaii Certification

Idaho Certification
Illinois Certification

Indiana Certification lowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133

KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Missouri Certification #: 235

Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706

North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526

West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L

Washington Certification #: C868



### **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
2615500001	BGWA-29	Water	02/27/19 11:16	02/28/19 17:00	
2615500002	BGWC-17	Water	02/27/19 13:00	02/28/19 17:00	
2615500003	BGWC-18	Water	02/27/19 15:00	02/28/19 17:00	
2615500004	BGWC-20	Water	02/27/19 16:46	02/28/19 17:00	
2615500005	Dup-1	Water	02/27/19 00:00	02/28/19 17:00	



### **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2615500001	BGWA-29	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615500002	BGWC-17	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615500003	BGWC-18	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615500004	BGWC-20	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615500005	Dup-1	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

Sample: BGWA-29 PWS:	<b>Lab ID: 26155000</b> Site ID:	O1 Collected: 02/27/19 11:16 Sample Type:	Received:	02/28/19 17:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.343 ± 0.176 (0.290) C:94% T:NA	pCi/L	03/13/19 18:50	13982-63-3	
Radium-228		0.598 ± 0.412 (0.787) C:74% T:79%	pCi/L	03/18/19 16:07	7 15262-20-1	
Total Radium	Total Radium Calculation	0.941 ± 0.588 (1.08)	pCi/L	03/19/19 14:44	1 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

Sample: BGWC-17 PWS:	<b>Lab ID: 26155000</b> Site ID:	O2 Collected: 02/27/19 13:00 Sample Type:	Received:	02/28/19 17:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.430 ± 0.149 (0.177) C:87% T:NA	pCi/L	03/13/19 18:50	13982-63-3	
Radium-228		1.14 ± 0.513 (0.847) C:74% T:75%	pCi/L	03/18/19 16:07	7 15262-20-1	
Total Radium	Total Radium Calculation	1.57 ± 0.662 (1.02)	pCi/L	03/19/19 14:44	4 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

Sample: BGWC-18 PWS:	<b>Lab ID</b> : <b>26155000</b> Site ID:	O3 Collected: 02/27/19 15:00 Sample Type:	Received:	02/28/19 17:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.519 ± 0.174 (0.227) C:93% T:NA	pCi/L	03/13/19 18:50	13982-63-3	
Radium-228		0.605 ± 0.428 (0.823) C:70% T:80%	pCi/L	03/18/19 16:08	3 15262-20-1	
Total Radium	Total Radium Calculation	1.12 ± 0.602 (1.05)	pCi/L	03/21/19 13:16	6 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

Sample: BGWC-20 PWS:	<b>Lab ID: 26155000</b> Site ID:	O4 Collected: 02/27/19 16:46 Sample Type:	Received:	02/28/19 17:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.986 ± 0.237 (0.232) C:97% T:NA	pCi/L	03/13/19 18:50	13982-63-3	
Radium-228		0.258 ± 0.338 (0.716) C:72% T:78%	pCi/L	03/18/19 16:08	3 15262-20-1	
Total Radium	Total Radium Calculation	1.24 ± 0.575 (0.948)	pCi/L	03/21/19 13:16	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

Sample: Dup-1 PWS:	<b>Lab ID: 26155000</b> Site ID:	05 Collected: 02/27/19 00:00 Sample Type:	Received:	02/28/19 17:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.401 ± 0.135 (0.156) C:93% T:NA	pCi/L	03/13/19 18:50	13982-63-3	
Radium-228		0.588 ± 0.352 (0.632) C:76% T:83%	pCi/L	03/18/19 16:07	7 15262-20-1	
Total Radium	Total Radium Calculation	$0.989 \pm 0.487  (0.788)$	pCi/L	03/19/19 14:44	4 7440-14-4	



### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

QC Batch: 332854 Analysis Method: EPA 9320
QC Batch Method: EPA 9320 Analysis Description: 9320 Radium 228

Associated Lab Samples: 2615500001, 2615500002, 2615500003, 2615500004, 2615500005

METHOD BLANK: 1619642 Matrix: Water

Associated Lab Samples: 2615500001, 2615500002, 2615500003, 2615500004, 2615500005

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.381 ± 0.318 (0.630) C:77% T:89%
 pCi/L
 03/18/19 16:07

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

QC Batch: 332856 Analysis Method: EPA 9315

QC Batch Method: EPA 9315 Analysis Description: 9315 Total Radium

Associated Lab Samples: 2615500001, 2615500002, 2615500003, 2615500004, 2615500005

METHOD BLANK: 1619644 Matrix: Water

Associated Lab Samples: 2615500001, 2615500002, 2615500003, 2615500004, 2615500005

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-226 0.265 ± 0.116 (0.162) C:92% T:NA pCi/L 03/13/19 20:28

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **LABORATORIES**

Date: 03/22/2019 09:18 AM

PASI-PA Pace Analytical Services - Greensburg



### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615500

Date: 03/22/2019 09:18 AM

ab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytica Batch
2615500001	BGWA-29	EPA 9315	332856	_	
615500002	BGWC-17	EPA 9315	332856		
615500003	BGWC-18	EPA 9315	332856		
615500004	BGWC-20	EPA 9315	332856		
2615500005	Dup-1	EPA 9315	332856		
2615500001	BGWA-29	EPA 9320	332854		
615500002	BGWC-17	EPA 9320	332854		
615500003	BGWC-18	EPA 9320	332854		
615500004	BGWC-20	EPA 9320	332854		
615500005	Dup-1	EPA 9320	332854		
2615500001	BGWA-29	Total Radium Calculation	334415		
615500002	BGWC-17	Total Radium Calculation	334415		
2615500003	BGWC-18	Total Radium Calculation	334844		
2615500004	BGWC-20	Total Radium Calculation	334844		
2615500005	Dup-1	Total Radium Calculation	334415		

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Required	Clie	2	Information:			Invoice Ir	Invoice Information:	n:							rage:	-	5	
Company			Joju Abraham			Aitellion							T					
Address		Copy To Geo	Geosyntec			Company Name	Name								Boomla	Remitatory Agency	2	NOT SERVICE AND
	Atlanta, GA 30339	D. contraction Desired				Address.	No								vedula	HOLY AGE	1	
	abraham(@southernco.com	Project Name	Dlawt Breugn &ch Dong	-		Pace Pro	Pace Project Manager		hetey modaniel@nacelabs com	ed@lei	nelabs o	mo			State	State / Location		
Regulação	Received Due Date	Project #				Pace Profile #	file #						-			GA		
	5.5.5.0.5.0.5.0.5.0.5.0.5.0.5.0.5.0.5.0						П				Re	quested A	Requested Analysis Filtered (Y/N)	(N/A) pe	T			
	метви	5002	COFF	ECTED	N		Pre	Preservatives	S	N/A					22.			
	SAMPLE ID	Mater DW ster DW See valid code	C=CRAB C=C	END	יז כסררבכנוס	SP						8			(N/A) aui			
ITEM #	One Character per box. Wipe (A.Z. 0.91, -) Sample (ds must be unique	\$ 4 4 5 5	SAMPLE TYPE DATE	DATE	TIME A MMST SJAMAS	# OF CONTAINE	FOSSH	NRSSSO3 HCI	Methanol	səsylsnA	Metals 6020/74	Radium 226, 22			Residual Chlor			
-	13/21JA-79	M	-	1		-	M				_	2						_
2	13(201,-17	与	WIG 421/4 1300			- 7	Μ				_	2						ce (
63	72625-18	五	MG 42/4 1500	-		4 -	M				=	2						0
4	Bowr - 20	IM	WTG 747/191646			- 5	M				_	7						5
رم ر	Dup-1	5	MTG 40/19-			- - -	M				-	N						~
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							-											
Page 1	MO#:2615500	0	PR	PRINT Name of SAMPLER: 7	SAMPLER	72	1,10	M. I.	13	,	Steel	K			) UI a	o pani	b:	səjd
4 of 1			SIG	SIGNATURE of SAMPLER	SAMPLER	3	27	1	7		DATE	DATE Signed:	12/2	61/	TEMB	Rece (A\N)	Seale Seale (V/V)	(N/Y)
5					20	\	)											

San	ipie Condition	Opon Receip	HO1	. 2010
Face Analytical Client Name:	Georgia	1/		Due
Courier: Fed Ex UPS USPS Clier	t Commercial			Proj. Due Date:
Fracking #:	Cools	intent: Dung D	no	Proj. Name:
Custody Seal on Cooler/Box Present: yes	ATTEN DIMENT NAMED N	intact:  yes	110	
Packing Material: Bubble Wrap Bubble	5	Other		av 90 i contrologica di pagazione
Thermometer Used 082	Type of Ice: Web			on ice, cooling process has begun and Initials of person examining
Cooler Temperature  Temp should be above freezing to 6°C	Biological Tissue	is Frozen: Yes No Comments:		intents: 2 - 3/19(34)
Chain of Custody Present:	□Yes □No □N/A	1.		
Chain of Custody Filled Out:	Yes ONO ON/A	2.		
Chain of Custody Relinquished:	QYes □No □N/A	3.		
Sampler Name & Signature on COC:	□Yes □No □N/A	4.		
Samples Arrived within Hold Time:	BYes □No □N/A	5.		
Short Hold Time Analysis (<72hr):	□Yes □NO □N/A	6.		
Rush Turn Around Time Requested:	□Yes □No □N/A	7.		
Sufficient Volume:	Yes No N/A	8.		
Correct Containers Used:	☐Yes ☐No ☐N/A	9.		
-Pace Containers Used:	ØYes □No □N/A	Ś		
Containers Intact:	Yes DNo DN/A	10.		
Filtered volume received for Dissolved tests	□Yes □No ☑N/A	11.		
Sample Labels match COC:	☐Yes ☐No ☐N/A	12.		
-Includes date/time/ID/Analysis Matrix:	Øyes □No □N//	112		
All containers needing preservation are found to be in compliance with EPA recommendation.	Des Ono On/			
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☑Yes □No	Initial when completed	Lot # o	f added vative
Samples checked for dechlorination:	□Yes □No □M	14.		
Headspace in VOA Vials ( >6mm):	□Yes □No ☑N/	A 15.		
Trip Blank Present:	□Yes □No □N	A 16.		
Trip Blank Custody Seals Present	□Yes □No □Ni	Á		
Pace Trip Blank Lot # (if purchased):				
Client Notification/ Resolution:			Field (	Data Required? Y / N
Person Contacted:	Date	e/Time:		-
Comments/ Resolution:				
		81	51A W	SC SC

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Project Manager Review:

Date:





March 11, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

### Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on March 01, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta







### **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

**Atlanta Certification IDs** 

110 Technology Parkway Peachtree Corners, GA 30092

Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001

Virginia Certification #: 460204



### **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
2615551001	BGWC-10	Water	02/28/19 12:26	03/01/19 16:22	
2615551002	BGWC-7	Water	02/28/19 13:32	03/01/19 16:22	
2615551003	BGWC-12	Water	02/28/19 15:14	03/01/19 16:22	



### **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2615551001	BGWC-10	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	RLC	1
2615551002	BGWC-7	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	RLC	1
2615551003	BGWC-12	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	RLC	1



### **ANALYTICAL RESULTS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

Date: 03/11/2019 11:49 AM

Sample: BGWC-10	Lab ID:	2615551001	Collecte	ed: 02/28/19	12:26	Received: 03/	01/19 16:22 Ma	atrix: Water	•
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/06/19 19:53	7440-36-0	
Arsenic	0.0058	mg/L	0.0050	0.00057	1	03/06/19 11:40	03/06/19 19:53	7440-38-2	
Barium	0.053	mg/L	0.010	0.00078	1	03/06/19 11:40	03/06/19 19:53	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/06/19 11:40	03/07/19 13:55	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/06/19 19:53	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/06/19 11:40	03/06/19 19:53	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/06/19 11:40	03/06/19 19:53	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/06/19 19:53	7439-92-1	
Lithium	0.0017J	mg/L	0.050	0.00097	1	03/06/19 11:40	03/06/19 19:53	7439-93-2	
Molybdenum	0.0035J	mg/L	0.010	0.0019	1	03/06/19 11:40	03/06/19 19:53	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/06/19 11:40	03/06/19 19:53	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/06/19 19:53	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	0.000048J	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 14:29	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	0.14J	mg/L	0.30	0.029	1		03/07/19 20:28	16984-48-8	



### **ANALYTICAL RESULTS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

Date: 03/11/2019 11:49 AM

Sample: BGWC-7	Lab ID:	2615551002	Collecte	ed: 02/28/19	13:32	Received: 03/	01/19 16:22 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/06/19 20:16	7440-36-0	
Arsenic	0.0011J	mg/L	0.0050	0.00057	1	03/06/19 11:40	03/06/19 20:16	7440-38-2	
Barium	0.041	mg/L	0.010	0.00078	1	03/06/19 11:40	03/06/19 20:16	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/06/19 11:40	03/07/19 14:12	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/06/19 20:16	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/06/19 11:40	03/06/19 20:16	7440-47-3	
Cobalt	0.00067J	mg/L	0.010	0.00052	1	03/06/19 11:40	03/06/19 20:16	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/06/19 20:16	7439-92-1	
Lithium	0.0086J	mg/L	0.050	0.00097	1	03/06/19 11:40	03/06/19 20:16	7439-93-2	
Molybdenum	0.016	mg/L	0.010	0.0019	1	03/06/19 11:40	03/06/19 20:16	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/06/19 11:40	03/06/19 20:16	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/06/19 20:16	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EP	A 7470A			
Mercury	0.000053J	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 14:39	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	0.23J	mg/L	0.30	0.029	1		03/07/19 21:37	16984-48-8	



### **ANALYTICAL RESULTS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

Date: 03/11/2019 11:49 AM

Sample: BGWC-12	Lab ID:	2615551003	Collecte	ed: 02/28/19	15:14	Received: 03/	01/19 16:22 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/06/19 20:21	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00057	1	03/06/19 11:40	03/06/19 20:21	7440-38-2	
Barium	0.033	mg/L	0.010	0.00078	1	03/06/19 11:40	03/06/19 20:21	7440-39-3	
Beryllium	0.000076J	mg/L	0.0030	0.000050	1	03/06/19 11:40	03/07/19 14:18	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/06/19 20:21	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/06/19 11:40	03/06/19 20:21	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/06/19 11:40	03/06/19 20:21	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/06/19 20:21	7439-92-1	
Lithium	0.0011J	mg/L	0.050	0.00097	1	03/06/19 11:40	03/06/19 20:21	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/06/19 11:40	03/06/19 20:21	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/06/19 11:40	03/06/19 20:21	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/06/19 20:21	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EP	A 7470A			
Mercury	0.000058J	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 14:41	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	0.18J	mg/L	0.30	0.029	1		03/07/19 22:00	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

Date: 03/11/2019 11:49 AM

QC Batch: 23535 Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury

Associated Lab Samples: 2615551001, 2615551002, 2615551003

METHOD BLANK: 105394 Matrix: Water

Associated Lab Samples: 2615551001, 2615551002, 2615551003

Blank Reporting

Parameter Units Result Limit MDL Analyzed Qualifiers

Mercury mg/L 0.000050J 0.00050 0.000036 03/05/19 14:25

LABORATORY CONTROL SAMPLE: 105395

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury mg/L 0.0025 0.0026 102 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 105396 105397

MS MSD 2615551001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 0.0025 0.0027 0.0022 75-125 20 Mercury mg/L 0.000048J 0.0025 104 87 18

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

Date: 03/11/2019 11:49 AM

QC Batch: 23687 Analysis Method: EPA 6020B
QC Batch Method: EPA 3005A Analysis Description: 6020B MET

Associated Lab Samples: 2615551001, 2615551002, 2615551003

METHOD BLANK: 106016 Matrix: Water

Associated Lab Samples: 2615551001, 2615551002, 2615551003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	mg/L	ND	0.0030	0.00078	03/06/19 18:24	
Arsenic	mg/L	ND	0.0050	0.00057	03/06/19 18:24	
Barium	mg/L	ND	0.010	0.00078	03/06/19 18:24	
Beryllium	mg/L	ND	0.0030	0.000050	03/06/19 18:24	
Cadmium	mg/L	ND	0.0010	0.000093	03/06/19 18:24	
Chromium	mg/L	ND	0.010	0.0016	03/06/19 18:24	
Cobalt	mg/L	ND	0.010	0.00052	03/06/19 18:24	
Lead	mg/L	ND	0.0050	0.00027	03/06/19 18:24	
Lithium	mg/L	ND	0.050	0.00097	03/06/19 18:24	
Molybdenum	mg/L	ND	0.010	0.0019	03/06/19 18:24	
Selenium	mg/L	ND	0.010	0.0014	03/06/19 18:24	
Thallium	mg/L	ND	0.0010	0.00014	03/06/19 18:24	

LABORATORY CONTROL SAMPL	E: 106017					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	mg/L	0.1	0.11	108	80-120	
Arsenic	mg/L	0.1	0.10	101	80-120	
Barium	mg/L	0.1	0.10	104	80-120	
Beryllium	mg/L	0.1	0.10	101	80-120	
Cadmium	mg/L	0.1	0.10	102	80-120	
Chromium	mg/L	0.1	0.10	102	80-120	
Cobalt	mg/L	0.1	0.10	102	80-120	
Lead	mg/L	0.1	0.10	102	80-120	
Lithium	mg/L	0.1	0.10	102	80-120	
Molybdenum	mg/L	0.1	0.10	105	80-120	
Selenium	mg/L	0.1	0.10	104	80-120	
Thallium	mg/L	0.1	0.10	102	80-120	

MATRIX SPIKE & MATRIX SP	IKE DUPLIC	CATE: 10601	8		106019							
Parameter	Units	2615551001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec	RPD	Max RPD	Qual
Antimony	mg/L		0.1	0.1	0.10	0.11	105	107	75-125		20	
Arsenic	mg/L	0.0058	0.1	0.1	0.11	0.11	101	103	75-125	2	20	
Barium	mg/L	0.053	0.1	0.1	0.15	0.16	102	106	75-125	3	20	
Beryllium	mg/L	ND	0.1	0.1	0.10	0.10	101	101	75-125	0	20	
Cadmium	mg/L	ND	0.1	0.1	0.099	0.10	99	100	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### **REPORT OF LABORATORY ANALYSIS**

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Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

Date: 03/11/2019 11:49 AM

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	CATE: 106018	8	106019								
Parameter	Units	2615551001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium	mg/L	ND	0.1	0.1	0.10	0.10	102	102	75-125	0	20	
Cobalt	mg/L	ND	0.1	0.1	0.099	0.10	99	100	75-125	1	20	
Lead	mg/L	ND	0.1	0.1	0.098	0.098	98	98	75-125	0	20	
Lithium	mg/L	0.0017J	0.1	0.1	0.096	0.095	95	94	75-125	1	20	
Molybdenum	mg/L	0.0035J	0.1	0.1	0.10	0.11	101	104	75-125	3	20	
Selenium	mg/L	ND	0.1	0.1	0.10	0.11	103	106	75-125	3	20	
Thallium	mg/L	ND	0.1	0.1	0.098	0.10	98	100	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

Date: 03/11/2019 11:49 AM

QC Batch: 23823 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 2615551001, 2615551002, 2615551003

METHOD BLANK: 106696 Matrix: Water

Associated Lab Samples: 2615551001, 2615551002, 2615551003

Blank Reporting

Parameter Units Result Limit MDL Analyzed Qualifiers

Fluoride mg/L ND 0.30 0.029 03/07/19 19:43

LABORATORY CONTROL SAMPLE: 106697

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Fluoride mg/L 10 9.8 98 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 106698 106699

MS MSD 2615551001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Fluoride 10 90-110 0 mg/L 0.14J 10 10 10.0 99 98 15

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **ANALYTE QUALIFIERS**

Date: 03/11/2019 11:49 AM

B Analyte was detected in the associated method blank.



### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615551

Date: 03/11/2019 11:49 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2615551001	BGWC-10	EPA 3005A	23687	EPA 6020B	23738
2615551002	BGWC-7	EPA 3005A	23687	EPA 6020B	23738
2615551003	BGWC-12	EPA 3005A	23687	EPA 6020B	23738
2615551001	BGWC-10	EPA 7470A	23535	EPA 7470A	23568
2615551002	BGWC-7	EPA 7470A	23535	EPA 7470A	23568
2615551003	BGWC-12	EPA 7470A	23535	EPA 7470A	23568
2615551001	BGWC-10	EPA 300.0	23823		
2615551002	BGWC-7	EPA 300.0	23823		
2615551003	BGWC-12	EPA 300.0	23823		

Pace Analytical

CHAIN-OF-CUSTODY / A
The Chain-of-Custody is a LEGAL DOC

WO#:2615551

invoice Information:

Required Project Information: Report To: Joju Abraham Geosyntec

Copy To:

Georgia Power - Coal Combustion Residuals

Required Client Information:

Company: Address:

2480 Maner Road Atlanta, GA 30339

Company Name:

Attention

ŏ

3 SAMPLE CONDITIONS ≥ State / Location Received on Residual Chlorine (Y/N) 280 TEMP in C 1622 TIME Steele DATE Signed: 2/28/19 161 DATE 2 Radium 226, 228 3 betsy.mcdaniel@pacelabs.com, ACCEPTED BY / AFFILIATION Metals 6020/7470 (CCR list TDS, Cl, F, SO4 Brian N/A Analyses Test Other Methanol Na2S2O3 HOBN Pace Project Manager: HCI EONH M M M Pace Profile #: Address: Pace Quote: H2SO4 TIME Unpreserved # OF CONTAINERS Ċ SAMPLER NAME AND SIGNATURE J SAMPLE TEMP AT COLLECTION PRINT Name of SAMPLER: DATE TIME END DATE COLLECTED RELINQUISHED BY / AFFILIATION Plant Bowen Ash Pond 221 Wah TIME 6 444 1352 6 429P1574 SCS10348606 START SAMPLE TYPE (G=GRAB C=COMP) 0 ourchase Order #: MATRIX CODE (see valid codes to left) Project Name: Project #: CODE WY WY SIL OL WP AR OT TS MATRIX
Uninking Water
Water
Waste Water
Product
Soul/Solid
Oil
Wipe
Anr
Chher
Tissue 13GMC-10 One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique ADDITIONAL COMMENTS 126W-12 3601-7 SAMPLE ID jabraham@southernco.com (404)506-7239 Requested Due Date: Email: 3 4 2 9 7 # WBTI 2 9 F œ 0

Page 14 of 15

(N/A)

(N/A)

Sealed Cooler

Custody

Back

SIGNATURE of SAMPLER:

(N/A)

Samples

# Pace Analytical

### Sample Condition Upon Receipt

Client Name: Googla lower Coal Combustion

WO#: 2615551

PM: BN	ı

Due Date: 03/08/19

CLIENT: GAPower-CCR

Courier: Fed Ex UPS USPS Client	t 🗆 Cor	nmer	cial [	Pace Other	Proj. Due Date:
Tracking #:  Custody Seal on Cooler/Box Present:  yes	no	5	Seals ir	ntact:  yes  n	Proj. Name:
Packing Material: Bubble Wrap Bubble	_	_		Other	
Thermometer Used 283	Type of		_		Samples on ice, cooling process has begun
Cooler Temperature 2.8°			ssue is	Frozen: Yes No	Date and Initials of person examining contents: 3/1/19
Temp should be above freezing to 6°C			-	Comments:	
Chain of Custody Present:	₩Yes □				
Chain of Custody Filled Out:	☐Yes □				
Chain of Custody Relinquished:	□Yes □				
Sampler Name & Signature on COC:	Yes [		$\overline{}$		
Samples Arrived within Hold Time:	□ Yes [		□N/A		
Short Hold Time Analysis (<72hr):	□Yes 5		□n/a	6.	
Rush Turn Around Time Requested:	□Yes [	N/vo	□n/a	7	
Sufficient Volume:	Ø∕es [	□No	□n/a	8.	
Correct Containers Used:	☑Yes [	□No	□n/a	9.	
-Pace Containers Used:	ØYes I	□No_	□N/A		
Containers Intact:	<b>□</b> Yes	□No	□N/A	10.	
Filtered volume received for Dissolved tests	□Yes	□No	<b>₩</b> /A	11.	
Sample Labels match COC:	Yes	□No	□n/a	12.	
-Includes date/time/ID/Analysis Matrix:	WT				
All containers needing preservation have been checked.	<b>⊠</b> Yes	□No	□n/a	13.	
All containers needing preservation are found to be in compliance with EPA recommendation.	Wes	□No	□n/a		
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	□Yes	<b>⊡</b> 46₀		Initial when completed	Lot # of added preservative
Samples checked for dechlorination:	□Yes	□No	□\/N/A	14.	
Headspace in VOA Vials ( >6mm):	□Yes	□No	DIN/A	15.	
Trip Blank Present:	□Yes	□No	DAN/A	16.	
Trip Blank Custody Seals Present	□Yes	□No	[⊇N/A		
Pace Trip Blank Lot # (if purchased):					
Client Notification/ Resolution:					Field Data Required? Y / N
Person Contacted: Robert M	1-11		_Date	Time: 3/4/20	19
Comments/ Resolution: Per coas-	-Ita	<u>~</u> €	, 7	Lese samp	oles set only
App. IV list; no	CI,	<u>~</u>	504	, ~ TDS;	no B, no Ca,
Project Manager Review: BMJ	$\overline{}$				Date: 3/4/2019





March 22, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2615552

### Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on March 01, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta



(770)734-4200



### **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615552

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

**Arkansas Certification** 

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Missouri Certification #: 235

Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



### **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615552

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
2615552001	BGWC-10	Water	02/28/19 12:26	03/01/19 16:22	
2615552002	BGWC-7	Water	02/28/19 13:32	03/01/19 16:22	
2615552003	BGWC-12	Water	02/28/19 15:14	03/01/19 16:22	



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615552

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2615552001	BGWC-10	EPA 9315		1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615552002	BGWC-7	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615552003	BGWC-12	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615552

Sample: BGWC-10 PWS:	<b>Lab ID: 26155520</b> Site ID:	O1 Collected: 02/28/19 12:26 Sample Type:	Received:	03/01/19 16:22	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		1.11 ± 0.245 (0.171) C:88% T:NA	pCi/L	03/13/19 20:28	13982-63-3	
Radium-228		0.768 ± 0.429 (0.764) C:71% T:81%	pCi/L	03/18/19 16:07	7 15262-20-1	
Total Radium	Total Radium Calculation	1.88 ± 0.674 (0.935)	pCi/L	03/19/19 14:44	1 7440-14-4	



#### **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615552

Sample: BGWC-7 Lab ID: 2615552002 Collected: 02/28/19 13:32 Received: 03/01/19 16:22 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315 0.883 ± 0.206 (0.160) Radium-226 pCi/L 03/13/19 20:28 13982-63-3 C:91% T:NA EPA 9320  $0.495 \pm 0.403 \quad (0.800)$ 03/18/19 16:07 15262-20-1 Radium-228 pCi/L C:77% T:77% Total Radium Total Radium 1.38 ± 0.609 (0.960) pCi/L 03/19/19 14:44 7440-14-4 Calculation



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615552

Sample: BGWC-12 PWS:	<b>Lab ID: 26155520</b> Site ID:	O3 Collected: 02/28/19 15:14 Sample Type:	Received:	03/01/19 16:22	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.461 ± 0.142 (0.157) C:96% T:NA	pCi/L	03/13/19 20:28	13982-63-3	
Radium-228		0.575 ± 0.339 (0.607) C:75% T:86%	pCi/L	03/18/19 16:07	7 15262-20-1	
Total Radium	Total Radium Calculation	1.04 ± 0.481 (0.764)	pCi/L	03/19/19 14:44	7440-14-4	



#### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615552

QC Batch: 332854 Analysis Method: EPA 9320
QC Batch Method: EPA 9320 Analysis Description: 9320 Radium 228

Associated Lab Samples: 2615552001, 2615552002, 2615552003

METHOD BLANK: 1619642 Matrix: Water

Associated Lab Samples: 2615552001, 2615552002, 2615552003

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.381 ± 0.318 (0.630) C:77% T:89%
 pCi/L
 03/18/19 16:07

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



#### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615552

QC Batch: 332856 Analysis Method: EPA 9315

QC Batch Method: EPA 9315 Analysis Description: 9315 Total Radium

Associated Lab Samples: 2615552001, 2615552002, 2615552003

METHOD BLANK: 1619644 Matrix: Water

Associated Lab Samples: 2615552001, 2615552002, 2615552003

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-226 0.265  $\pm$  0.116 (0.162) C:92% T:NA pCi/L 03/13/19 20:28

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



#### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615552

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 03/22/2019 09:06 AM

PASI-PA Pace Analytical Services - Greensburg



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615552

Date: 03/22/2019 09:06 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytica Batch
2615552001	BGWC-10	EPA 9315	332856		
2615552002	BGWC-7	EPA 9315	332856		
2615552003	BGWC-12	EPA 9315	332856		
2615552001	BGWC-10	EPA 9320	332854		
2615552002	BGWC-7	EPA 9320	332854		
2615552003	BGWC-12	EPA 9320	332854		
2615552001	BGWC-10	Total Radium Calculation	334415		
2615552002	BGWC-7	Total Radium Calculation	334415		
2615552003	BGWC-12	Total Radium Calculation	334415		

WO#: 2615552 CHAIN-OF-CUSTODY / A
The Chain-of-Custody is a LEGAL DOC

Invoice information:

Required Project Information: Joju Abraham

Section B

Report To: Joju Abraha Copy To: Geosyntec

Georgia Power - Coal Combustion Residuals 2480 Maner Road

Required Client Information:

Email: jabraham@southernco.com Atlanta, GA 30339

Attention:

Company Name: Address: Pace Quote:

Plant Bowen Ash Pond

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Regulatory Agency

SAMPLE CONDITIONS ⋛ State / Location Residual Chlorine (Y/V) 250 1622 TIME. Requested Analysis Filtered (Y/N 3-1-19 DATE Radium 226, 226 Ņ 2 betsy modaniel@pacelabs.com Metals 6020/7470 (CCR list) ACCEPTED BY / AFFILIATION TDS, CI, F, SO4 N/A Analyses Test loneriteM Na2S2O3 える NgOH Pace Project Manager Pace Profile # 315 ЮН EONH M M H2SO4 Unpreserved TIME Ċ # OF CONTAINERS J J SAMPLER NAME AND SIGNATURE SAMPLE TEMP AT COLLECTION TIME END DATE solution and COLLECTED 2221 Wash RELINQUISHED BY LAFFILLATION TIME 6 444 1332 6 423POSTH Purchase Order # SCS10348605 Project Name Plant Bowen Ash P START SAMPLE TYPE (G-GRAB C-COMP) 8 MATRIX CODE (see valid codes to left) Project #. MATRIX
Dirphing Water
Waste Water
Waste Water
Product
O::
Wyce
Wyce
O::
One
Tissue 15(らりし- 10 One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique AUDITIONAL COMMERTS 36x-12 136006-7 SAMPLE ID Phone: (404)506-7239 Requested Due Date # WBTI 9 12 m S ဖ ∞ F Page 12 of 13

(N/A) pelui selames

(N/A)

Cooler

(N/A)

TEMP in C

Steele DATE Signed: 6/28/19

/Brian

PRINT Name of SAMPLER: SIGNATURE of SAMPLER:

<del>9</del>01 но ремесе он

	Sample	Condition	pon necespe	WO# : 26	15552
Pace Analyt	<i>ical</i> Client Name: <u>ட</u> ூ	pargia Pov	Jer Combustion	PM: BM CLIENT: GAPos	Due Date: 03/08/1
Courier:  Fed Ex	☐ UPS ☐ USPS ☑ Client ☐			Proj. Dur	
Custody Seal on Co	oler/Box Present:  yes	no Seals i	ntact:	no 💴	
Packing Material: [	i		Other		
Thermometer Used		e of Ice: Wer			ing process has begun of person examining
Cooler Temperature	2.8° Bio	_	s Frozen: Yes No	contents: 3	
Temp should be above			Comments:		
Chain of Custody Pro		s 🗆 No 🗆 N/A			
Chain of Custody Fill		es □No □N/A			
Chain of Custody Re	iniquione s.	es □No □N/A	-		
Sampler Name & Sig	nature on COC:	es 🗆 No 🗆 N/A	4		
Samples Arrived with	hin Hold Time:	es 🗆 No 🗆 N/A	5.		
Short Hold Time A	nalysis (<72hr):	es ⊠No □N/A	6		
Rush Turn Around	Time Requested:	es Dino On/A	7.		
Sufficient Volume:	Ū.	es □No □N/A	8		
Correct Containers	Used: 💟	es 🗆 No 🗆 N/A	9.		
-Pace Containers	s Used:	es 🗆 No 🗆 N/A			
Containers Intact:	Q	es □No □N/A	10.		
Filtered volume rece	eived for Dissolved tests	Yes □No DAN/A	11.		
Sample Labels mate	ch COC:	res □No □N/A	12.		
-Includes date/til	me/ID/Analysis Matrix: W	<u> </u>			
All containers needing	reservation have been checked.	res ONO ON/A	13.		
All containers needing compliance with EPA	preservation are found to be in recommendation.	Yes □No □N/A	Initial when	Lot # of added	
exceptions: VOA, colifor	m, TOC. O&G, WI-DRO (water)	Yes DMo	completed	preservative	
Samples checked f	or dechlorination:	Yes □No □N/A	14.		
Headspace in VOA		Yes □No □KN//	15.		
Trip Blank Present		Yes □No □Nii	16.	 	
Trip Blank Custody	_	Yes □No ☑N/	4	-  -  -	
Pace Trip Blank Lo					
Client Notification	v/ Resolution:			Field Data Requir	ed? Y / N
	tacted:	Date	e/fime:		
Comments/ Res	olution:				
		<del>                                     </del>			
Project Manag	er Review:			Date:_	
Note: Whenever th Certification Office (	ere is a discrepancy affecting North Car i.e out of hold, incorrect preservative,	olina compliance s out of temp, incom	amples, a copy of this ect containers)		orth Carolina DEHNR





March 08, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on March 01, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta







# **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

**Atlanta Certification IDs** 

110 Technology Parkway Peachtree Corners, GA 30092

Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001

Virginia Certification #: 460204



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2615560001	BGWC-30	Water	03/01/19 11:35	03/01/19 16:57
2615560002	BGWC-22	Water	03/01/19 11:40	03/01/19 16:57
2615560003	BGWC-24	Water	03/01/19 12:04	03/01/19 16:57
2615560004	BGWC-25	Water	03/01/19 13:04	03/01/19 16:57
2615560005	BGWC-19	Water	03/01/19 13:56	03/01/19 16:57
2615560006	BGWC-23	Water	03/01/19 14:07	03/01/19 16:57
2615560007	Dup-2	Water	03/01/19 00:00	03/01/19 16:57
2615560008	FBL030119	Water	03/01/19 14:40	03/01/19 16:57
2615560009	EQBL030119	Water	03/01/19 14:45	03/01/19 16:57



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2615560001	BGWC-30	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615560002	BGWC-22	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615560003	BGWC-24	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615560004	BGWC-25	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
615560005	BGWC-19	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615560006	BGWC-23	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
615560007	Dup-2	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615560008	FBL030119	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615560009	EQBL030119	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

Sample: BGWC-30	Lab ID:	2615560001	Collecte	ed: 03/01/19	11:35	Received: 03/	01/19 16:57 Ma	atrix: Water	
			Report						
Parameters —	Results	Units	Limit	MDL .	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/06/19 20:27	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00057	1	03/06/19 11:40	03/06/19 20:27	7440-38-2	
Barium	0.078	mg/L	0.010	0.00078	1	03/06/19 11:40	03/06/19 20:27	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/06/19 11:40	03/07/19 14:23	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/06/19 20:27	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/06/19 11:40	03/06/19 20:27	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/06/19 11:40	03/06/19 20:27	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/06/19 20:27	7439-92-1	
Lithium	0.0044J	mg/L	0.050	0.00097	1	03/06/19 11:40	03/06/19 20:27	7439-93-2	
Molybdenum	0.011	mg/L	0.010	0.0019	1	03/06/19 11:40	03/06/19 20:27	7439-98-7	
Selenium	0.010J	mg/L	0.010	0.0014	1	03/06/19 11:40	03/06/19 20:27	7782-49-2	
Thallium	0.00024J	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/06/19 20:27	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	nod: EF	PA 7470A			
Mercury	0.00010J	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 14:44	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	0.24J	mg/L	0.30	0.029	1		03/05/19 11:14	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

Sample: BGWC-22	Lab ID:	2615560002	Collecte	ed: 03/01/19	11:40	Received: 03/01/19 16:57 Matrix: Water				
			Report							
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A				
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/06/19 20:33	7440-36-0		
Arsenic	0.0011J	mg/L	0.0050	0.00057	1	03/06/19 11:40	03/06/19 20:33	7440-38-2		
Barium	0.087	mg/L	0.010	0.00078	1	03/06/19 11:40	03/06/19 20:33	7440-39-3		
Beryllium	0.00012J	mg/L	0.0030	0.000050	1	03/06/19 11:40	03/07/19 14:29	7440-41-7		
Cadmium	0.00013J	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/06/19 20:33	7440-43-9		
Chromium	ND	mg/L	0.010	0.0016	1	03/06/19 11:40	03/06/19 20:33	7440-47-3		
Cobalt	0.017	mg/L	0.010	0.00052	1	03/06/19 11:40	03/06/19 20:33	7440-48-4		
Lead	0.00033J	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/06/19 20:33	7439-92-1		
Lithium	0.022J	mg/L	0.050	0.00097	1	03/06/19 11:40	03/06/19 20:33	7439-93-2		
Molybdenum	0.039	mg/L	0.010	0.0019	1	03/06/19 11:40	03/06/19 20:33	7439-98-7		
Selenium	ND	mg/L	0.010	0.0014	1	03/06/19 11:40	03/06/19 20:33	7782-49-2		
Thallium	0.00074J	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/06/19 20:33	7440-28-0		
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EF	PA 7470A				
Mercury	0.000042J	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 14:46	7439-97-6	В	
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0							
Fluoride	0.34	mg/L	0.30	0.029	1		03/05/19 11:37	16984-48-8		



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

Sample: BGWC-24	Lab ID:	2615560003	Collecte	ed: 03/01/19	12:04	Received: 03/	01/19 16:57 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/06/19 20:50	7440-36-0	
Arsenic	0.0032J	mg/L	0.025	0.0028	5	03/06/19 11:40	03/07/19 14:48	7440-38-2	D3
Barium	0.12	mg/L	0.010	0.00078	1	03/06/19 11:40	03/06/19 20:50	7440-39-3	
Beryllium	ND	mg/L	0.015	0.00025	5	03/06/19 11:40	03/07/19 14:48	7440-41-7	D3
Cadmium	0.0058	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/06/19 20:50	7440-43-9	
Chromium	ND	mg/L	0.050	0.0078	5	03/06/19 11:40	03/07/19 14:48	7440-47-3	D3
Cobalt	0.0055J	mg/L	0.050	0.0026	5	03/06/19 11:40	03/07/19 14:48	7440-48-4	D3
Lead	ND	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/06/19 20:50	7439-92-1	
Lithium	0.0068J	mg/L	0.050	0.00097	1	03/06/19 11:40	03/06/19 20:50	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/06/19 11:40	03/06/19 20:50	7439-98-7	
Selenium	ND	mg/L	0.050	0.0068	5	03/06/19 11:40	03/07/19 14:48	7782-49-2	D3
Thallium	0.00070J	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/06/19 20:50	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Meth	nod: EF	PA 7470A			
Mercury	0.00093	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 14:53	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	1.0	mg/L	0.30	0.029	1		03/05/19 12:00	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

Sample: BGWC-25	Lab ID:	2615560004	Collecte	ed: 03/01/19	13:04	Received: 03/	01/19 16:57 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL .	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/06/19 20:56	7440-36-0	
Arsenic	0.0022J	mg/L	0.0050	0.00057	1	03/06/19 11:40	03/07/19 14:54	7440-38-2	
Barium	0.021	mg/L	0.010	0.00078	1	03/06/19 11:40	03/06/19 20:56	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/06/19 11:40	03/07/19 14:54	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/06/19 20:56	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/06/19 11:40	03/07/19 14:54	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/06/19 11:40	03/07/19 14:54	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/06/19 20:56	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/06/19 11:40	03/06/19 20:56	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/06/19 11:40	03/06/19 20:56	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/06/19 11:40	03/07/19 14:54	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/06/19 20:56	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	0.000047J	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 14:56	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	0.12J	mg/L	0.30	0.029	1		03/05/19 13:13	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

Sample: BGWC-19	Lab ID:	2615560005	Collecte	ed: 03/01/19	13:56	Received: 03/	01/19 16:57 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL .	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/06/19 21:02	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00057	1	03/06/19 11:40	03/07/19 14:59	7440-38-2	
Barium	0.028	mg/L	0.010	0.00078	1	03/06/19 11:40	03/06/19 21:02	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/06/19 11:40	03/07/19 14:59	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/06/19 21:02	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/06/19 11:40	03/07/19 14:59	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/06/19 11:40	03/07/19 14:59	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/06/19 21:02	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/06/19 11:40	03/06/19 21:02	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/06/19 11:40	03/06/19 21:02	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/06/19 11:40	03/07/19 14:59	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/06/19 21:02	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	0.000050J	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 14:58	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	0.14J	mg/L	0.30	0.029	1		03/05/19 13:36	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

Sample: BGWC-23	Lab ID:	2615560006	Collecte	ed: 03/01/19	14:07	Received: 03/01/19 16:57 Matrix: Water			
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/07/19 16:52	7440-36-0	
Arsenic	0.0023J	mg/L	0.0050	0.00057	1	03/06/19 11:40	03/07/19 16:52	7440-38-2	
Barium	0.097	mg/L	0.010	0.00078	1	03/06/19 11:40	03/07/19 16:52	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/06/19 11:40	03/07/19 16:52	7440-41-7	
Cadmium	0.00019J	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/07/19 16:52	7440-43-9	
Chromium	0.0033J	mg/L	0.010	0.0016	1	03/06/19 11:40	03/07/19 16:52	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/06/19 11:40	03/07/19 16:52	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/07/19 16:52	7439-92-1	
Lithium	0.017J	mg/L	0.050	0.00097	1	03/06/19 11:40	03/07/19 16:52	7439-93-2	
Molybdenum	0.013	mg/L	0.010	0.0019	1	03/06/19 11:40	03/07/19 16:52	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/06/19 11:40	03/07/19 16:52	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/07/19 16:52	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	0.000044J	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 15:00	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	0.38	mg/L	0.30	0.029	1		03/05/19 13:59	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

Sample: Dup-2	Lab ID:	2615560007	Collecte	ed: 03/01/19	00:00	Received: 03/01/19 16:57 Matrix: Water			
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/06/19 21:07	7440-36-0	
Arsenic	0.0022J	mg/L	0.0050	0.00057	1	03/06/19 11:40	03/07/19 15:05	7440-38-2	
Barium	0.086	mg/L	0.010	0.00078	1	03/06/19 11:40	03/06/19 21:07	7440-39-3	
Beryllium	0.00013J	mg/L	0.0030	0.000050	1	03/06/19 11:40	03/07/19 15:05	7440-41-7	
Cadmium	0.00013J	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/06/19 21:07	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/06/19 11:40	03/07/19 15:05	7440-47-3	
Cobalt	0.017	mg/L	0.010	0.00052	1	03/06/19 11:40	03/07/19 15:05	7440-48-4	
Lead	0.00031J	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/06/19 21:07	7439-92-1	
Lithium	0.021J	mg/L	0.050	0.00097	1	03/06/19 11:40	03/06/19 21:07	7439-93-2	
Molybdenum	0.038	mg/L	0.010	0.0019	1	03/06/19 11:40	03/06/19 21:07	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/06/19 11:40	03/07/19 15:05	7782-49-2	
Thallium	0.00071J	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/06/19 21:07	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	nod: EF	PA 7470A			
Mercury	0.000047J	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 15:03	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	0.37	mg/L	0.30	0.029	1		03/05/19 14:21	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

Sample: FBL030119	Lab ID:	2615560008	Collecte	ed: 03/01/19	14:40	Received: 03/	01/19 16:57 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL .	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/07/19 17:21	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00057	1	03/06/19 11:40	03/07/19 17:21	7440-38-2	
Barium	ND	mg/L	0.010	0.00078	1	03/06/19 11:40	03/07/19 17:21	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/06/19 11:40	03/07/19 17:21	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/07/19 17:21	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/06/19 11:40	03/07/19 17:21	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/06/19 11:40	03/07/19 17:21	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/07/19 17:21	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/06/19 11:40	03/07/19 17:21	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/06/19 11:40	03/07/19 17:21	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/06/19 11:40	03/07/19 17:21	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/07/19 17:21	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	0.000047J	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 15:05	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	ND	mg/L	0.30	0.029	1		03/05/19 16:16	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

Sample: EQBL030119	Lab ID:	2615560009	Collecte	ed: 03/01/19	14:45	Received: 03/	01/19 16:57 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/06/19 11:40	03/07/19 17:27	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00057	1	03/06/19 11:40	03/07/19 17:27	7440-38-2	
Barium	ND	mg/L	0.010	0.00078	1	03/06/19 11:40	03/07/19 17:27	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/06/19 11:40	03/07/19 17:27	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/06/19 11:40	03/07/19 17:27	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/06/19 11:40	03/07/19 17:27	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/06/19 11:40	03/07/19 17:27	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/06/19 11:40	03/07/19 17:27	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/06/19 11:40	03/07/19 17:27	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/06/19 11:40	03/07/19 17:27	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/06/19 11:40	03/07/19 17:27	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/06/19 11:40	03/07/19 17:27	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	0.000043J	mg/L	0.00050	0.000036	1	03/04/19 15:02	03/05/19 15:07	7439-97-6	В
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	ND	mg/L	0.30	0.029	1		03/05/19 16:39	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

QC Batch: 23535 Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury

Associated Lab Samples: 2615560001, 2615560002, 2615560003, 2615560004, 2615560005, 2615560006, 2615560007, 2615560008,

2615560009

METHOD BLANK: 105394 Matrix: Water

Associated Lab Samples: 2615560001, 2615560002, 2615560003, 2615560004, 2615560005, 2615560006, 2615560007, 2615560008,

2615560009

Blank Reporting Units MDL Qualifiers Parameter Result Limit Analyzed Mercury mg/L 0.000050J 0.00050 0.000036 03/05/19 14:25 LABORATORY CONTROL SAMPLE: 105395 LCS LCS Spike % Rec Parameter Units Conc. Result % Rec Limits Qualifiers 102 80-120 Mercury mg/L 0.0025 0.0026

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 105396 105397 MS MSD 2615551001 Spike Spike MS MSD MS MSD % Rec Max RPD RPD Parameter Units Result Conc. % Rec % Rec Limits Conc. Result Result Qual Mercury mg/L 0.000048J 0.0025 0.0025 0.0027 0.0022 104 75-125 18 20

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

QC Batch: 23687 Analysis Method: EPA 6020B
QC Batch Method: EPA 3005A Analysis Description: 6020B MET

Associated Lab Samples: 2615560001, 2615560002, 2615560003, 2615560004, 2615560005, 2615560007

METHOD BLANK: 106016 Matrix: Water

Associated Lab Samples: 2615560001, 2615560002, 2615560003, 2615560004, 2615560005, 2615560007

		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Antimony	mg/L	ND	0.0030	0.00078	03/06/19 18:24	
Arsenic	mg/L	ND	0.0050	0.00057	03/06/19 18:24	
Barium	mg/L	ND	0.010	0.00078	03/06/19 18:24	
Beryllium	mg/L	ND	0.0030	0.000050	03/06/19 18:24	
Cadmium	mg/L	ND	0.0010	0.000093	03/06/19 18:24	
Chromium	mg/L	ND	0.010	0.0016	03/06/19 18:24	
Cobalt	mg/L	ND	0.010	0.00052	03/06/19 18:24	
Lead	mg/L	ND	0.0050	0.00027	03/06/19 18:24	
Lithium	mg/L	ND	0.050	0.00097	03/06/19 18:24	
Molybdenum	mg/L	ND	0.010	0.0019	03/06/19 18:24	
Selenium	mg/L	ND	0.010	0.0014	03/06/19 18:24	
Thallium	mg/L	ND	0.0010	0.00014	03/06/19 18:24	

LABORATORY CONTROL SAMPLE:	106017					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	mg/L	0.1	0.11	108	80-120	
Arsenic	mg/L	0.1	0.10	101	80-120	
Barium	mg/L	0.1	0.10	104	80-120	
Beryllium	mg/L	0.1	0.10	101	80-120	
Cadmium	mg/L	0.1	0.10	102	80-120	
Chromium	mg/L	0.1	0.10	102	80-120	
Cobalt	mg/L	0.1	0.10	102	80-120	
Lead	mg/L	0.1	0.10	102	80-120	
Lithium	mg/L	0.1	0.10	102	80-120	
Molybdenum	mg/L	0.1	0.10	105	80-120	
Selenium	mg/L	0.1	0.10	104	80-120	
Thallium	mg/L	0.1	0.10	102	80-120	

MATRIX SPIKE & MATRIX SP	IKE DUPLIC	CATE: 10601	8		106019							
Parameter	Units	2615551001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/L	ND	0.1	0.1	0.10	0.11	105	107	75-125	2	20	
Arsenic	mg/L	0.0058	0.1	0.1	0.11	0.11	101	103	75-125	2	20	
Barium	mg/L	0.053	0.1	0.1	0.15	0.16	102	106	75-125	3	20	
Beryllium	mg/L	ND	0.1	0.1	0.10	0.10	101	101	75-125	0	20	
Cadmium	mg/L	ND	0.1	0.1	0.099	0.10	99	100	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	ATE: 10601	8		106019							
Parameter	Units	2615551001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium	mg/L	ND	0.1	0.1	0.10	0.10	102	102	75-125	0	20	
Cobalt	mg/L	ND	0.1	0.1	0.099	0.10	99	100	75-125	1	20	
Lead	mg/L	ND	0.1	0.1	0.098	0.098	98	98	75-125	0	20	
Lithium	mg/L	0.0017J	0.1	0.1	0.096	0.095	95	94	75-125	1	20	
Molybdenum	mg/L	0.0035J	0.1	0.1	0.10	0.11	101	104	75-125	3	20	
Selenium	mg/L	ND	0.1	0.1	0.10	0.11	103	106	75-125	3	20	
Thallium	mg/L	ND	0.1	0.1	0.098	0.10	98	100	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Thallium

Date: 03/08/2019 03:40 PM

QC Batch: 23688 Analysis Method: EPA 6020B
QC Batch Method: EPA 3005A Analysis Description: 6020B MET

Associated Lab Samples: 2615560006, 2615560008, 2615560009

METHOD BLANK: 106022 Matrix: Water

Associated Lab Samples: 2615560006, 2615560008, 2615560009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
					7 (1101) 200	
Antimony	mg/L	ND	0.0030	0.00078	03/07/19 16:35	
Arsenic	mg/L	ND	0.0050	0.00057	03/07/19 16:35	
Barium	mg/L	ND	0.010	0.00078	03/07/19 16:35	
Beryllium	mg/L	ND	0.0030	0.000050	03/07/19 16:35	
Cadmium	mg/L	ND	0.0010	0.000093	03/07/19 16:35	
Chromium	mg/L	ND	0.010	0.0016	03/07/19 16:35	
Cobalt	mg/L	ND	0.010	0.00052	03/07/19 16:35	
Lead	mg/L	ND	0.0050	0.00027	03/07/19 16:35	
Lithium	mg/L	ND	0.050	0.00097	03/07/19 16:35	
Molybdenum	mg/L	ND	0.010	0.0019	03/07/19 16:35	
Selenium	mg/L	ND	0.010	0.0014	03/07/19 16:35	
Thallium	mg/L	ND	0.0010	0.00014	03/07/19 16:35	

LABORATORY CONTROL SAMPLE:	106023					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	mg/L	0.1	0.10	102	80-120	
Arsenic	mg/L	0.1	0.098	98	80-120	
Barium	mg/L	0.1	0.098	98	80-120	
Beryllium	mg/L	0.1	0.095	95	80-120	
Cadmium	mg/L	0.1	0.097	97	80-120	
Chromium	mg/L	0.1	0.10	100	80-120	
Cobalt	mg/L	0.1	0.095	95	80-120	
Lead	mg/L	0.1	0.095	95	80-120	
Lithium	mg/L	0.1	0.096	96	80-120	
Molybdenum	mg/L	0.1	0.098	98	80-120	
Selenium	mg/L	0.1	0.10	100	80-120	

0.1

mg/L

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	CATE: 10602	4		106025							
Parameter	Units	2615560006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/L	ND	0.1	0.1	0.10	0.11	102	105	75-125	3	20	
Arsenic	mg/L	0.0023J	0.1	0.1	0.10	0.11	101	104	75-125	3	20	
Barium	mg/L	0.097	0.1	0.1	0.21	0.22	112	121	75-125	4	20	
Beryllium	mg/L	ND	0.1	0.1	0.093	0.099	93	99	75-125	6	20	
Cadmium	mg/L	0.00019J	0.1	0.1	0.095	0.096	95	96	75-125	1	20	

0.094

94

80-120

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	ATE: 106024	4 MS	MSD	106025							
Davassatas	Llaita	2615560006	Spike	Spike	MS	MSD	MS 0/ Date	MSD	% Rec	DDD	Max	0
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chromium	mg/L	0.0033J	0.1	0.1	0.10	0.11	98	104	75-125	5	20	
Cobalt	mg/L	ND	0.1	0.1	0.094	0.098	93	97	75-125	4	20	
Lead	mg/L	ND	0.1	0.1	0.090	0.093	90	93	75-125	3	20	
Lithium	mg/L	0.017J	0.1	0.1	0.12	0.12	100	106	75-125	5	20	
Molybdenum	mg/L	0.013	0.1	0.1	0.11	0.12	101	105	75-125	3	20	
Selenium	mg/L	ND	0.1	0.1	0.099	0.10	99	103	75-125	4	20	
Thallium	mg/L	ND	0.1	0.1	0.092	0.094	92	94	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

QC Batch: 23574 Analysis Method: EPA 300.0 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

2615560001, 2615560002, 2615560003, 2615560004, 2615560005, 2615560006, 2615560007, 2615560008, Associated Lab Samples:

2615560009

METHOD BLANK: 105501			N	/latrix: Wa	ter								
	615560001, 615560009	2615560002, 2	615560003	, 2615560	004, 261556	60005, 2615	56000	06, 26155	60007	, 2615560	)008,		
			Blank	. R	eporting								
Parameter		Units	Result	t	Limit	MDL		Analy	zed	Qua	alifiers	_	
Fluoride		mg/L		ND	0.30	0	.029	03/05/19	03:59				
LABORATORY CONTROL SA	MPLE: 10	)5502											
			Spike	LCS		LCS		Rec					
Parameter		Units	Conc.	Resu	ılt '	% Rec	L	imits	Qu	alifiers	_		
Fluoride		mg/L	10		10.3	103		90-110					
MATRIX SPIKE & MATRIX SP	IKE DUPLIC	CATE: 105500	3		105504								
			MS	MSD						_			
Parameter	Units	2615503012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Re		SD Rec	% Rec Limits	RPD	Max RPD	Qua
Parameter Fluoride	Units mg/L		Spike	Spike	_	_	_					RPD	Qua
	mg/L	Result	Spike Conc.	Spike Conc.	Result	Result	_	ec % l	Rec	Limits		RPD	Qua
Fluoride	mg/L	Result 0.22J	Spike Conc.	Spike Conc.	Result	Result	_	ec % l	Rec	Limits		RPD	Qua
Fluoride	mg/L	Result 0.22J	Spike Conc.	Spike Conc. 10	Result 10.1	Result 10.1	_	99 % I	Rec	90-110		RPD	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



#### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **ANALYTE QUALIFIERS**

Date: 03/08/2019 03:40 PM

- B Analyte was detected in the associated method blank.
- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615560

Date: 03/08/2019 03:40 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2615560001	BGWC-30	EPA 3005A	23687	EPA 6020B	23738
2615560002	BGWC-22	EPA 3005A	23687	EPA 6020B	23738
2615560003	BGWC-24	EPA 3005A	23687	EPA 6020B	23738
2615560004	BGWC-25	EPA 3005A	23687	EPA 6020B	23738
2615560005	BGWC-19	EPA 3005A	23687	EPA 6020B	23738
2615560006	BGWC-23	EPA 3005A	23688	EPA 6020B	23745
2615560007	Dup-2	EPA 3005A	23687	EPA 6020B	23738
2615560008	FBL030119	EPA 3005A	23688	EPA 6020B	23745
2615560009	EQBL030119	EPA 3005A	23688	EPA 6020B	23745
2615560001	BGWC-30	EPA 7470A	23535	EPA 7470A	23568
2615560002	BGWC-22	EPA 7470A	23535	EPA 7470A	23568
2615560003	BGWC-24	EPA 7470A	23535	EPA 7470A	23568
2615560004	BGWC-25	EPA 7470A	23535	EPA 7470A	23568
2615560005	BGWC-19	EPA 7470A	23535	EPA 7470A	23568
2615560006	BGWC-23	EPA 7470A	23535	EPA 7470A	23568
2615560007	Dup-2	EPA 7470A	23535	EPA 7470A	23568
2615560008	FBL030119	EPA 7470A	23535	EPA 7470A	23568
2615560009	EQBL030119	EPA 7470A	23535	EPA 7470A	23568
2615560001	BGWC-30	EPA 300.0	23574		
2615560002	BGWC-22	EPA 300.0	23574		
2615560003	BGWC-24	EPA 300.0	23574		
2615560004	BGWC-25	EPA 300.0	23574		
2615560005	BGWC-19	EPA 300.0	23574		
2615560006	BGWC-23	EPA 300.0	23574		
2615560007	Dup-2	EPA 300.0	23574		
2615560008	FBL030119	EPA 300.0	23574		
2615560009	EQBL030119	EPA 300.0	23574		

Pace Analytical

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

SAMPLE ID   Source   Part	Section A Required Cl	Section A Required Client Information:	Section B Required Project Information:	Section C	i		Page.
SAMPLE ID   September   Sept	Company:	Georgia Power - Coal Combustion Residuals	Report To. Join Abraham	Attention			
SAMPLE ID   One Owner type   Part Color	Address	2480 Maner Road	1	Company Name			
SAMPLE ID   One Character group   Programme Control   Programme	- 1	Atlanta, GA 30339		Address			Regulatory Agency
SAMPLEID  SAMPLE	- 1			Pace Quote			
AMPLE ID    AMPLE ID   AMPRE ID   AMPLE ID   AMPLE ID   AMPLE ID   AMPRE ID	Phone	06-7239	Plant Bowen Ash Por	Pace Project Mana		Jul.	State / Location
SAMPLE ID  Secure 10	Rednested	Jue Date.	Project #		315		GA
SAMPLE ID  One Country Country  Sea of Country					Re	quested Analysis Filtered (Y/	(X)
SAMPLE ID  One Conversion Prince  One Convers		MATRIX	COMP)		N/A		
Sample by Doo.   Page			WW WY (See valid code (Ge GRAB Ca	1 COLLECTIO	1seT	8	( <b>N</b> /Y) en
86WC-30  W[63/14 135]  B6WC-21  GCWC-24  W[63/14 136]  B6WC-25  W[63/14 136]  W[63/14 136]  W[63/14 136]  W[63/14 136]  W[63/14 140]  W[63/14	# МЭТІ		# 5 % # 6 %	HSSO4  OP CONTAINED  OP CONTAINED  OF CONTAINED	NaOH Na2S2O3 Methanol Other Analyses	SS. 3SS mulbe?	Residual Chlori
86WC-27  WG 3//1912DH 61 5 KK K  86WC-25  WG 3//1913DH 141 3 KK K  86WC-19  B6WC-25  WG 3//1913DH 141 3 KK K  B6WC-17  B6WC-25  WG 3//1914DH 141 3 KK K  B6WC-17  WG 3//1914DH 141 3 KK K  B6WC-27  WG 3//1914DH 141 3 KK K  B6WC-18  B6WC-19  WG 3//1914DH 141 3 KK K	-	BGWC-30	-	7	*	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
86wc-27       w63//191204       61 5       xx x       xx x<	2	86WC-22	WT 6 3/1/19 1140	-	~	~	_
BGWC-25	8	8GWC - 24	WT G 3/1/19 1204	_	-	~	Ce
86wc-19       wf63v/q1356       µ 1 3       x x x x         86wc-23       wf63v/q14b0       µ 1 3       x x x x         DuvP-2       wf63v/q14b0       µ 1 3       x x x x         FBL030119       wf63v/q14b0       µ 1 3       x x x x         FBL030119       wf63v/q14b0       µ 1 3       x x x x         FBL030119       wf63v/q14b0       µ 1 3       x x x x         FBL030119       wf63v/q14b0       µ 1 3       x x x x         ARAPLER NARE BRANE BRANE BRANE BRANE AND SIGHATURE       BALL 1 3       x x x x	4	B6WC-25	WT G 3/19 1304	_		×	7
BGWC-23	2	B6WC-19	WTG 3/19 1356	_		×	<b>.</b>
DULP-2	9	BGWC - 23	TOH1 9/1/6 1407	_		×	
FBL03019  GABL03019  WTG 3//9 1445  H 1 3 XXXX  XXX X  XXX X  XXX X  ACOTTOMAL CONNEITS  RELINGUISHED BY AFFILLATION  DATE  TWE  ACCEPTED BY AFFILLATION  SAMPLER NAME AND SIGNATURE	7	DWP-2	WT 6 3/19 -	_	×	×	
ADSTRONAL CONNEITS  ADSTRONAL CONNEITS  ADSTRONAL CONNEITS  ADDRESS NAME R NAME AND SIGNATURE  SAMPLER NAME AND SIGNATURE  THE ACCEPTED BY IAFFILLATION  DATE TAME  ACCEPTED BY IAFFILLATION  DATE  THE CONNEITS  SAMPLER NAME AND SIGNATURE	80	FBL030119	WTG 3/1/4 1440	_	-	×	8
AIGHTONAL COMMENTS RELINGUISHED BY LAFFLLATION DATE TIME ACCEPTED BY LAFFLLATION DATE TIME 3/1/19 1/57 Charge Time 3/1/19 1/57 Charge Time 3/1/19 1/57 Charge Time SAMPLER NAME AND SIGNATURE	6	E QBL030119	WTG 3//F 1445	_		×	
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SAMPLER NAME AND SIGNATURE		ADDITIONAL COMMETTS	RELINGUISHED BY LAFFILIATION.		ACCEPTED BY LAFFILIATION	DATE	
SAMPLER NAME AND SIGNATURE			111111111111111111111111111111111111111	1	2. 611	1 3/1/19	57 42 V W V
				1-1	an O an		/ / / / / / / / / / / / / / / / / / / /
	P		SAMPLER NAME	AND SIGNATURE			U

MOH: 2615560

Samples (N/N)

Custody Sealed Cooler (V/V)

(AW) Received on TEMP in C

DATE Signed: 3/1 /19

PRINT Name of SAMPLER: Robert Mull, Kevin Stephenson, Audrey Craften

SIGNATURE OF SAMPLER: ONLINE CONTINE

Sar	nple Condition	Upon Recei	WO#	2615560
Pace Analytical Client Name	: GA Po	wec	PM: BM	Due Date: 03/08/1 GAPower-CCR
Courier: Fed Ex UPS USPS Client Tracking #:  Custody Seal on Cooler/Box Present: yes		☐ Pace Other		Proj. Due Date: Proj. Name:
Packing Material: Bubble Wrap Bubble	Bags None	Other		
Thermometer Used 4,82	Type of Ice: Wet	Blue None	☐ Sample:	s on ice, cooling process has begun
Cooler Temperature  O8  Temp should be above freezing to 6°C	Biological Tissue	is Frozen: Yes No Comments:		and Initials of person examining ntents:
Chain of Custody Present:	Yes No N/A	1.		
Chain of Custody Filled Out:	Yes ONO ON/A	2.		
Chain of Custody Relinquished:	ØYes □No □N/A	3.		
Sampler Name & Signature on COC:	DYes ONO ON/A	4.		
Samples Arrived within Hold Time:	₽Yes □No □N/A	5.		
Short Hold Time Analysis (<72hr):	□Yes ⊡No □N/A	6.		
Rush Turn Around Time Requested:	□Yes ☑No □N/A	7.		
Sufficient Volume:	TYES NO N/A	8.		
Correct Containers Used:	☐Yes ☐No ☐N/A	9.		
-Pace Containers Used:	Pres □No □N/A			
Containers Intact:	ØYes □No □N/A	10.		
Filtered volume received for Dissolved tests	□Yes □No □NĀ	11.		
Sample Labels match COC:	☐Yes ☐No ☐N/A	12.		
-Includes date/time/ID/Analysis Matrix:	W			
All containers needing preservation have been checked.	DYES ONO ON/A	13.		
All containers needing preservation are found to be in compliance with EPA recommendation.	□Yes □No □N/A			
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	□Yes ☑No	Initial when completed	Lot # of preserv	
Samples checked for dechlorination:	□Yes □No □N/A		process	
Headspace in VOA Vials ( >6mm):	□Yes □No □N/A			
Trip Blank Present:	□Yes □No ☑N/A			
Trip Blank Custody Seals Present	□Yes □No ₽N/A	1		
Pace Trip Blank Lot # (if purchased):	2.00 2.10 2.10			
Client Notification/ Resolution:	5	-	Field Da	ata Required? Y / N
Person Contacted: Comments/ Resolution:	Date/	ime:	-	
Comments/ Resolution.				
			8151A WS0	

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Project Manager Review:

Date:





March 22, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on March 01, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta



(770)734-4200



#### **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

**Arkansas Certification** 

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040 Guam Certification

Hawaii Certification Idaho Certification Illinois Certification Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Missouri Certification #: 235

Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2615561001	BGWC-30	Water	03/01/19 11:35	03/01/19 16:57
2615561002	BGWC-22	Water	03/01/19 11:40	03/01/19 16:57
2615561003	BGWC-24	Water	03/01/19 12:04	03/01/19 16:57
2615561004	BGWC-25	Water	03/01/19 13:04	03/01/19 16:57
2615561005	BGWC-19	Water	03/01/19 13:56	03/01/19 16:57
2615561006	BGWC-23	Water	03/01/19 14:07	03/01/19 16:57
2615561007	Dup-2	Water	03/01/19 00:00	03/01/19 16:57
2615561008	FBL030119	Water	03/01/19 14:40	03/01/19 16:57
2615561009	EQBL030119	Water	03/01/19 14:45	03/01/19 16:57



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2615561001	BGWC-30	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615561002	BGWC-22	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615561003	BGWC-24	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615561004	BGWC-25	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615561005	BGWC-19	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615561006	BGWC-23	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615561007	Dup-2	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615561008	FBL030119	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2615561009	EQBL030119	EPA 9315	JJY	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

Sample: BGWC-30 Lab ID: 2615561001 Collected: 03/01/19 11:35 Received: 03/01/19 16:57 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315 1.79 ± 0.417 (0.354) Radium-226 pCi/L 03/13/19 18:51 13982-63-3 C:48% T:NA EPA 9320 0.678 ± 0.391 (0.703) Radium-228 pCi/L 03/18/19 16:08 15262-20-1 C:76% T:81% Total Radium Total Radium  $2.47 \pm 0.808$  (1.06) pCi/L 03/21/19 13:16 7440-14-4 Calculation



Project: Plant Bowen Ash Pond

Total Radium

Calculation

Pace Project No.: 2615561

Total Radium

Sample: BGWC-22 Lab ID: 2615561002 Collected: 03/01/19 11:40 Received: 03/01/19 16:57 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315  $2.20 \pm 0.410 \quad (0.243)$ Radium-226 pCi/L 03/13/19 18:51 13982-63-3 C:93% T:NA EPA 9320 1.12 ± 0.501 (0.818) Radium-228 pCi/L 03/18/19 16:08 15262-20-1 C:73% T:75%

pCi/L

03/21/19 13:16 7440-14-4

3.32 ± 0.911 (1.06)



Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

Sample: BGWC-24 PWS:	<b>Lab ID: 26155610</b> Site ID:	O3 Collected: 03/01/19 12:04 Sample Type:	Received:	03/01/19 16:57	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		2.69 ± 0.717 (0.522) C:87% T:NA	pCi/L	03/14/19 08:17	13982-63-3	
Radium-228		0.676 ± 0.537 (1.06) C:72% T:80%	pCi/L	03/18/19 18:20	) 15262-20-1	
Total Radium	Total Radium Calculation	3.37 ± 1.25 (1.58)	pCi/L	03/21/19 13:16	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

Sample: BGWC-25 PWS:	<b>Lab ID: 26155610</b> Site ID:	O4 Collected: 03/01/19 13:04 Sample Type:	Received:	03/01/19 16:57	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.324 ± 0.125 (0.165) C:97% T:NA	pCi/L	03/13/19 18:5	1 13982-63-3	
Radium-228		0.310 ± 0.464 (1.000) C:75% T:79%	pCi/L	03/18/19 18:20	0 15262-20-1	
Total Radium	Total Radium Calculation	0.634 ± 0.589 (1.17)	pCi/L	03/21/19 13:10	6 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

Sample: BGWC-19 Lab ID: 2615561005 Collected: 03/01/19 13:56 Received: 03/01/19 16:57 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315 0.515 ± 0.177 (0.233) Radium-226 pCi/L 03/13/19 18:51 13982-63-3 C:88% T:NA EPA 9320 0.474 ± 0.390 (0.780) Radium-228 pCi/L 03/20/19 11:11 15262-20-1 C:69% T:86% Total Radium Total Radium  $0.989 \pm 0.567$  (1.01) pCi/L 03/21/19 13:16 7440-14-4 Calculation



Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

Sample: BGWC-23 PWS:	<b>Lab ID: 26155610</b> Site ID:	O06 Collected: 03/01/19 14:07 Sample Type:	Received:	03/01/19 16:57	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		1.27 ± 0.271 (0.185) C:92% T:NA	pCi/L	03/13/19 18:5	1 13982-63-3	
Radium-228		0.971 ± 0.497 (0.890) C:69% T:84%	pCi/L	03/20/19 11:11	1 15262-20-1	
Total Radium	Total Radium Calculation	2.24 ± 0.768 (1.08)	pCi/L	03/21/19 13:10	6 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

Sample: Dup-2 Lab ID: 2615561007 Collected: 03/01/19 00:00 Received: 03/01/19 16:57 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315 4.94 ± 0.867 (0.339) Radium-226 pCi/L 03/13/19 18:51 13982-63-3 C:47% T:NA  $0.309 \pm 0.497$  (1.08) EPA 9320 03/18/19 18:19 15262-20-1 Radium-228 pCi/L C:73% T:83% Total Radium Total Radium 5.25 ± 1.36 (1.42) pCi/L 03/21/19 13:16 7440-14-4 Calculation



Project: Plant Bowen Ash Pond

Calculation

Pace Project No.: 2615561

Sample: FBL030119 Lab ID: 2615561008 Collected: 03/01/19 14:40 Received: 03/01/19 16:57 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315 0.309 ± 0.116 (0.146) Radium-226 pCi/L 03/13/19 20:28 13982-63-3 C:98% T:NA EPA 9320  $0.420 \pm 0.420 \quad (0.869)$ Radium-228 pCi/L 03/20/19 11:11 15262-20-1 C:67% T:85% Total Radium Total Radium  $0.729 \pm 0.536$  (1.02) pCi/L 03/21/19 13:16 7440-14-4



Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

Sample: EQBL030119 Lab ID: 2615561009 Collected: 03/01/19 14:45 Received: 03/01/19 16:57 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315 0.657 ± 0.321 (0.369) Radium-226 pCi/L 03/14/19 08:13 13982-63-3 C:95% T:NA EPA 9320 0.411 ± 0.320 (0.627) Radium-228 pCi/L 03/20/19 11:11 15262-20-1 C:73% T:89% Total Radium Total Radium 1.07 ± 0.641 (0.996) pCi/L 03/21/19 13:16 7440-14-4 Calculation



Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

QC Batch: 332854 Analysis Method: EPA 9320
QC Batch Method: EPA 9320 Analysis Description: 9320 Radium 228

Associated Lab Samples: 2615561001, 2615561002, 2615561003, 2615561004, 2615561007

METHOD BLANK: 1619642 Matrix: Water

Associated Lab Samples: 2615561001, 2615561002, 2615561003, 2615561004, 2615561007

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.381 ± 0.318 (0.630) C:77% T:89%
 pCi/L
 03/18/19 16:07

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

QC Batch: 332855 Analysis Method: EPA 9320

QC Batch Method: EPA 9320 Analysis Description: 9320 Radium 228

Associated Lab Samples: 2615561005, 2615561006, 2615561008, 2615561009

METHOD BLANK: 1619643 Matrix: Water

Associated Lab Samples: 2615561005, 2615561006, 2615561008, 2615561009

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-228 0.349 ± 0.394 (0.830) C:71% T:87% pCi/L 03/20/19 11:10

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

QC Batch: 332856 Analysis Method: EPA 9315

QC Batch Method: EPA 9315 Analysis Description: 9315 Total Radium

Associated Lab Samples: 2615561001, 2615561002, 2615561003, 2615561004, 2615561005, 2615561006, 2615561007, 2615561008

METHOD BLANK: 1619644 Matrix: Water

Associated Lab Samples: 2615561001, 2615561002, 2615561003, 2615561004, 2615561005, 2615561006, 2615561007, 2615561008

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-226
 0.265 ± 0.116 (0.162) C:92% T:NA
 pCi/L
 03/13/19 20:28

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



EPA 9315

Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

QC Batch: 332857

Analysis Method:

QC Batch Method: EPA 9315 Analysis Description: 9315 Total Radium

Associated Lab Samples: 2615561009

METHOD BLANK: 1619645 Matrix: Water

Associated Lab Samples: 2615561009

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-226 0.424  $\pm$  0.162 (0.231) C:91% T:NA pCi/L 03/13/19 18:54

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



#### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 03/22/2019 09:06 AM

PASI-PA Pace Analytical Services - Greensburg



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615561

Date: 03/22/2019 09:06 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2615561001	BGWC-30	EPA 9315	332856		
2615561002	BGWC-22	EPA 9315	332856		
2615561003	BGWC-24	EPA 9315	332856		
2615561004	BGWC-25	EPA 9315	332856		
2615561005	BGWC-19	EPA 9315	332856		
2615561006	BGWC-23	EPA 9315	332856		
2615561007	Dup-2	EPA 9315	332856		
2615561008	FBL030119	EPA 9315	332856		
2615561009	EQBL030119	EPA 9315	332857		
2615561001	BGWC-30	EPA 9320	332854		
2615561002	BGWC-22	EPA 9320	332854		
2615561003	BGWC-24	EPA 9320	332854		
2615561004	BGWC-25	EPA 9320	332854		
2615561005	BGWC-19	EPA 9320	332855		
2615561006	BGWC-23	EPA 9320	332855		
2615561007	Dup-2	EPA 9320	332854		
2615561008	FBL030119	EPA 9320	332855		
2615561009	EQBL030119	EPA 9320	332855		
2615561001	BGWC-30	Total Radium Calculation	334844		
2615561002	BGWC-22	Total Radium Calculation	334844		
2615561003	BGWC-24	Total Radium Calculation	334844		
2615561004	BGWC-25	Total Radium Calculation	334844		
2615561005	BGWC-19	Total Radium Calculation	334844		
2615561006	BGWC-23	Total Radium Calculation	334844		
2615561007	Dup-2	Total Radium Calculation	334844		
2615561008	FBL030119	Total Radium Calculation	334844		
2615561009	EQBL030119	Total Radium Calculation	334844		

Pace Analytical

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A	Section A	Section B	n <u>1</u>	Section C	- cojies			
Company	Garring Down - Coal Combustion Residuals	Report To. Join Abraham	A	Attention				
Address			0	Company Name	ie.			T
	Allanta GA 30339		A	Address				Regulatory Agency
Email	abraham@southernco.com	Purchase Order # SCS10348606	I.	Pace Quote				(angles (paningar)
Phone	(404)506-7239 Fax	Project Name Plant Bowen Ash Pond	a.	Pace Project Manager	Nanager betsy modaniel@pacelabs com	el@pacelabs	s com.	State / Location
Requested	Requested Due Date:	Project #.	a.	Pace Profile #	315			
						-	Requested Analysis Filtered (Y/N)	Filtered (Y/N)
	MATRIX	(fiel of a	NO		Preservatives	N/A	11	
	SAMPLE ID Control Control	S & Y W W T W W T W W T W W T W W T W W T W W T W W T W W T W W T W W W T W W W T W		es				(N/A) əu
ITEM #	One Character per box. Were (A.Z. 0-9/, -) Char Sample Ids must be unique fassue	S # # P # P	A 4M9T 3J4MA2	HS2O4 # OF CONTAINER	HCI Methanol Methanol HWO3	S98VISnA -08 .7 .9 807 	Radium 226, 22	Residual Chloric
-	BGWC-30	WT G 3//19 1135		-	3	*	*	
2	8GWC-22	wr 6 3/1/19 1140		- 9	5	× ×	×	7
က		WT G 3/1/19 1204		- 9	5	×	×	
4	BGWC-25	WT G 3/19 1304		٦ -	3	×	~	7
2	BGWC - 19	WTG 3/1/9 1356	_	- 7	3	×		
9	8GWC - 23	TO41 91/1/6 97m	-	_	3	×	×	
7	Dur-2	WT 6 3/19 -	1	- 7	3	×	×	
00	FBL030119	WT G 3//19 1440	7	-	3	×	×	20
6	E Q&L 030119	WTG 3/1/9 1445		- 4	3	×	×	8
10 1								
12								
	ADDITIONAL GOMPHETTS	RECINGUISHED BY LAFFILIATION	DATE	TIME	A SACEPTED BY LA	LAFFILIATION	TOTAL DELTA	DE TIME SAMPLE COMPITIONS
		Mr Alles	3/1/14	1657	Chan &	De	We 3/1	311/19 1657 48 Y W Y
P		SAMPLER NAME	ER NAME AND SIGNATURE	9				
age 2	10#:2615561	PRINT Name	PRINT Name of SAMPLER: Robert Mull	obert 1	Cevin	Stephenson,	Andrey	bjes et oqy
0 of 2	O of Z	SIGNATURE	SIGNATURE OF SAMPLER: CHANNE CHANTE	Working C	whort	DA	DATE Signed: 3/1 /19	M∃T
Ī					>			

Sar	nple Conditio	n Upon Rece	MO#	2615561
Pace Analytical Client Name	: GA Pa	wec	PM: BM	Due Date: 03/29/19 GAPower-CCR
Courier:  Fed Ex UPS USPS Clien				Proj. Due Date: Proj. Name:
Custody Seal on Cooler/Box Present:	☐ no Seal	s intact:	☐ no	
Packing Material: Bubble Wrap Bubble	Bags None	Other		
Thermometer Used 4,80	Type of Ice: We	Blue None		es on ice, cooling process has begun
Cooler Temperature 08> Temp should be above freezing to 6°C	Biological Tissu	e is Frozen: Yes N Comments:	0	te and Initials of person examining ontents:
Chain of Custody Present:	Yes ONO ON	A 1.		
Chain of Custody Filled Out:	Yes ONO ON	A 2.		
Chain of Custody Relinquished:	ØYes □No □N/	A 3.		
Sampler Name & Signature on COC:	Dves ONO ON	A 4.		
Samples Arrived within Hold Time:	₽Yes □No □N	A 5.		
Short Hold Time Analysis (<72hr):	□Yes ⊡No □N	A 6.		
Rush Turn Around Time Requested:	□Yes ☑No □N	A 7.		
Sufficient Volume:	dves □No □N	/A 8.		
Correct Containers Used:	□Yes □No □N	/A 9.		
-Pace Containers Used:	Wes ONO ON	/A		
Containers Intact:	ØYes □No □N	/A 10.		
Filtered volume received for Dissolved tests	□Yes □No □M	A 11.		
Sample Labels match COC:	□Yes □No □N	/A 12.		
-Includes date/time/ID/Analysis Matrix:	W			
All containers needing preservation have been checked.	DVS DNO DN	/A 13.		
All containers needing preservation are found to be in compliance with EPA recommendation.	□Yes □No □N	/A		
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	□Yes ☑No	Initial when completed	100000000	of added vative
Samples checked for dechlorination:	□Yes □No □N			
Headspace in VOA Vials ( >6mm):		/A 15.		
Trip Blank Present:	□Yes □No ☑N	/A 16.		
Trip Blank Custody Seals Present	□Yes □No ₽	/A		
Pace Trip Blank Lot # (if purchased):				
Client Notification/ Resolution:			Field I	Data Required? Y / N
Person Contacted:	Dat	e/Time:		23
Comments/ Resolution:				-
			8151A W	SC
Project Manager Review:				Date:

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)





March 18, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on March 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta







# **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

**Atlanta Certification IDs** 

110 Technology Parkway Peachtree Corners, GA 30092

Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001

Virginia Certification #: 460204



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

Lab ID	Sample ID	Matrix	Date Collected	Date Received	
2615876001	BGWC-14	Water	03/06/19 13:55	03/09/19 09:05	
2615876002	FBL030619	Water	03/06/19 15:18	03/09/19 09:05	
2615876003	EQBL030619	Water	03/06/19 15:23	03/09/19 09:05	



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2615876001	BGWC-14	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615876002	FBL030619	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2615876003	EQBL030619	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1



# **ANALYTICAL RESULTS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

Date: 03/18/2019 06:10 PM

Sample: BGWC-14	Lab ID:	2615876001	Collecte	ed: 03/06/19	13:55	Received: 03/	09/19 09:05 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/13/19 10:50	03/14/19 14:12	7440-36-0	
Arsenic	0.0015J	mg/L	0.0050	0.00057	1	03/13/19 10:50	03/14/19 14:12	7440-38-2	
Barium	0.065	mg/L	0.010	0.00078	1	03/13/19 10:50	03/14/19 14:12	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/13/19 10:50	03/14/19 14:12	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/13/19 10:50	03/14/19 14:12	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/13/19 10:50	03/14/19 14:12	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/13/19 10:50	03/14/19 14:12	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/13/19 10:50	03/14/19 14:12	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/13/19 10:50	03/14/19 14:12	7439-93-2	
Molybdenum	0.013	mg/L	0.010	0.0019	1	03/13/19 10:50	03/14/19 14:12	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/13/19 10:50	03/14/19 14:12	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/13/19 10:50	03/14/19 14:12	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00050	0.000036	1	03/13/19 08:25	03/13/19 11:57	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	0.88	mg/L	0.30	0.029	1		03/12/19 22:30	16984-48-8	



# **ANALYTICAL RESULTS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

Date: 03/18/2019 06:10 PM

Sample: FBL030619	Lab ID:	2615876002	Collecte	ed: 03/06/19	15:18	Received: 03/	09/19 09:05 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/13/19 10:50	03/14/19 14:18	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00057	1	03/13/19 10:50	03/14/19 14:18	7440-38-2	
Barium	ND	mg/L	0.010	0.00078	1	03/13/19 10:50	03/14/19 14:18	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/13/19 10:50	03/14/19 14:18	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/13/19 10:50	03/14/19 14:18	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/13/19 10:50	03/14/19 14:18	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/13/19 10:50	03/14/19 14:18	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/13/19 10:50	03/14/19 14:18	7439-92-1	
Lithium	0.0020J	mg/L	0.050	0.00097	1	03/13/19 10:50	03/14/19 14:18	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/13/19 10:50	03/14/19 14:18	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/13/19 10:50	03/14/19 14:18	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/13/19 10:50	03/14/19 14:18	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EP	A 7470A			
Mercury	ND	mg/L	0.00050	0.000036	1	03/13/19 08:25	03/13/19 12:09	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	ND	mg/L	0.30	0.029	1		03/12/19 23:38	16984-48-8	



# **ANALYTICAL RESULTS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

Date: 03/18/2019 06:10 PM

Sample: EQBL030619	Lab ID:	2615876003	Collecte	ed: 03/06/19	15:23	Received: 03/	09/19 09:05 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00078	1	03/13/19 10:50	03/14/19 14:24	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00057	1	03/13/19 10:50	03/14/19 14:24	7440-38-2	
Barium	ND	mg/L	0.010	0.00078	1	03/13/19 10:50	03/14/19 14:24	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	03/13/19 10:50	03/14/19 14:24	7440-41-7	
Cadmium	ND	mg/L	0.0010	0.000093	1	03/13/19 10:50	03/14/19 14:24	7440-43-9	
Chromium	ND	mg/L	0.010	0.0016	1	03/13/19 10:50	03/14/19 14:24	7440-47-3	
Cobalt	ND	mg/L	0.010	0.00052	1	03/13/19 10:50	03/14/19 14:24	7440-48-4	
Lead	ND	mg/L	0.0050	0.00027	1	03/13/19 10:50	03/14/19 14:24	7439-92-1	
Lithium	ND	mg/L	0.050	0.00097	1	03/13/19 10:50	03/14/19 14:24	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.0019	1	03/13/19 10:50	03/14/19 14:24	7439-98-7	
Selenium	ND	mg/L	0.010	0.0014	1	03/13/19 10:50	03/14/19 14:24	7782-49-2	
Thallium	ND	mg/L	0.0010	0.00014	1	03/13/19 10:50	03/14/19 14:24	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00050	0.000036	1	03/13/19 08:25	03/13/19 12:16	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	ND	mg/L	0.30	0.029	1		03/13/19 00:00	16984-48-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

Date: 03/18/2019 06:10 PM

QC Batch: 24123 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury

Associated Lab Samples: 2615876001, 2615876002, 2615876003

METHOD BLANK: 108124 Matrix: Water

Associated Lab Samples: 2615876001, 2615876002, 2615876003

Blank Reporting
Parameter Units Result Limit MDL Analyzed Qualifiers

Mercury mg/L ND 0.00050 0.00036 03/13/19 11:53

LABORATORY CONTROL SAMPLE: 108125

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury mg/L 0.0025 0.0026 103 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 108126 108127

MS MSD 2615876001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 0.0025 0.0025 0.0026 75-125 8 20 Mercury mg/L ND 0.0028 111 103

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

Lithium

Selenium

Thallium

Molybdenum

Date: 03/18/2019 06:10 PM

QC Batch: 24189 Analysis Method: EPA 6020B QC Batch Method: **EPA 3005A** Analysis Description: 6020B MET

Associated Lab Samples: 2615876001, 2615876002, 2615876003

METHOD BLANK: 108347 Matrix: Water

mg/L

mg/L

mg/L

mg/L

Associated Lab Samples: 2615876001, 2615876002, 2615876003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
- arameter					711019200	
Antimony	mg/L	ND	0.0030	0.00078	03/14/19 14:01	
Arsenic	mg/L	ND	0.0050	0.00057	03/14/19 14:01	
Barium	mg/L	ND	0.010	0.00078	03/14/19 14:01	
Beryllium	mg/L	ND	0.0030	0.000050	03/14/19 14:01	
Cadmium	mg/L	ND	0.0010	0.000093	03/14/19 14:01	
Chromium	mg/L	ND	0.010	0.0016	03/14/19 14:01	
Cobalt	mg/L	ND	0.010	0.00052	03/14/19 14:01	
Lead	mg/L	ND	0.0050	0.00027	03/14/19 14:01	
Lithium	mg/L	ND	0.050	0.00097	03/14/19 14:01	
Molybdenum	mg/L	ND	0.010	0.0019	03/14/19 14:01	
Selenium	mg/L	ND	0.010	0.0014	03/14/19 14:01	
Thallium	mg/L	ND	0.0010	0.00014	03/14/19 14:01	

LABORATORY CONTROL SAMPLE:	108348					
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	0.1	0.10	101	80-120	
Arsenic	mg/L	0.1	0.098	98	80-120	
Barium	mg/L	0.1	0.099	99	80-120	
Beryllium	mg/L	0.1	0.10	101	80-120	
Cadmium	mg/L	0.1	0.098	98	80-120	
Chromium	mg/L	0.1	0.099	99	80-120	
Cobalt	mg/L	0.1	0.097	97	80-120	
Lead	mg/L	0.1	0.095	95	80-120	

0.1

0.1

0.1

0.1

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	CATE: 10834	9		108350							
Parameter	Units	2615879006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	mg/L	ND	0.1	0.1	0.10	0.10	100	101	75-125	0	20	
Arsenic	mg/L	0.00085J	0.1	0.1	0.10	0.10	99	100	75-125	0	20	
Barium	mg/L	0.042	0.1	0.1	0.14	0.14	97	102	75-125	3	20	
Beryllium	mg/L	ND	0.1	0.1	0.095	0.098	95	98	75-125	3	20	
Cadmium	mg/L	ND	0.1	0.1	0.10	0.098	100	98	75-125	2	20	

0.10

0.099

0.10

0.095

101

99

101

95

80-120

80-120

80-120

80-120

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

Date: 03/18/2019 06:10 PM

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	CATE: 108349	9		108350							
Parameter	Units	2615879006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium	mg/L	ND	0.1	0.1	0.098	0.099	98	98	75-125	1	20	
Cobalt	mg/L	ND	0.1	0.1	0.096	0.097	96	97	75-125	1	20	
Lead	mg/L	ND	0.1	0.1	0.096	0.097	96	97	75-125	1	20	
Lithium	mg/L	0.0015J	0.1	0.1	0.096	0.10	94	99	75-125	5	20	
Molybdenum	mg/L	0.0061J	0.1	0.1	0.11	0.11	103	102	75-125	1	20	
Selenium	mg/L	ND	0.1	0.1	0.097	0.099	97	99	75-125	2	20	
Thallium	mg/L	ND	0.1	0.1	0.096	0.097	96	97	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

Date: 03/18/2019 06:10 PM

QC Batch: 24135 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 2615876001, 2615876002, 2615876003

METHOD BLANK: 108159 Matrix: Water

Associated Lab Samples: 2615876001, 2615876002, 2615876003

Blank Reporting
Parameter Units Result Limit MDL Analyzed Qualifiers

Fluoride mg/L ND 0.30 0.029 03/12/19 21:45

LABORATORY CONTROL SAMPLE: 108160

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Fluoride mg/L 10 9.5 95 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 108161 108162

MS MSD 2615876001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Fluoride 90-110 mg/L 0.88 10 10 10.0 10.1 92 92 15

MATRIX SPIKE SAMPLE: 108163

MS 2615876002 Spike MS % Rec % Rec Parameter Units Result Conc. Result Limits Qualifiers ND 9.6 Fluoride mg/L 10 96 90-110

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



#### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

Date: 03/18/2019 06:10 PM



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2615876

Date: 03/18/2019 06:10 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2615876001	BGWC-14	EPA 3005A	24189	EPA 6020B	24210
2615876002	FBL030619	EPA 3005A	24189	EPA 6020B	24210
2615876003	EQBL030619	EPA 3005A	24189	EPA 6020B	24210
2615876001	BGWC-14	EPA 7470A	24123	EPA 7470A	24183
2615876002	FBL030619	EPA 7470A	24123	EPA 7470A	24183
2615876003	EQBL030619	EPA 7470A	24123	EPA 7470A	24183
2615876001	BGWC-14	EPA 300.0	24135		
2615876002	FBL030619	EPA 300.0	24135		
2615876003	EQBL030619	EPA 300.0	24135		

Pace Analytical CHAIN OF CUSTODY RECORD

110 TECHNOLOGY PARKWAY, PEACHTREE CORNERS, GA 30092 Pace Analytical Services, Inc.

P PAGE: (770) 734-4200 : FAX (770) 734-4201 : www.asi-lab.com

5 - NaOH/ZnAc, ≤6°C 7 - <6°C not frozen 6 - Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, <6°C REMARKS/ADDITIONAL INFORMATION 2 - H2SO4, <6°C 4 - NaOH, <6°C P - PRODUCT 1 - HCI, ≤6°C PRESERVATION SL - SLUDGE L- LIQUID SD - SOLID 3 - HNO3 S- SOIL A- AIR FOR LAB USE ONLY WO#:2615876 \*MATRIX CODES DRINKING WATER SURFACE WATER GW - GROUNDWATER STORM WATER ww - wastewater A - AMBER GLASS G - CLEAR GLASS Entered into LIMS: CONTAINER TYPE V - VOA VIAL S - STERILE P - PLASTIC ST - STORM V W - WATER O - OTHER Tracking #: LAB#: - MS BAL - 0 Z D Z B W K DATE/TIME: 3/13/19/9 (LOLY DATE/TIME: FS OTHER CLIENT Cooler ID: ANALYSIS REQUESTED XIITH DEPOSIT COURIER # of Coolers Pace COC Revised N 822 USPS Not Present RELINQUISHED BY: SAMPLE SHIPPED V UPS FEO-EX Custody) Seat: Intact Broken No ELY 300 CONTAINER TYPE # of O O N F A - N E R O 7 7 J 1600 SAMPLE IDENTIFICATION Max. Ears wood 19 FR.030619 PO#: 5CS10348606 Sevices Geosynthe BC176-14 DATE/TIME: 3/6/19 110 DATECTIME Min. DATE/TIME CLIENT ADDRESS/PHONE NUMBER/FAX NUMBER CC Dur Pany Ash For 0 2 4 8 × × × Kes No NA 0024 Catter AHGALE, GA 30339 MATRIX REQUESTED COMPLETION DATE: Ser CODE Southern 30 3 Sover COPERTY AND TITLE PROJECT NAME/STATE Collection 1355 1518 2251 TIME ¥ ECEVIED BY LAB CLIENT NAME: Plant ECEIVED BY REPORT TO: Collection DATE S 3/11/19 PROJECT #: 3/6/19 3/16/19

ge 14 of 15

#### 0#:2615876 Sample Condition Upon Recei Pace Analytical Client Name: G Due Date: 03/18/19 CLIENT: GAPower-CCR Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other Proj. Due Date: Tracking #: Proj. Name: yes □ no Seals intact: Custody Seal on Cooler/Box Present: Bubble Bags None Other Packing Material: Bubble Wrap Type of Ice: Wet Blue None Samples on ice, cooling process has begun Thermometer Used Date and Initials of gerson examining Biological Tissue is Frozen: Yes No Cooler Temperature contents: 2 Comments: Temp should be above freezing to 6°C EYes □No □N/A Chain of Custody Present: ☑Yes □No □N/A Chain of Custody Filled Out: DYES DNo □N/A Chain of Custody Relinquished: Tres ONO □N/A 4. Sampler Name & Signature on COC: Yes No □N/A 5. Samples Arrived within Hold Time: □Yes □No □N/A 6. Short Hold Time Analysis (<72hr): □Yes ☑No □N/A 7. Rush Turn Around Time Requested: TYes No DN/A 8. Sufficient Volume: Tyes No N/A 9. Correct Containers Used: ☐Yes ☐No □N/A -Pace Containers Used: Yes No □N/A 10. Containers Intact: ☐Yes ☑No ☑N/A 11. Filtered volume received for Dissolved tests ☐Yes ☐No ☐N/A 12. Sample Labels match COC: -Includes date/time/ID/Analysis All containers needing preservation have been checked. ₽Yes □No □N/A 13 All containers needing preservation are found to be in Yes ONO ON/A compliance with EPA recommendation. Lot # of added Initial when ☐Yes ☐No exceptions: VOA, coliform, TOC, O&G, WI-DRO (water) completed preservative Samples checked for dechlorination: □Yes □No □WA Headspace in VOA Vials ( >6mm): □Yes □No IN/A 15. ☐Yes ☐No Trip Blank Present: IN/A/ Trip Blank Custody Seals Present ☐Yes ☐No Pace Trip Blank Lot # (if purchased): Client Notification/ Resolution: Field Data Required? Y / N Person Contacted: Date/Time: Comments/ Resolution:

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Project Manager Review:

Date:

# First Semiannual Sampling Event April 2019





May 07, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This revised report replaces the one issued on 4/15/2019. The report has been revised to correct metals units and target list per consultant request. No other changes have been made to this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton Moamed

betsy.mcdaniel@pacelabs.com

(770)734-4200

Project Manager

**Enclosures** 

cc: Whitney Law, Geosyntec Consultants
Noelia Muskus, Geosyntec Consultants
Rebecca Thornton, Pace Analytical Atlanta





#### **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

**Atlanta Certification IDs** 

110 Technology Parkway Peachtree Corners, GA 30092

Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001

Virginia Certification #: 460204

**Asheville Certification IDs** 

2225 Riverside Drive, Asheville, NC 28804 Florida/NELAP Certification #: E87648 Massachusetts Certification #: M-NC030

North Carolina Drinking Water Certification #: 37712

North Carolina Wastewater Certification #: 40 South Carolina Certification #: 99030001 Virginia/VELAP Certification #: 460222





# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2617064001	BGWC-32	Water	04/05/19 09:36	04/05/19 12:42



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2617064001	BGWC-32	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA



Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

Date: 05/07/2019 08:58 AM

Sample: BGWC-32	Lab ID:	2617064001	Collecte	ed: 04/05/19	9 09:36	Received: 04/	05/19 12:42 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00093J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 22:28	7440-38-2	
Barium	0.085	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 22:28	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 22:28	7440-41-7	
Boron	4.6J	mg/L	5.0	0.13	50	04/09/19 20:29	04/11/19 17:59	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 22:28	7440-43-9	
Calcium	265	mg/L	25.0	1.0	50	04/09/19 20:29	04/11/19 17:59	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 22:28	7440-47-3	
Cobalt	0.011	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 22:28	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 22:28	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 22:28	7439-93-2	
Molybdenum	0.0035J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 22:28	7439-98-7	
Selenium	0.00015J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 22:28	7782-49-2	
Thallium	0.00046J	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 22:28	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:01	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	1160	mg/L	25.0	10.0	1		04/11/19 20:53		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	270	mg/L	12.5	1.2	50		04/09/19 11:11	16887-00-6	
Fluoride	0.66	mg/L	0.30	0.029	1		04/09/19 09:27	16984-48-8	
Sulfate	312	mg/L	50.0	0.85	50			14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

Date: 05/07/2019 08:58 AM

QC Batch: 468368 Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury

Associated Lab Samples: 2617064001

METHOD BLANK: 2544203 Matrix: Water

Associated Lab Samples: 2617064001

Blank Reporting
Parameter Units Result Limit MDL Analyzed Qualifiers

Mercury mg/L ND 0.00020 0.00010 04/11/19 17:59

LABORATORY CONTROL SAMPLE: 2544204

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury mg/L 0.0025 0.0023 92 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2544205 2544206

MS MSD

MSD 92421822002 Spike Spike MS MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual 0.0024 0.0023 2 25 Mercury mg/L

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

Date: 05/07/2019 08:58 AM

QC Batch: 468329 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET

Associated Lab Samples: 2617064001

METHOD BLANK: 2544088 Matrix: Water

Associated Lab Samples: 2617064001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	 mg/L	0.000062J	0.0050	0.000060	04/10/19 19:29	· <del></del>
Barium	mg/L	ND	0.010	0.000060	04/10/19 19:29	
Beryllium	mg/L	ND	0.0030	0.000050	04/10/19 19:29	
Boron	mg/L	ND	0.10	0.0026	04/10/19 19:29	
Cadmium	mg/L	ND	0.0010	0.000070	04/10/19 19:29	
Calcium	mg/L	ND	0.50	0.021	04/10/19 19:29	
Chromium	mg/L	ND	0.010	0.00042	04/10/19 19:29	
Cobalt	mg/L	ND	0.010	0.000050	04/10/19 19:29	
Lead	mg/L	ND	0.0050	0.000050	04/10/19 19:29	BC
Lithium	mg/L	ND	0.050	0.00042	04/10/19 19:29	
Molybdenum	mg/L	ND	0.010	0.00010	04/10/19 19:29	
Selenium	mg/L	ND	0.010	0.000080	04/10/19 19:29	
Thallium	mg/L	ND	0.0010	0.000060	04/10/19 19:29	

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
senic	mg/L	0.01	0.010	103	80-120	
rium	mg/L	0.05	0.050	99	80-120	
ryllium	mg/L	0.01	0.0095	95	80-120	
on	mg/L	0.05	0.049J	98	80-120	
dmium	mg/L	0.01	0.010	102	80-120	
cium	mg/L	0.62	0.64	102	80-120	
omium	mg/L	0.05	0.050	101	80-120	
alt	mg/L	0.01	0.010	101	80-120	
I	mg/L	0.05	0.051	101	80-120 B	C
um	mg/L	0.05	0.052	104	80-120	
ybdenum	mg/L	0.05	0.052	103	80-120	
enium	mg/L	0.05	0.051	102	80-120	
ıllium	mg/L	0.01	0.010	101	80-120	

MATRIX SPIKE & MATRIX S	SPIKE DUPL	ICATE: 2544	090		2544091							
Parameter	Units	2617082009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	0.00012J	0.01	0.01	0.0092	0.0091	91	90	75-125	1	20	
Barium	mg/L	0.025	0.05	0.05	0.068	0.067	87	85	75-125	2	20	
Beryllium	mg/L	ND	0.01	0.01	0.0081	0.0080	80	79	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

Date: 05/07/2019 08:58 AM

MATRIX SPIKE & MATRIX	SPIKE DUPL	ICATE: 2544	090		2544091							
Parameter	Units	2617082009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	mg/L	0.49J	0.05	0.05	0.56	0.58	137	180	75-125	4	20	M1
Cadmium	mg/L	ND	0.01	0.01	0.0091	0.0091	91	90	75-125	0	20	
Calcium	mg/L	55.8	0.62	0.62	54.5	53.7	-203	-330	75-125	1	20	M6
Chromium	mg/L	ND	0.05	0.05	0.045	0.044	89	88	75-125	1	20	
Cobalt	mg/L	0.00010J	0.01	0.01	0.0089J	0.0088J	88	87	75-125	1	20	
Lead	mg/L	ND	0.05	0.05	0.044	0.045	88	90	75-125	2	20	
Lithium	mg/L	ND	0.05	0.05	0.044J	0.044J	89	87	75-125	2	20	
Molybdenum	mg/L	ND	0.05	0.05	0.046	0.046	92	93	75-125	1	20	
Selenium	mg/L	0.00091J	0.05	0.05	0.046	0.045	90	88	75-125	2	20	
Thallium	mg/L	ND	0.01	0.01	0.0088	0.0090	88	90	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

QC Batch: 26252 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 2617064001

LABORATORY CONTROL SAMPLE: 118510

Parameter Units Spike LCS LCS % Rec
Conc. Result % Rec Limits Qualifiers

Total Dissolved Solids mg/L 400 408 102 84-108

SAMPLE DUPLICATE: 118512

Date: 05/07/2019 08:58 AM

2617150003 Dup Max RPD RPD Parameter Units Result Result Qualifiers **Total Dissolved Solids** 2310 2380 3 10 mg/L

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



EPA 300.0

300.0 IC Anions

Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

Date: 05/07/2019 08:58 AM

QC Batch: 25956 Analysis Method: QC Batch Method: EPA 300.0 Analysis Description:

Associated Lab Samples: 2617064001

METHOD BLANK: 117263 Matrix: Water

Associated Lab Samples: 2617064001

		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.066J	0.25	0.024	04/08/19 22:43	
Fluoride	mg/L	ND	0.30	0.029	04/08/19 22:43	
Sulfate	mg/L	0.045J	1.0	0.017	04/08/19 22:43	

LABORATORY CONTROL SAMPLE:	117264					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	10	9.8	98	90-110	
Fluoride	mg/L	10	9.7	97	90-110	
Sulfate	mg/L	10	9.7	97	90-110	

MATRIX SPIKE & MATRIX SI	PIKE DUPLI	CATE: 1172	65		117266							
			MS	MSD								
		2617035001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	4.3	10	10	14.3	14.4	100	101	90-110	1	15	
Fluoride	mg/L	ND	10	10	9.7	9.8	97	98	90-110	1	15	
Sulfate	mg/L	8.5	10	10	17.6	17.7	91	92	90-110	0	15	

MATRIX SPIKE SAMPLE:	117267						
Parameter	Units	2617035002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	4.2	10	13.9	96	90-110	_
Fluoride	mg/L	ND	10	9.3	93	90-110	
Sulfate	mg/L	2.1	10	11.2	91	90-110	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



#### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

PASI-A Pace Analytical Services - Asheville
PASI-GA Pace Analytical Services - Atlanta, GA

#### **ANALYTE QUALIFIERS**

Date: 05/07/2019 08:58 AM

BC The same analyte was detected in an associated blank at a concentration above 1/2 the reporting limit but below the laboratory reporting limit.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617064

Date: 05/07/2019 08:58 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2617064001	BGWC-32	EPA 3010A	468329	EPA 6020B	468391
2617064001	BGWC-32	EPA 7470A	468368	EPA 7470A	468610
2617064001	BGWC-32	SM 2540C	26252		
2617064001	BGWC-32	EPA 300.0	25956		



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

200000	Required Client Information:	5	1				Attootio	Attention:								Γ		1			١	
Company.	Georgia Power - Coal Combustion Residuals		Joju Abraham				Attention:															
Address:	2480 Maner Road	Copy To: Geo	Geosyntec				Compar	Company Name:	20								١	١	1			
- 1	Atlanta, GA 30339	Whitney Law					Address:	,,								1			Regi	Regulatory Agency	gency	
Email: jat	0.com	Purchase Order #:		SCS10348606			Pace Quote:	note:									١	١				١
Je.	Phone: (404)506-7239 Fax	Project Name:	Plant Bo	Plant Bowen Ash Pond			Pace Pr	Pace Project Manager.	nager.	pets	betsy.mcdaniel@pacelabs.com	aniela	pacel	abs.co	E.				Sta	State / Location	ation	
nested	Due Date:	Project #:					Pace Profile #:	ofile #:	315							1			İ	GA		
F						ŀ	ŀ					-	8	questec	Requested Analysis Filtered (Y/N)	SIS Filto	//J) peu	-	I			
Т	MATRIX	GODE	(AMO)			N		ď	Preservatives	itives		N/A										
	CAMDIFID	e valid codes	=GRAB C=			COLLECTION						180		(*ISLI*) VI. q						(N/A)		
	E 72	7 % 8 0 %	၅)	COLLECTED	CTED	. TA €	ЕВВ					_	ddy							əuine		
# M3TI	Character per box.  (A-Z, 0-9 /, -)  Sample Ids must be unique  Tissue	T G A G	SAMPLE TYPE	Date	Time	SAMPLE TEMP	# OF CONTAIN	HZSO4	нсі	Na2S203	Methanol	Analyse TDS, CI, F, Se	Metals 6020	Metals 6020/747 Radium 226, 2						Residual Chic		
1	BGWC-32	M	v	415119	0936		ے ہ	8	-			X	X	×								
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	ADDITIONAL COMMENTS	RELIN	QUISHED	RELINQUISHED BY ! AFFILIATION		DATE	TIME		00	ACCE	ACCEPTED BY I AFFILIATION	AFFILL	ATION	,		DATE	1	TIME		SAN	SAMPLE CONDITIONS	DITIONS
V Parar	App. IV Parameters: As, Ba, Be, Cd, Co, Cr, Hg , Li, Mo, Pb, Se, Tl Onlyl	Veronica Fay	Fa	(Kesolu	41 H	611 <i>51h</i>	124	77.	M	3	4	#	3	7	4	12	20	77	3	0	9	7
															-	-	+			+	+	
Pag	JO#: 2617064			SAMPLER	R NAME AND SIGNATURE	SIGNATI	RE										-			U		
e 13 of	e 13 of			PRIN	PRINT Name of SAMPLER:	MPLER:		roni	Veronica Fay	31		-	DATE	DATE Signed:					O UI dW	o baviace	N/)	aled (N/)
				5	STORY STORY	The Party of the P								-			(				_	,

# Pace Analytical

# Sample Condition Upon Recei

WO#: 2617064

	1 1	0.	
lient Name:	GHT	rawe	V

PM: BM Due Date: 04/12/19

CLIENT: GAPower-CCR

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Clien Tracking #:	t Commercial	Pace Other	Optional Proj. Due Date:	
Custody Seal on Cooler/Box Present:  yes	no Seals	intact: yes	Proj. Name:	
Packing Material: Bubble Wrap Bubble	0	Other		
Thermometer Used 081	Type of Ice: (Wet		Samples on ice, cooling process h  Date and Initials, of person e	
Cooler Temperature  Temp should be above freezing to 6°C	Biological Tissue	is Frozen: Yes No Comments:	contents: 4/5/(9)	24
Chain of Custody Present:	Yes ONO ON/A	1.		
Chain of Custody Filled Out:	Yes ONO ON/A	2.		
Chain of Custody Relinquished:	ØYes □No □N/A	3.		
Sampler Name & Signature on COC:	Yes ONO ON/A	4.		
Samples Arrived within Hold Time:	ØYes □No □N/A	5.		
Short Hold Time Analysis (<72hr):	□Yes □Nø □N/A	6.		
Rush Turn Around Time Requested:	□Yes PNo □N/A	7.		
Sufficient Volume:	₩Yes □No □N/A	8.		
Correct Containers Used:	Pres ONO ON/A	9.		
-Pace Containers Used:	DYES DNO DN/A			
Containers Intact:	□Yes □No □N/A	10.		
Filtered volume received for Dissolved tests	□Yes □No □N/A	11.		
Sample Labels match COC:	Tes ONO ON/A	12.		
-Includes date/time/ID/Analysis Matrix:	<i>W</i>			
All containers needing preservation have been checked.	□Yes □No □N/A	13.		
All containers needing preservation are found to be in compliance with EPA recommendation.	ŬYes □No □N/A			
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	□Yes ☑No	Initial when completed	Lot # of added preservative	
Samples checked for dechlorination:	□Yes □No ☑MA	14.		
Headspace in VOA Vials ( >6mm):	□Yes □No □N/A	15.		
Trip Blank Present:	□Yes □No ØN/A	16.		
Trip Blank Custody Seals Present	□Yes □No □N/A	1		
Pace Trip Blank Lot # (if purchased):				
Client Notification/ Resolution:			Field Data Required? Y	/ N
Person Contacted:	Date/	Time:		
Comments/ Resolution:		No.		
Project Manager Review:			Date:	

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)





April 29, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2617065

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta



(770)734-4200



CERTIFICATIONS

Project: Plant Bowen Ash Pond

Pace Project No.: 2617065

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

**Arkansas Certification** 

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Missouri Certification #: 235 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L





# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617065

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2617065001	BGWC-32	Water	04/05/19 09:36	04/05/19 12:42



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617065

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2617065001	BGWC-32	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



# **ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617065

Sample: BGWC-32 PWS:	<b>Lab ID: 26170650</b> Site ID:	O1 Collected: 04/05/19 09:36 Sample Type:	Received:	04/05/19 12:42	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		1.18 ± 0.450 (0.450) C:88% T:NA	pCi/L	04/17/19 08:36	13982-63-3	
Radium-228		1.02 ± 0.402 (0.629) C:86% T:88%	pCi/L	04/18/19 12:30	15262-20-1	
Total Radium	Total Radium Calculation	2.20 ± 0.852 (1.08)	pCi/L	04/22/19 11:17	7440-14-4	



# **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617065

QC Batch: 337917

Analysis Method:

EPA 9315

QC Batch Method: EPA 9315

Analysis Description:

9315 Total Radium

Associated Lab Samples: 2617065001

METHOD BLANK: 1644525

Matrix: Water

Associated Lab Samples: 2617065001

Parameter

Act ± Unc (MDC) Carr Trac

Units pCi/L Analyzed

Qualifiers

Radium-226

0.221 ± 0.211 (0.378) C:90% T:NA

04/17/19 08:36

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



# **QUALITY CONTROL - RADIOCHEMISTRY**

EPA 9320

Project: Plant Bowen Ash Pond

Pace Project No.: 2617065

QC Batch: 337911

QC Batch Method: EPA 9320 Analysis Description: 9320 Radium 228

Associated Lab Samples: 2617065001

METHOD BLANK: 1644521 Matrix: Water

Associated Lab Samples: 2617065001

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.526 ± 0.315 (0.569) C:87% T:76%
 pCi/L
 04/18/19 12:31

Analysis Method:

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



#### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617065

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 04/29/2019 03:31 PM

PASI-PA Pace Analytical Services - Greensburg



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617065

Date: 04/29/2019 03:31 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2617065001	BGWC-32	EPA 9315	337917		
2617065001	BGWC-32	EPA 9320	337911		
2617065001	BGWC-32	Total Radium Calculation	339290		

# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

SAMPLE ID   Substitution   Substit	Section A		Section B				S	Section C									L				2
Company   Comp	Required (	Client Information:	Required Projec	t Informati	on:		'n	voice Info	rmation:			1	1			г		Page:			4
COLUMN   C	Company.	Georgia Power - Coal Combustion Residuals		u Abraham			At	rention:								_					
State   Stat	Address	2480 Maner Road		osyntec			3 3	ompany Na	ame:							1		-			
Part   Part	1	Audina, GA 30559	Purchase Order		0348606		c a	Ce Oriote						1		L		Regul	atory Ag	ney	
100   100			Project Name:	Plant Bov	wen Ash Pond		Pa	ce Project	Manager		sv.mcd	aniel@	pacel	abs.cor	n,			Stat	a / Locat	no	District Section
Particle   Particle	Requested	Due Date:	Project #:				Pa	ice Profile	#: 316							L			GA		
Sample   Presentation   Presentati								$\ $	Ш	Ш			Rec	quested	Analysis F	iltered (	(N/A	П			
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PRINT Name of SAMPLER: Verbnica Fox DATE Signed: 4/5/119 FE	Pag	110# · 261 7065			SAMPLER	NAME AND SIG	RATIRE														
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#### WO#: 2617065 Sample Condition Upon Receipt Pace Analytical Client Name: (5 PM: BM Due Date: 05/03/19 CLIENT: GAPower-CCR Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace Other Proj. Due Date: Tracking #: Proj. Name: Seals intact: ves no Custody Seal on Cooler/Box Present: yes Bubble Bags Packing Material: Bubble Wrap None Other Thermometer Used Type of Ice: (Wet Samples on ice, cooling process has begun Blue None Date and Initials, of person examining Biological Tissue is Frozen: Yes No Cooler Temperature contents: Temp should be above freezing to 6°C Comments: Tyes DNo Chain of Custody Present: □N/A 1 Yes DNo □N/A 2. Chain of Custody Filled Out: □Yes □No □N/A 3 Chain of Custody Relinquished: Sampler Name & Signature on COC: Yes DNo □N/A 4 BYes □No □N/A 5 Samples Arrived within Hold Time: ☐Yes ☐Nø ☐N/A Short Hold Time Analysis (<72hr): □Yes ☑No □N/A 7 Rush Turn Around Time Requested: TYes DNo Sufficient Volume: □N/A ☑Yes □No Correct Containers Used: □N/A 9. -Pace Containers Used: DYES' DNo □N/A □xes □No Containers Intact: □N/A 10 □Yes □No □N/A Filtered volume received for Dissolved tests 11 Sample Labels match COC: Tes INO IN/A 12 -Includes date/time/ID/Analysis All containers needing preservation have been checked. □Yes □No □N/A 13. All containers needing preservation are found to be in ☐Yes ☐No □N/A compliance with EPA recommendation. Lot # of added Initial when ☐Yes ☑No exceptions: VOA, coliform, TOC, O&G, WI-DRO (water) completed preservative □Yes □No Samples checked for dechlorination: DNIA 14. □Yes □No DN/A Headspace in VOA Vials ( >6mm): 15. Trip Blank Present: □Yes □No DN/A 16. Trip Blank Custody Seals Present ☐Yes ☐No EIN/A Pace Trip Blank Lot # (if purchased): Client Notification/ Resolution: Field Data Required? Person Contacted: Comments/ Resolution:

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Project Manager Review:

Date:





May 03, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This revised report replaces the one issued on 4/13/2019. The report has been revised to correct metals units and target list per consultant request. No other changes have been made to this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton Moamed

betsy.mcdaniel@pacelabs.com

(770)734-4200

Project Manager

**Enclosures** 

cc: Whitney Law, Geosyntec Consultants
Noelia Muskus, Geosyntec Consultants
Rebecca Thornton, Pace Analytical Atlanta





# **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

**Atlanta Certification IDs** 

110 Technology Parkway Peachtree Corners, GA 30092

Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812

Georgia DW Microbiology Certification #: 812

North Carolina Certification #: 381

South Carolina Certification #: 98011001

Virginia Certification #: 460204

**Asheville Certification IDs** 

2225 Riverside Drive, Asheville, NC 28804 Florida/NELAP Certification #: E87648 Massachusetts Certification #: M-NC030

North Carolina Drinking Water Certification #: 37712

North Carolina Wastewater Certification #: 40 South Carolina Certification #: 99030001 Virginia/VELAP Certification #: 460222



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2617076001	BGWA-33	Water	04/03/19 10:28	04/05/19 11:20
2617076002	BGWC-19	Water	04/03/19 11:55	04/05/19 11:20
2617076003	BGWC-20	Water	04/03/19 10:30	04/05/19 11:20
2617076004	BGWC-21	Water	04/03/19 14:05	04/05/19 11:20
2617076005	BGWC-22	Water	04/03/19 11:18	04/05/19 11:20
2617076006	BGWC-23	Water	04/03/19 09:38	04/05/19 11:20
2617076007	BGWC-24	Water	04/03/19 16:36	04/05/19 11:20
2617076008	FBL040319	Water	04/03/19 12:46	04/05/19 11:20
2617076009	EQBL040319	Water	04/03/19 12:50	04/05/19 11:20



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2617076001	BGWA-33	EPA 6020B	JMW1	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617076002	BGWC-19	EPA 6020B	JMW1	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617076003	BGWC-20	EPA 6020B	JMW1	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617076004	BGWC-21	EPA 6020B	JMW1	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617076005	BGWC-22	EPA 6020B	JMW1	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617076006	BGWC-23	EPA 6020B	JMW1	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617076007	BGWC-24	EPA 6020B	JMW1, KQ	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617076008	FBL040319	EPA 6020B	JMW1	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617076009	EQBL040319	EPA 6020B	JMW1	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

Sample: BGWA-33	Lab ID:	2617076001	Collecte	ed: 04/03/19	10:28	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.0020J	mg/L	0.0050	0.000060	1	04/09/19 10:55	04/10/19 02:14	7440-38-2	
Barium	0.025	mg/L	0.010	0.000060	1	04/09/19 10:55	04/10/19 02:14	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 10:55	04/10/19 02:14	7440-41-7	
Boron	0.66	mg/L	0.10	0.0026	1	04/09/19 10:55	04/10/19 02:14	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 10:55	04/10/19 02:14	7440-43-9	
Calcium	44.9	mg/L	0.50	0.021	1	04/09/19 10:55	04/10/19 02:14	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 10:55	04/10/19 02:14	7440-47-3	
Cobalt	0.00011J	mg/L	0.010	0.000050	1	04/09/19 10:55	04/10/19 02:14	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 10:55	04/10/19 02:14	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 10:55	04/10/19 02:14	7439-93-2	
Molybdenum	0.034	mg/L	0.010	0.00010	1	04/09/19 10:55	04/10/19 02:14	7439-98-7	
Selenium	0.00013J	mg/L	0.010	0.000080	1	04/09/19 10:55	04/10/19 02:14	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 10:55	04/10/19 02:14	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prep	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:22	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	235	mg/L	25.0	10.0	1		04/10/19 16:34		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	5.2	mg/L	0.25	0.024	1		04/10/19 02:15	16887-00-6	
Fluoride	0.085J	mg/L	0.30	0.029	1		04/10/19 02:15	16984-48-8	
Sulfate	26.2	mg/L	1.0	0.017	1		04/10/19 02:15	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

Sample: BGWC-19	Lab ID:	2617076002	Collecte	ed: 04/03/19	9 11:55	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	thod: EF	PA 3010A			
Arsenic	0.00017J	mg/L	0.0050	0.000060	1	04/09/19 10:55	04/10/19 02:18	7440-38-2	
Barium	0.033	mg/L	0.010	0.000060	1	04/09/19 10:55	04/10/19 02:18	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 10:55	04/10/19 02:18	7440-41-7	
Boron	0.51	mg/L	0.10	0.0026	1	04/09/19 10:55	04/10/19 02:18	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 10:55	04/10/19 02:18	7440-43-9	
Calcium	51.3	mg/L	0.50	0.021	1	04/09/19 10:55	04/10/19 02:18	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 10:55	04/10/19 02:18	7440-47-3	
Cobalt	0.000072J	mg/L	0.010	0.000050	1	04/09/19 10:55	04/10/19 02:18	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 10:55	04/10/19 02:18	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 10:55	04/10/19 02:18	7439-93-2	
Molybdenum	0.00023J	mg/L	0.010	0.00010	1	04/09/19 10:55	04/10/19 02:18	7439-98-7	
Selenium	0.00058J	mg/L	0.010	0.000080	1	04/09/19 10:55	04/10/19 02:18	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 10:55	04/10/19 02:18	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prep	paration Met	thod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:25	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	259	mg/L	25.0	10.0	1		04/10/19 16:34		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	9.7	mg/L	0.25	0.024	1		04/10/19 02:39	16887-00-6	
Fluoride	0.051J	mg/L	0.30	0.029	1		04/10/19 02:39	16984-48-8	
Sulfate	90.6	mg/L	10.0	0.17	10		04/10/19 09:31	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

Sample: BGWC-20	Lab ID:	2617076003	Collecte	ed: 04/03/19	10:30	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00027J	mg/L	0.0050	0.000060	1	04/09/19 10:55	04/10/19 02:21	7440-38-2	
Barium	0.029	mg/L	0.010	0.000060	1	04/09/19 10:55	04/10/19 02:21	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 10:55	04/10/19 02:21	7440-41-7	
Boron	2.6	mg/L	0.10	0.0026	1	04/09/19 10:55	04/10/19 02:21	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 10:55	04/10/19 02:21	7440-43-9	
Calcium	220	mg/L	0.50	0.021	1	04/09/19 10:55	04/10/19 02:21	7440-70-2	
Chromium	0.00088J	mg/L	0.010	0.00042	1	04/09/19 10:55	04/10/19 02:21	7440-47-3	
Cobalt	0.00024J	mg/L	0.010	0.000050	1	04/09/19 10:55	04/10/19 02:21	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 10:55	04/10/19 02:21	7439-92-1	
Lithium	0.012J	mg/L	0.050	0.00042	1	04/09/19 10:55	04/10/19 02:21	7439-93-2	
Molybdenum	0.012	mg/L	0.010	0.00010	1	04/09/19 10:55	04/10/19 02:21	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 10:55	04/10/19 02:21	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 10:55	04/10/19 02:21	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:27	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	2540C						
Total Dissolved Solids	1090	mg/L	25.0	10.0	1		04/10/19 16:34		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	144	mg/L	12.5	1.2	50		04/10/19 09:54	16887-00-6	
Fluoride	0.072J	mg/L	0.30	0.029	1		04/10/19 03:02	16984-48-8	
Sulfate	593	mg/L	50.0	0.85	50		04/10/19 09:54	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

Sample: BGWC-21	Lab ID:	2617076004	Collecte	ed: 04/03/1	9 14:05	Received: 04/05/19 11:20 Matrix: Water			
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Me	thod: EF	PA 3010A			
Arsenic	0.00038J	mg/L	0.0050	0.000060	1	04/09/19 10:55	04/10/19 02:35	7440-38-2	
Barium	0.033	mg/L	0.010	0.000060	1	04/09/19 10:55	04/10/19 02:35	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 10:55	04/10/19 02:35	7440-41-7	
Boron	0.12	mg/L	0.10	0.0026	1	04/09/19 10:55	04/10/19 02:35	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 10:55	04/10/19 02:35	7440-43-9	
Calcium	43.4	mg/L	0.50	0.021	1	04/09/19 10:55	04/10/19 02:35	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 10:55	04/10/19 02:35	7440-47-3	
Cobalt	0.00064J	mg/L	0.010	0.000050	1	04/09/19 10:55	04/10/19 02:35	7440-48-4	
Lead	0.000068J	mg/L	0.0050	0.000050	1	04/09/19 10:55	04/10/19 02:35	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 10:55	04/10/19 02:35	7439-93-2	
Molybdenum	0.0019J	mg/L	0.010	0.00010	1	04/09/19 10:55	04/10/19 02:35	7439-98-7	
Selenium	0.00012J	mg/L	0.010	0.000080	1	04/09/19 10:55	04/10/19 02:35	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 10:55	04/10/19 02:35	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre <sub>l</sub>	paration Me	thod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:29	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	244	mg/L	25.0	10.0	1		04/10/19 16:35		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	5.0	mg/L	0.25	0.024	1		04/10/19 03:25	16887-00-6	
Fluoride	0.032J	mg/L	0.30	0.029	1		04/10/19 03:25		
Sulfate	61.9	mg/L	5.0	0.085	5		04/10/19 11:49		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

Sample: BGWC-22	Lab ID:	2617076005	Collecte	ed: 04/03/19	11:18	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.0021J	mg/L	0.0050	0.000060	1	04/09/19 10:55	04/10/19 02:38	7440-38-2	
Barium	0.082	mg/L	0.010	0.000060	1	04/09/19 10:55	04/10/19 02:38	7440-39-3	
Beryllium	0.000067J	mg/L	0.0030	0.000050	1	04/09/19 10:55	04/10/19 02:38	7440-41-7	
Boron	7.9	mg/L	0.10	0.0026	1	04/09/19 10:55	04/10/19 02:38	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 10:55	04/10/19 02:38	7440-43-9	
Calcium	458	mg/L	0.50	0.021	1	04/09/19 10:55	04/10/19 02:38	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 10:55	04/10/19 02:38	7440-47-3	
Cobalt	0.019	mg/L	0.010	0.000050	1	04/09/19 10:55	04/10/19 02:38	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 10:55	04/10/19 02:38	7439-92-1	
Lithium	0.024J	mg/L	0.050	0.00042	1	04/09/19 10:55	04/10/19 02:38	7439-93-2	
Molybdenum	0.039	mg/L	0.010	0.00010	1	04/09/19 10:55	04/10/19 02:38	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 10:55	04/10/19 02:38	7782-49-2	
Thallium	0.00070J	mg/L	0.0010	0.000060	1	04/09/19 10:55	04/10/19 02:38	7440-28-0	
7470 Mercury	Analytical I	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:32	7439-97-6	
2540C Total Dissolved Solids	Analytical I	Method: SM 2	540C						
Total Dissolved Solids	2180	mg/L	25.0	10.0	1		04/10/19 16:35		
300.0 IC Anions 28 Days	Analytical I	Method: EPA	300.0						
Chloride	856	mg/L	12.5	1.2	50		04/10/19 12:11	16887-00-6	
Fluoride	0.23J	mg/L	0.30	0.029	1		04/10/19 03:48	16984-48-8	
Sulfate	720	mg/L	50.0	0.85	50		04/10/19 12:11		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

Sample: BGWC-23	Lab ID:	2617076006	Collecte	ed: 04/03/19	9 09:38	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00093J	mg/L	0.0050	0.000060	1	04/09/19 10:55	04/10/19 02:42	7440-38-2	
Barium	0.087	mg/L	0.010	0.000060	1	04/09/19 10:55	04/10/19 02:42	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 10:55	04/10/19 02:42	7440-41-7	
Boron	6.5	mg/L	0.10	0.0026	1	04/09/19 10:55	04/10/19 02:42	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 10:55	04/10/19 02:42	7440-43-9	
Calcium	396	mg/L	0.50	0.021	1	04/09/19 10:55	04/10/19 02:42	7440-70-2	
Chromium	0.00057J	mg/L	0.010	0.00042	1	04/09/19 10:55	04/10/19 02:42	7440-47-3	
Cobalt	0.00058J	mg/L	0.010	0.000050	1	04/09/19 10:55	04/10/19 02:42	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 10:55	04/10/19 02:42	7439-92-1	
Lithium	0.013J	mg/L	0.050	0.00042	1	04/09/19 10:55	04/10/19 02:42	7439-93-2	
Molybdenum	0.012	mg/L	0.010	0.00010	1	04/09/19 10:55	04/10/19 02:42	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 10:55	04/10/19 02:42	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 10:55	04/10/19 02:42	7440-28-0	
7470 Mercury	Analytical I	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:34	7439-97-6	
2540C Total Dissolved Solids	Analytical I	Method: SM 2	540C						
Total Dissolved Solids	1990	mg/L	25.0	10.0	1		04/10/19 16:35		
300.0 IC Anions 28 Days	Analytical I	Method: EPA	300.0						
Chloride	679	mg/L	12.5	1.2	50		04/10/19 12:34	16887-00-6	
Fluoride	0.10J	mg/L	0.30	0.029	1		04/10/19 04:10	16984-48-8	
Sulfate	603	mg/L	50.0	0.85	50		04/10/19 12:34	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

Sample: BGWC-24	Lab ID:	2617076007	Collecte	ed: 04/03/19	9 16:36	Received: 04/05/19 11:20 Matrix: Water			
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.0019J	mg/L	0.0050	0.000060	1	04/09/19 10:55	04/10/19 02:45	7440-38-2	
Barium	0.095	mg/L	0.010	0.000060	1	04/09/19 10:55	04/10/19 02:45	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 10:55	04/10/19 02:45	7440-41-7	
Boron	23.3	mg/L	0.10	0.0026	1	04/09/19 10:55	04/10/19 02:45	7440-42-8	
Cadmium	0.0053	mg/L	0.0010	0.000070	1	04/09/19 10:55	04/10/19 02:45	7440-43-9	
Calcium	945	mg/L	50.0	2.1	100	05/01/19 17:00	05/03/19 12:09	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 10:55	04/10/19 02:45	7440-47-3	
Cobalt	0.0048J	mg/L	0.010	0.000050	1	04/09/19 10:55	04/10/19 02:45	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 10:55	04/10/19 02:45	7439-92-1	
Lithium	0.0048J	mg/L	0.050	0.00042	1	04/09/19 10:55	04/10/19 02:45	7439-93-2	
Molybdenum	0.00095J	mg/L	0.010	0.00010	1	04/09/19 10:55	04/10/19 02:45	7439-98-7	
Selenium	0.0038J	mg/L	0.010	0.000080	1	04/09/19 10:55	04/10/19 02:45	7782-49-2	
Thallium	0.00064J	mg/L	0.0010	0.000060	1	04/09/19 10:55	04/10/19 02:45	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	0.0013	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:36	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	2540C						
Total Dissolved Solids	13.0J	mg/L	25.0	10.0	1		04/10/19 16:35		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	1890	mg/L	12.5	1.2	50		04/12/19 15:33	16887-00-6	
Fluoride	3.0	mg/L	0.30	0.029	1		04/10/19 04:34	16984-48-8	
Sulfate	648	mg/L	50.0	0.85	50		04/12/19 15:33		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

Sample: FBL040319	Lab ID:	2617076008	Collecte	ed: 04/03/19	9 12:46	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	thod: Ef	PA 3010A			
Arsenic	ND	mg/L	0.0050	0.000060	1	04/09/19 10:55	04/10/19 02:49	7440-38-2	
Barium	0.000086J	mg/L	0.010	0.000060	1	04/09/19 10:55	04/10/19 02:49	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 10:55	04/10/19 02:49	7440-41-7	
Boron	0.93	mg/L	0.10	0.0026	1	04/09/19 10:55	04/10/19 02:49	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 10:55	04/10/19 02:49	7440-43-9	
Calcium	0.090J	mg/L	0.50	0.021	1	04/09/19 10:55	04/10/19 02:49	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 10:55	04/10/19 02:49	7440-47-3	
Cobalt	ND	mg/L	0.010	0.000050	1	04/09/19 10:55	04/10/19 02:49	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 10:55	04/10/19 02:49	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 10:55	04/10/19 02:49	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00010	1	04/09/19 10:55	04/10/19 02:49	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 10:55	04/10/19 02:49	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 10:55	04/10/19 02:49	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	thod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:39	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM	2540C						
Total Dissolved Solids	12.0J	mg/L	25.0	10.0	1		04/10/19 16:35		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	0.31	mg/L	0.25	0.024	1		04/10/19 06:28	16887-00-6	В
Fluoride	ND	mg/L	0.30	0.029	1		04/10/19 06:28	16984-48-8	
Sulfate	ND	mg/L	1.0	0.017	1		04/10/19 06:28		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

Sample: EQBL040319	Lab ID:	2617076009	Collecte	ed: 04/03/19	12:50	Received: 04/	05/19 11:20 Ma	atrix: Water	
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	ND	mg/L	0.0050	0.000060	1	04/09/19 10:55	04/10/19 02:52	7440-38-2	
Barium	ND	mg/L	0.010	0.000060	1	04/09/19 10:55	04/10/19 02:52	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 10:55	04/10/19 02:52	7440-41-7	
Boron	0.32	mg/L	0.10	0.0026	1	04/09/19 10:55	04/10/19 02:52	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 10:55	04/10/19 02:52	7440-43-9	
Calcium	0.026J	mg/L	0.50	0.021	1	04/09/19 10:55	04/10/19 02:52	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 10:55	04/10/19 02:52	7440-47-3	
Cobalt	ND	mg/L	0.010	0.000050	1	04/09/19 10:55	04/10/19 02:52	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 10:55	04/10/19 02:52	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 10:55	04/10/19 02:52	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00010	1	04/09/19 10:55	04/10/19 02:52	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 10:55	04/10/19 02:52	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 10:55	04/10/19 02:52	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:41	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	45.0	mg/L	25.0	10.0	1		04/10/19 16:35		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	0.32	mg/L	0.25	0.024	1		04/10/19 06:51	16887-00-6	В
Fluoride	ND	mg/L	0.30	0.029	1		04/10/19 06:51	16984-48-8	
Sulfate	ND	mg/L	1.0	0.017	1		04/10/19 06:51		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

QC Batch: 468366 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury

Associated Lab Samples: 2617076001, 2617076002, 2617076003, 2617076004, 2617076005, 2617076006, 2617076007, 2617076008,

2617076009

METHOD BLANK: 2544199 Matrix: Water

Associated Lab Samples: 2617076001, 2617076002, 2617076003, 2617076004, 2617076005, 2617076006, 2617076007, 2617076008,

2617076009

Blank Reporting Parameter Units MDL Qualifiers Result Limit Analyzed Mercury mg/L ND 0.00020 0.00010 04/11/19 19:03 LABORATORY CONTROL SAMPLE: 2544200 LCS LCS Spike % Rec Parameter Units Conc. Result % Rec Limits Qualifiers 0.0026 106 80-120 Mercury mg/L 0.0025 MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2544201 2544202 MS MSD 2617069003 Spike Spike MS MSD MS MSD % Rec Max Result RPD RPD Parameter Units Result Conc. Conc. % Rec % Rec Limits Qual Result Mercury mg/L 0.0019 0.0021 10 25

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

QC Batch: 468126 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET

Associated Lab Samples: 2617076001, 2617076002, 2617076003, 2617076004, 2617076005, 2617076006, 2617076007, 2617076008,

2617076009

METHOD BLANK: 2543175 Matrix: Water

Associated Lab Samples: 2617076001, 2617076002, 2617076003, 2617076004, 2617076005, 2617076006, 2617076007, 2617076008,

2617076009

		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	ND ND	0.0050	0.000060	04/11/19 00:58	
Barium	mg/L	ND	0.010	0.000060	04/11/19 00:58	
Beryllium	mg/L	ND	0.0030	0.000050	04/10/19 00:56	
Boron	mg/L	ND	0.10	0.0026	04/11/19 00:58	
Cadmium	mg/L	ND	0.0010	0.000070	04/11/19 00:58	
Calcium	mg/L	ND	0.50	0.021	04/11/19 00:58	
Chromium	mg/L	ND	0.010	0.00042	04/11/19 00:58	
Cobalt	mg/L	ND	0.010	0.000050	04/11/19 00:58	
Lead	mg/L	ND	0.0050	0.000050	04/11/19 00:58	
Lithium	mg/L	ND	0.050	0.00042	04/11/19 00:58	
Molybdenum	mg/L	ND	0.010	0.00010	04/11/19 00:58	
Selenium	mg/L	ND	0.010	0.000080	04/11/19 00:58	
Thallium	mg/L	ND	0.0010	0.000060	04/11/19 00:58	

LABORATORY CONTROL SAMPLE:	2543176					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Arsenic	mg/L	0.01	0.0099	99	80-120	_
Barium	mg/L	0.05	0.049	98	80-120	
Beryllium	mg/L	0.01	0.0095	95	80-120	
Boron	mg/L	0.05	0.047J	94	80-120	
Cadmium	mg/L	0.01	0.010	101	80-120	
Calcium	mg/L	0.62	0.63	101	80-120	
Chromium	mg/L	0.05	0.050	99	80-120	
Cobalt	mg/L	0.01	0.010J	100	80-120	
Lead	mg/L	0.05	0.050	100	80-120	
Lithium	mg/L	0.05	0.050J	100	80-120	
Molybdenum	mg/L	0.05	0.051	102	80-120	
Selenium	mg/L	0.05	0.050	99	80-120	
Thallium	mg/L	0.01	0.0099	99	80-120	

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	CATE: 25431	77		2543178							
		2617072001	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Arsenic	mg/L	0.00017J	0.01	0.01	0.010	0.010	102	99	75-125	3	20	
Barium	ma/L	0.018	0.05	0.05	0.069	0.068	101	99	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

MATRIX SPIKE & MATRIX SF	PIKE DUPLIC	ATE: 25431	77		2543178							
Parameter	Units	2617072001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec	RPD	Max RPD	Qual
Beryllium	mg/L	ND	0.01	0.01	0.0088	0.0084	87	84	75-125	4	20	
Boron	mg/L	2.3	0.05	0.05	2.4	2.4	205	248	75-125	1	20	M6
Cadmium	mg/L	0.0018	0.01	0.01	0.012	0.011	97	96	75-125	1	20	
Calcium	mg/L	214	0.62	0.62	218	216	575	271	75-125	1	20	M6
Chromium	mg/L	ND	0.05	0.05	0.050	0.049	99	98	75-125	1	20	
Cobalt	mg/L	0.035	0.01	0.01	0.044	0.044	97	94	75-125	1	20	
Lead	mg/L	0.000072J	0.05	0.05	0.052	0.051	103	102	75-125	1	20	
Lithium	mg/L	0.00090J	0.05	0.05	0.046J	0.045J	90	88	75-125	2	20	
Molybdenum	mg/L	ND	0.05	0.05	0.052	0.052	104	103	75-125	1	20	
Selenium	mg/L	0.00021J	0.05	0.05	0.050	0.049	99	97	75-125	2	20	
Thallium	mg/L	ND	0.01	0.01	0.010	0.010	104	102	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

QC Batch: 473123 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET

Associated Lab Samples: 2617076007

METHOD BLANK: 2566181 Matrix: Water

Associated Lab Samples: 2617076007

ParameterUnitsBlank Reporting ResultReporting LimitMDLAnalyzedQualifiersCalciummg/LND0.200.02105/03/19 12:02

LABORATORY CONTROL SAMPLE: 2566182

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Calcium mg/L 0.62 0.64 103 80-120

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

LABORATORY CONTROL SAMPLE:

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

QC Batch: 26131 Analysis Method: SM 2540C

117963

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 2617076001, 2617076002, 2617076003, 2617076004, 2617076005, 2617076006, 2617076007, 2617076008,

2617076009

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers 84-108 **Total Dissolved Solids** mg/L 400 408 102 SAMPLE DUPLICATE: 117964 2617035001 Dup Max

ParameterUnitsResultResultRPDRPDQualifiersTotal Dissolved Solidsmg/L111103710

SAMPLE DUPLICATE: 117965 2617076005 Dup Max Parameter Units Result Result **RPD RPD** Qualifiers 2180 **Total Dissolved Solids** 2110 3 10 mg/L

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

QC Batch: 26061 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 2617076001, 2617076002, 2617076003, 2617076004, 2617076005, 2617076006, 2617076007, 2617076008,

2617076009

METHOD BLANK: 117670 Matrix: Water

Associated Lab Samples: 2617076001, 2617076002, 2617076003, 2617076004, 2617076005, 2617076006, 2617076007, 2617076008,

2617076009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.31	0.25	0.024	04/09/19 19:01	
Fluoride	mg/L	ND	0.30	0.029	04/09/19 19:01	
Sulfate	mg/L	ND	1.0	0.017	04/09/19 19:01	

LABORATORY CONTROL SAMPLE:	117671					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	10	10.1	101	90-110	
Fluoride	mg/L	10	9.4	94	90-110	
Sulfate	mg/L	10	10.8	108	90-110	

MATRIX SPIKE & MATRIX SPIR	(E DUPLIC	CATE: 117672	2		117673							
			MS	MSD								
		2617069001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	6.9	10	10	16.0	16.1	91	92	90-110	1	15	
Fluoride	mg/L	0.042J	10	10	9.0	9.1	89	91	90-110	2	15	M1
Sulfate	mg/L	358	10	10	224	224	-1340	-1330	90-110	0	15	M1

MATRIX SPIKE SAMPLE:	117674						
		2617069002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	7.2	10	16.3	91	90-110	
Fluoride	mg/L	0.045J	10	9.3	92	90-110	
Sulfate	mg/L	369	10	226	-1430	90-110 N	<i>I</i> 11

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



## **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## **LABORATORIES**

PASI-A Pace Analytical Services - Asheville
PASI-GA Pace Analytical Services - Atlanta, GA

## **ANALYTE QUALIFIERS**

Date: 05/03/2019 03:17 PM

B Analyte was detected in the associated method blank.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617076

Date: 05/03/2019 03:17 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2617076001	BGWA-33	EPA 3010A	468126	EPA 6020B	468248
2617076002	BGWC-19	EPA 3010A	468126	EPA 6020B	468248
2617076003	BGWC-20	EPA 3010A	468126	EPA 6020B	468248
2617076004	BGWC-21	EPA 3010A	468126	EPA 6020B	468248
2617076005	BGWC-22	EPA 3010A	468126	EPA 6020B	468248
2617076006	BGWC-23	EPA 3010A	468126	EPA 6020B	468248
2617076007	BGWC-24	EPA 3010A	468126	EPA 6020B	468248
2617076007	BGWC-24	EPA 3010A	473123	EPA 6020B	473134
2617076008	FBL040319	EPA 3010A	468126	EPA 6020B	468248
2617076009	EQBL040319	EPA 3010A	468126	EPA 6020B	468248
2617076001	BGWA-33	EPA 7470A	468366	EPA 7470A	468612
2617076002	BGWC-19	EPA 7470A	468366	EPA 7470A	468612
2617076003	BGWC-20	EPA 7470A	468366	EPA 7470A	468612
2617076004	BGWC-21	EPA 7470A	468366	EPA 7470A	468612
2617076005	BGWC-22	EPA 7470A	468366	EPA 7470A	468612
617076006	BGWC-23	EPA 7470A	468366	EPA 7470A	468612
2617076007	BGWC-24	EPA 7470A	468366	EPA 7470A	468612
2617076008	FBL040319	EPA 7470A	468366	EPA 7470A	468612
2617076009	EQBL040319	EPA 7470A	468366	EPA 7470A	468612
2617076001	BGWA-33	SM 2540C	26131		
2617076002	BGWC-19	SM 2540C	26131		
2617076003	BGWC-20	SM 2540C	26131		
2617076004	BGWC-21	SM 2540C	26131		
2617076005	BGWC-22	SM 2540C	26131		
2617076006	BGWC-23	SM 2540C	26131		
2617076007	BGWC-24	SM 2540C	26131		
2617076008	FBL040319	SM 2540C	26131		
2617076009	EQBL040319	SM 2540C	26131		
2617076001	BGWA-33	EPA 300.0	26061		
2617076002	BGWC-19	EPA 300.0	26061		
2617076003	BGWC-20	EPA 300.0	26061		
2617076004	BGWC-21	EPA 300.0	26061		
617076005	BGWC-22	EPA 300.0	26061		
2617076006	BGWC-23	EPA 300.0	26061		
2617076007	BGWC-24	EPA 300.0	26061		
2617076008	FBL040319	EPA 300.0	26061		
2617076009	EQBL040319	EPA 300.0	26061		



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Section A	Required Client Information: Company Geomie Power	ssa		Email: jabraham@southernco.com	نو	Requested Due Date:														1 75	9.777		12		App. IV Parameters: As, Ba, Bo, Cd, Co, Cr, Hg , Li, Ma, Pb, Se, Tl Onlyl				Page	e 22	of 23
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. Face Anal	rtical Client Name:	GCA	Powere	Project #	
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Custody Seal on C	cooler/Box Present:	no Seals	intact: yes	CLIENT: GAP	wer-CCR
Packing Material:	☐ Bubble Wrap ☐ Bubble Bag	None	Other		
Thermometer Use	в <u>83</u> ту	e of Ice: Wet	Blue None	Samples on ice, co	ling, process has begun
Cooler Temperatu	"	logical Tissue	is Frozen: Yes No	Date and Initia	s of person examining
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Sufficient Volume:	مين. المينان	es □No □N/A	8.		
Correct Containers	Used: -27	es □No □N/A	9.		
-Pace Container	s Used:	es □no □n/A			
Containers Intact:	<u> </u>	es □No □N/A	10.		
Filtered volume rec	eived for Dissolved tests	es □No -□N/A	11,		
Sample Labels mat	ch COC:	res 🗆 No 🗆 N/A	12.		
-includes date/ti	<u> </u>	$\omega$			
All containers needing	preservation have been checked.	res 🗆 No 🗆 N/A	13.		
	preservation are found to be in	 res □No □N/A			
compliance with EPA			Initial when	Lot # of added	
exceptions: VOA, colifo	m, TOC, O&G, WI-DRO (water)	es ₽No	completed	preservative	
Samples checked f	or dechlorination:	′es ⊡No DH7A	14.		
Headspace in VOA	Vials ( >6mm): □	res □No ØN/A	15.		
Trip Blank Present:		res □No -□N/A	16.		
Trip Blank Custody	Seals Present	res □No □MA			
Pace Trip Blank Lo	# (if purchased):				
Client Notification	Resolution:			Field Data Require	1? Y / N
Person Cont	acted:	Date/	Time:	:	
Comments/ Reso	lution:				
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Project Manage	r Review:			Date:	
	e is a discrepancy affecting North Caroli e out of hold, incorrect preservative, ou			rm will be sent to the Nor	th Carolina DEHNR

F-ALLC003rev.3, 11Septembar 2028 of 28





April 29, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta



(770)734-4200



## **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

**Arkansas Certification** 

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Missouri Certification #: 235 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457

New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2617077001	BGWA-33	Water	04/03/19 10:28	04/05/19 11:20
2617077002	BGWC-19	Water	04/03/19 11:55	04/05/19 11:20
2617077003	BGWC-20	Water	04/03/19 10:30	04/05/19 11:20
2617077004	BGWC-21	Water	04/03/19 14:05	04/05/19 11:20
2617077005	BGWC-22	Water	04/03/19 11:18	04/05/19 11:20
2617077006	BGWC-23	Water	04/03/19 09:38	04/05/19 11:20
2617077007	BGWC-24	Water	04/03/19 16:36	04/05/19 11:20
2617077008	FBL040319	Water	04/03/19 12:46	04/05/19 11:20
2617077009	EQBL040319	Water	04/03/19 12:50	04/05/19 11:20



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2617077001	BGWA-33	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617077002	BGWC-19	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617077003	BGWC-20	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617077004	BGWC-21	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
617077005	BGWC-22	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617077006	BGWC-23	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617077007	BGWC-24	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617077008	FBL040319	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
617077009	EQBL040319	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Sample: BGWA-33 PWS:	<b>Lab ID: 26170770</b> Site ID:	O1 Collected: 04/03/19 10:28 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.303 ± 0.314 (0.621) C:71% T:NA	pCi/L	04/17/19 07:5	13982-63-3	
Radium-228		0.387 ± 0.439 (0.926) C:82% T:77%	pCi/L	04/18/19 12:23	7 15262-20-1	
Total Radium	Total Radium Calculation	0.690 ± 0.753 (1.55)	pCi/L	04/22/19 11:17	7 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Sample: BGWC-19 PWS:	<b>Lab ID: 26170770</b> Site ID:	O2 Collected: 04/03/19 11:55 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.668 ± 0.388 (0.627) C:91% T:NA	pCi/L	04/17/19 07:57	7 13982-63-3	
Radium-228		0.312 ± 0.356 (0.747) C:81% T:80%	pCi/L	04/18/19 11:48	3 15262-20-1	
Total Radium	Total Radium Calculation	0.980 ± 0.744 (1.37)	pCi/L	04/22/19 11:21	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Sample: BGWC-20 PWS:	<b>Lab ID: 26170770</b> Site ID:	Collected: 04/03/19 10:30 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.478 ± 0.297 (0.454) C:94% T:NA	pCi/L	04/17/19 07:55	13982-63-3	
Radium-228		0.0890 ± 0.377 (0.848) C:82% T:89%	pCi/L	04/18/19 12:27	7 15262-20-1	
Total Radium	Total Radium Calculation	0.567 ± 0.674 (1.30)	pCi/L	04/22/19 11:17	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Sample: BGWC-21 PWS:	<b>Lab ID: 26170770</b> Site ID:	Collected: 04/03/19 14:05 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.315 ± 0.232 (0.335) C:91% T:NA	pCi/L	04/17/19 08:07	7 13982-63-3	
Radium-228	EPA 9320	0.217 ± 0.307 (0.659) C:82% T:82%	pCi/L	04/18/19 14:52	2 15262-20-1	
Total Radium	Total Radium Calculation	$0.532 \pm 0.539  (0.994)$	pCi/L	04/22/19 11:21	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Sample: BGWC-22 PWS:	<b>Lab ID: 26170770</b> Site ID:	O5 Collected: 04/03/19 11:18 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		2.01 ± 0.615 (0.618) C:96% T:NA	pCi/L	04/17/19 07:57	7 13982-63-3	
Radium-228		0.465 ± 0.349 (0.677) C:80% T:78%	pCi/L	04/18/19 11:47	15262-20-1	
Total Radium	Total Radium Calculation	2.48 ± 0.964 (1.30)	pCi/L	04/22/19 11:21	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Sample: BGWC-23 PWS:	<b>Lab ID: 2617077</b> ( Site ID:	O06 Collected: 04/03/19 09:38 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	1.76 ± 0.601 (0.631) C:83% T:NA	pCi/L	04/17/19 07:54	13982-63-3	
Radium-228	EPA 9320	1.10 ± 0.457 (0.760) C:84% T:85%	pCi/L	04/18/19 12:27	15262-20-1	
Total Radium	Total Radium Calculation	2.86 ± 1.06 (1.39)	pCi/L	04/22/19 11:17	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Sample: BGWC-24 PWS:	<b>Lab ID: 26170770</b> Site ID:	Collected: 04/03/19 16:36 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		2.38 ± 0.651 (0.375) C:98% T:NA	pCi/L	04/17/19 08:07	7 13982-63-3	
Radium-228	EPA 9320	1.22 ± 0.463 (0.705) C:77% T:90%	pCi/L	04/18/19 14:52	2 15262-20-1	
Total Radium	Total Radium Calculation	3.60 ± 1.11 (1.08)	pCi/L	04/22/19 11:21	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Sample: FBL040319 PWS:	<b>Lab ID: 26170770</b> Site ID:	O8 Collected: 04/03/19 12:46 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.0891 ± 0.172 (0.395) C:96% T:NA	pCi/L	04/17/19 08:07	7 13982-63-3	
Radium-228		-0.388 ± 0.247 (0.665) C:80% T:84%	pCi/L	04/18/19 11:48	3 15262-20-1	
Total Radium	Total Radium Calculation	0.0891 ± 0.419 (1.06)	pCi/L	04/22/19 11:21	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Sample: EQBL040319 PWS:	<b>Lab ID: 26170770</b> Site ID:	09 Collected: 04/03/19 12:50 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.344 ± 0.240 (0.347) C:95% T:NA	pCi/L	04/17/19 08:07	7 13982-63-3	
Radium-228		0.451 ± 0.371 (0.731) C:76% T:71%	pCi/L	04/18/19 11:48	3 15262-20-1	
Total Radium	Total Radium Calculation	0.795 ± 0.611 (1.08)	pCi/L	04/22/19 11:21	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

QC Batch: 337919 Analysis Method: EPA 9315

QC Batch Method: EPA 9315 Analysis Description: 9315 Total Radium
Associated Lab Samples: 2617077002, 2617077004, 2617077005, 2617077007, 2617077008, 2617077009

METHOD BLANK: 1644532 Matrix: Water

Associated Lab Samples: 2617077002, 2617077004, 2617077005, 2617077007, 2617077008, 2617077009

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-226 0.211  $\pm$  0.257 (0.538) C:93% T:NA pCi/L 04/17/19 07:57

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

QC Batch: 337917 Analysis Method: EPA 9315

QC Batch Method: EPA 9315 Analysis Description: 9315 Total Radium

Associated Lab Samples: 2617077001, 2617077003, 2617077006

METHOD BLANK: 1644525 Matrix: Water

Associated Lab Samples: 2617077001, 2617077003, 2617077006

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-226 0.221  $\pm$  0.211 (0.378) C:90% T:NA pCi/L 04/17/19 08:36

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

QC Batch: 337911 Analysis Method: EPA 9320
QC Batch Method: EPA 9320 Analysis Description: 9320 Radium 228

Associated Lab Samples: 2617077001, 2617077003, 2617077006

METHOD BLANK: 1644521 Matrix: Water

Associated Lab Samples: 2617077001, 2617077003, 2617077006

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.526 ± 0.315 (0.569) C:87% T:76%
 pCi/L
 04/18/19 12:31

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

 QC Batch:
 337912
 Analysis Method:
 EPA 9320

 QC Batch Method:
 EPA 9320
 Analysis Description:
 9320 Radium 228

 Associated Lab Samples:
 2617077002, 2617077004, 2617077005, 2617077007, 2617077008, 2617077009

METHOD BLANK: 1644522 Matrix: Water

Associated Lab Samples: 2617077002, 2617077004, 2617077005, 2617077007, 2617077008, 2617077009

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.129 ± 0.341 (0.763) C:81% T:73%
 pCi/L
 04/18/19 11:47

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



## **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 04/29/2019 03:31 PM

PASI-PA Pace Analytical Services - Greensburg



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617077

Date: 04/29/2019 03:31 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2617077001	BGWA-33	EPA 9315	337917		
2617077002	BGWC-19	EPA 9315	337919		
2617077003	BGWC-20	EPA 9315	337917		
2617077004 2617077005	BGWC-21 BGWC-22	EPA 9315 EPA 9315	337919 337919		
2617077006	BGWC-23	EPA 9315	337917		
2617077007 2617077008 2617077009	BGWC-24 FBL040319 EQBL040319	EPA 9315 EPA 9315 EPA 9315	337919 337919 337919		
2617077001	BGWA-33	EPA 9320	337911		
2617077002	BGWC-19	EPA 9320	337912		
2617077003	BGWC-20	EPA 9320	337911		
2617077004 2617077005	BGWC-21 BGWC-22	EPA 9320 EPA 9320	337912 337912		
2617077006	BGWC-23	EPA 9320	337911		
2617077007 2617077008 2617077009	BGWC-24 FBL040319 EQBL040319	EPA 9320 EPA 9320 EPA 9320	337912 337912 337912		
2617077001	BGWA-33	Total Radium Calculation	339290		
2617077002	BGWC-19	Total Radium Calculation	339291		
2617077003	BGWC-20	Total Radium Calculation	339290		
2617077004 2617077005	BGWC-21 BGWC-22	Total Radium Calculation Total Radium Calculation	339291 339291		
2617077006	BGWC-23	Total Radium Calculation	339290		
2617077007 2617077008 2617077009	BGWC-24 FBL040319 EQBL040319	Total Radium Calculation Total Radium Calculation Total Radium Calculation	339291 339291 339291		



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 Of I		Control Regulatory Agoncy Street Control		State		Requested Analysis Filtered (Y/N)		alum 226, 228 seidual Chlorine (Y/N)		×	×	*	×	<b>X</b>	X			× MO#: 2617077		ZOITOTI SAMPLE CONDITIONS	╫╴	43.19 16.63	4/4/9 11200:3 x x x	2	1	ody (er (b) (b)	EW
Soction C Invoice information: Attention:	Company Name:	Address	Pace Ougle:	Page Project Manager. betsy.mcdaniel@pacelabs.com.	l		N/	HO SS203 GD Indicate	DH CH	X	×××	X X X	2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	w	2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	4 X X	x x x	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		TATE THE ACCEPTED BY JAPPILIATION		519 10.20 Davis	and a fram our	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	HGIATURE	4. Kerin Stephenson	1
21		copy to: Geosymec	Dumbace Order # 000100000	Dried Name Dies Bound Ach Dood	Order #		_	지 수 등 등 등 등 등 등 등 등 등 등 등 등 등 등 등 등 등 등	-+-	tor 6 413119 1028	W G 413/19 1155	VI 6 415119 1030	WIG 413/19 1405	W 6 415/19 1118	W 6 413119 0938	W 6 4/3/19 1636	M6 413/19 12416	6 413119 12		-		Parish 4.			SAMPLER NAME AND SIGNATURE	PRINT Name of SAI	As to Buttakola
	oal Combustion Residuals			o.com	Op-(239   ax.	requested Due Date:		SAMPLE ID One Charactor por box Wee (A-Z 0-91, -) Sample 1ds must be unique Trissee		86- HAP8		BEW C - 20	'			l	6 2 2 11 2 10 2	Eagle403 19			ADDITIONAL COMMENTS	App. IV Parameters: As, Ba, Be, Cd, Co, Cr, Hg, Li, Mo, Pb, Se, Tl Onlyl					

Service Services	Gampi	Condition	oboti Kecethi		1
Face Anal	vtical Client Name:	GCA	Powere	Project #	
i racking #:	x 🗌 UPS 🗍 USPS 🗍 Client [			WO# : 26	
Custody Seal on C	ooler/Box Present: yes	no Seals	intact: Type	PM: BM	Due Date: 05/03/
	☐ Bubble Wrap ☐ Bubble Bag	İ		CLIENT: GAP	uer-cck
Thermometer Use	20		Blue None	Samples on ice con	oling,process has begun
Cooler Temperatu		•	is Frozen: Yes No	Date and Initial	s of person examining
Temp should be abov			Comments:	contents:	45/19 M
Chain of Custody P	resent:	es 🗆 No 🗆 N/A	1.		
Chain of Custody F	lled Out:	es DNo DN/A	2.		
Chain of Custody R	elinquished:	es □No □N/A	3		
Sampler Name & S	gnature on COC:	es □No □N/A	4.		
Samples Arrived wi		es 🗆 No 🗆 N/A	5.	:	
Short Hold Time A		es ☑Mo □N/A	6.		
Rush Turn Around	Time Requested:	es ☑No □N/A	7.		
Sufficient Volume:		es □No □N/A	8.		
Correct Containers	Üsed: -⊠⊽	es □no □n/A	9.		
-Pace Container	Used:	BS □NO □N/A			
Containers Intact:	Æ	es □no □n/a	10.		
Filtered volume rece	ved for Dissolved tests	es □No -ŪN/A	11.		
Sample Labels mate	h COC:	BS □NO □N/A	12.		
-Includes date/tir	ne/ID/Analysis Matrix:	W			
An comaniers needing p	reservation have been checked.	s 🗆 No 🗆 N/A	13.		
All containers needing compliance with EPA r	preservation are found to be in ecommendation.	es □No □N/A			
exceptions: VOA, coliforn	n, TOC, O&G, WI-DRO (water)	s ANO	Initial when completed	Lot # of added preservative	
Samples checked for	r dechlorination:	s □No ☑M7A	14.	:	
Headspace in VOA	Vials ( >6mm): □Y	s □No ÆNÃ	15.		
Trip Blank Present:	ΩY	s DNo ĐNA	16.		-71
Trip Blank Custody	Seals Present 🗆 Y	s 🗆 No 🗖 NIA			
Pace Trip Blank Lot	# (if purchased):				
Client Notification/	Resolution:			Field Data Required	
Person Conta		Date/T	ime:	Field Data Required	? Y / N
Comments/ Resolu					
			-		
		·			
Project Manager	Review:			Date:	
Note: Whenever there	is a discrepancy affecting North Carolina	compliance sam	ples, a copy of this forr	n will be sent to the North	Carolina DEHNR
Certification Office ( i.e	out of hold, incorrect preservative, out	of temp, incorrect	containers)		
				F-ALLC003	rev.3, 11September200621 of 21





May 03, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This revised report replaces the one issued on 4/15/2019. The report has been revised to correct metals units and target list per consultant request. No other changes have been made to this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton Moamel

betsy.mcdaniel@pacelabs.com

(770)734-4200

Project Manager

**Enclosures** 

cc: Whitney Law, Geosyntec Consultants
Noelia Muskus, Geosyntec Consultants
Rebecca Thornton, Pace Analytical Atlanta





## **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

**Atlanta Certification IDs** 

110 Technology Parkway Peachtree Corners, GA 30092

Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812

Georgia DW Inorganics Certification #: 812 Virginia Certification #: 460204 Georgia DW Microbiology Certification #: 812

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804 Florida/NELAP Certification #: E87648 Massachusetts Certification #: M-NC030

North Carolina Drinking Water Certification #: 37712

North Carolina Wastewater Certification #: 40 South Carolina Certification #: 99030001 Virginia/VELAP Certification #: 460222

North Carolina Certification #: 381

South Carolina Certification #: 98011001



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2617079001	BGWC-14	Water	04/04/19 09:03	04/05/19 11:20
2617079002	BGWC-25	Water	04/04/19 10:28	04/05/19 11:20
2617079003	BGWC-31	Water	04/04/19 11:10	04/05/19 11:20
2617079004	BGWC-34D	Water	04/04/19 15:50	04/05/19 11:20
2617079005	BGWC-35D	Water	04/04/19 12:40	04/05/19 11:20
2617079006	Dup-3	Water	04/04/19 00:00	04/05/19 11:20
2617079007	FBL040419	Water	04/04/19 12:44	04/05/19 11:20
2617079008	EQBL040419	Water	04/04/19 12:58	04/05/19 11:20



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2617079001	BGWC-14	EPA 6020B	JMW1, SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617079002 BGWC-25	BGWC-25	EPA 6020B	JMW1, SER	13	PASI-A
	EPA 7470A	RDT	1	PASI-A	
	SM 2540C	RLC	1	PASI-GA	
	EPA 300.0	RLC	3	PASI-GA	
2617079003 BGWC-31	EPA 6020B	SER	13	PASI-A	
	EPA 7470A	RDT	1	PASI-A	
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617079004 BGWC-34D	BGWC-34D	EPA 6020B	JMW1, SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617079005 BGWC-35D	EPA 6020B	SER	13	PASI-A	
	EPA 7470A	RDT	1	PASI-A	
		SM 2540C	RLC	1	PASI-GA
	EPA 300.0	RLC	3	PASI-GA	
617079006	Dup-3	EPA 6020B	JMW1, SER	13	PASI-A
	EPA 7470A	RDT	1	PASI-A	
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
617079007	FBL040419	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
617079008	EQBL040419	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA



# **ANALYTICAL RESULTS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

Sample: BGWC-14	Lab ID:	2617079001	Collecte	ed: 04/04/19	9 09:03	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00041J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 21:32	7440-38-2	В
Barium	0.049	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 21:32	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 21:32	7440-41-7	
Boron	0.79J	mg/L	1.0	0.026	10	04/09/19 20:29	04/11/19 17:17	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 21:32	7440-43-9	
Calcium	98.0	mg/L	10.0	0.41	20	04/09/19 20:29	04/12/19 02:12	7440-70-2	
Chromium	0.00057J	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 21:32	7440-47-3	
Cobalt	0.00015J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 21:32	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 21:32	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 21:32	7439-93-2	
Molybdenum	0.0088J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 21:32	7439-98-7	
Selenium	0.00014J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 21:32	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 21:32	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 21:54	04/12/19 10:29	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	617	mg/L	25.0	10.0	1		04/11/19 19:35		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	33.7	mg/L	0.25	0.024	1		04/09/19 22:05	16887-00-6	M1
Fluoride	0.44	mg/L	0.30	0.029	1		04/09/19 22:05	16984-48-8	
Sulfate	255	mg/L	10.0	0.17	10		04/09/19 22:27		M1



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

Sample: BGWC-25	Lab ID:	2617079002	Collecte	ed: 04/04/19	9 10:28	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	thod: EF	PA 3010A			
Arsenic	0.0016J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/11/19 17:20	7440-38-2	
Barium	0.016	mg/L	0.010	0.000060	1	04/09/19 20:29	04/11/19 17:20	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/11/19 17:20	7440-41-7	
Boron	0.020J	mg/L	0.10	0.0026	1	04/09/19 20:29	04/11/19 17:20	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/11/19 17:20	7440-43-9	
Calcium	54.8	mg/L	10.0	0.41	20	04/09/19 20:29	04/12/19 02:15	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/11/19 17:20	7440-47-3	
Cobalt	0.00022J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/11/19 17:20	7440-48-4	
₋ead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/11/19 17:20	7439-92-1	
₋ithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/11/19 17:20	7439-93-2	
Molybdenum	0.00096J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/11/19 17:20	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 20:29	04/11/19 17:20	7782-49-2	
Γhallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/11/19 17:20	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	thod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 21:54	04/12/19 10:41	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	2540C						
Total Dissolved Solids	196	mg/L	25.0	10.0	1		04/11/19 19:35		
800.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	3.8	mg/L	0.25	0.024	1		04/09/19 23:31	16887-00-6	
Fluoride	ND	mg/L	0.30	0.029	1		04/09/19 23:31	16984-48-8	
Sulfate	11.4	mg/L	1.0	0.017	1		04/09/19 23:31	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

Sample: BGWC-31	Lab ID:	2617079003	Collecte	ed: 04/04/19	9 11:10	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.0036J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 21:39	7440-38-2	
Barium	0.032	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 21:39	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 21:39	7440-41-7	
Boron	0.59J	mg/L	1.0	0.026	10	04/09/19 20:29	04/11/19 17:27	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 21:39	7440-43-9	
Calcium	69.3	mg/L	5.0	0.21	10	04/09/19 20:29	04/11/19 17:27	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 21:39	7440-47-3	
Cobalt	0.00051J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 21:39	7440-48-4	
Lead	0.00065J	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 21:39	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 21:39	7439-93-2	
Molybdenum	0.00033J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 21:39	7439-98-7	
Selenium	0.000080J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 21:39	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 21:39	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 21:54	04/12/19 10:43	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	350	mg/L	25.0	10.0	1		04/11/19 19:35		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	32.7	mg/L	0.25	0.024	1		04/09/19 23:52	16887-00-6	
Fluoride	ND	mg/L	0.30	0.029	1		04/09/19 23:52	16984-48-8	
Sulfate	105	mg/L	10.0	0.17	10		04/10/19 00:13	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

Sample: BGWC-34D	Lab ID:	2617079004	Collecte	ed: 04/04/19	9 15:50	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.015	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/11/19 17:38	7440-38-2	
Barium	0.031	mg/L	0.010	0.000060	1	04/09/19 20:29	04/11/19 17:38	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/11/19 17:38	7440-41-7	
Boron	0.15	mg/L	0.10	0.0026	1	04/09/19 20:29	04/11/19 17:38	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/11/19 17:38	7440-43-9	
Calcium	104	mg/L	10.0	0.41	20	04/09/19 20:29	04/12/19 02:19	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/11/19 17:38	7440-47-3	
Cobalt	0.00042J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/11/19 17:38	7440-48-4	
Lead	0.000054J	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/11/19 17:38	7439-92-1	
Lithium	0.00068J	mg/L	0.050	0.00042	1	04/09/19 20:29	04/11/19 17:38	7439-93-2	
Molybdenum	0.0011J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/11/19 17:38	7439-98-7	
Selenium	0.00010J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/11/19 17:38	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/11/19 17:38	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 21:54	04/12/19 10:46	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	2540C						
Total Dissolved Solids	419	mg/L	25.0	10.0	1		04/11/19 19:35		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	28.4	mg/L	0.25	0.024	1		04/10/19 00:35	16887-00-6	
Fluoride	0.035J	mg/L	0.30	0.029	1		04/10/19 00:35	16984-48-8	
Sulfate	88.0	mg/L	5.0	0.085	5		04/10/19 00:56		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

Sample: BGWC-35D	Lab ID:	2617079005	Collecte	ed: 04/04/19	9 12:40	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical I	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.0018J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 22:14	7440-38-2	
Barium	0.071	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 22:14	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 22:14	7440-41-7	
Boron	8.3	mg/L	5.0	0.13	50	04/09/19 20:29	04/11/19 17:45	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 22:14	7440-43-9	
Calcium	442	mg/L	25.0	1.0	50	04/09/19 20:29	04/11/19 17:45	7440-70-2	
Chromium	0.0011J	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 22:14	7440-47-3	
Cobalt	0.0011J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 22:14	7440-48-4	
Lead	0.00023J	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 22:14	7439-92-1	
Lithium	0.0096J	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 22:14	7439-93-2	
Molybdenum	0.030	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 22:14	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 22:14	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 22:14	7440-28-0	
7470 Mercury	Analytical I	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 21:54	04/12/19 10:48	7439-97-6	
2540C Total Dissolved Solids	Analytical I	Method: SM 2	540C						
Total Dissolved Solids	1930	mg/L	25.0	10.0	1		04/11/19 19:35		
300.0 IC Anions 28 Days	Analytical I	Method: EPA	300.0						
Chloride	605	mg/L	12.5	1.2	50		04/10/19 03:04	16887-00-6	
Fluoride	0.26J	mg/L	0.30	0.029	1		04/10/19 01:17		
Sulfate	643	mg/L	50.0	0.85	50		04/10/19 03:04		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

Sample: Dup-3	Lab ID:	2617079006	Collecte	ed: 04/04/19	00:00	Received: 04/	/05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.0016J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 22:18	7440-38-2	
Barium	0.015	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 22:18	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 22:18	7440-41-7	
Boron	0.076J	mg/L	0.50	0.013	5	04/09/19 20:29	04/11/19 17:48	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 22:18	7440-43-9	
Calcium	48.4	mg/L	10.0	0.41	20	04/09/19 20:29	04/12/19 02:22	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 22:18	7440-47-3	
Cobalt	0.00020J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 22:18	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 22:18	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 22:18	7439-93-2	
Molybdenum	0.00096J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 22:18	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 22:18	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 22:18	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre <sub>l</sub>	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 21:54	04/12/19 10:50	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	207	mg/L	25.0	10.0	1		04/11/19 20:52		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	4.0	mg/L	0.25	0.024	1		04/10/19 03:25	16887-00-6	
Fluoride	ND	mg/L	0.30	0.029	1		04/10/19 03:25	16984-48-8	
Sulfate	11.3	mg/L	1.0	0.017	1		04/10/19 03:25	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

Sample: FBL040419	Lab ID:	2617079007	Collecte	ed: 04/04/19	9 12:44	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Me	thod: Ef	PA 3010A			
Arsenic	ND	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/11/19 17:52	7440-38-2	
Barium	0.000071J	mg/L	0.010	0.000060	1	04/09/19 20:29	04/11/19 17:52	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/11/19 17:52	7440-41-7	
Boron	0.0043J	mg/L	0.10	0.0026	1	04/09/19 20:29	04/11/19 17:52	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/11/19 17:52	7440-43-9	
Calcium	ND	mg/L	0.50	0.021	1	04/09/19 20:29	04/11/19 17:52	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/11/19 17:52	7440-47-3	
Cobalt	ND	mg/L	0.010	0.000050	1	04/09/19 20:29	04/11/19 17:52	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/11/19 17:52	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/11/19 17:52	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00010	1	04/09/19 20:29	04/11/19 17:52	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 20:29	04/11/19 17:52	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/11/19 17:52	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	thod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 21:54	04/12/19 10:53	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	15.0J	mg/L	25.0	10.0	1		04/11/19 20:53		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	0.073J	mg/L	0.25	0.024	1		04/10/19 04:08	16887-00-6	В
Fluoride	ND	mg/L	0.30	0.029	1		04/10/19 04:08		
Sulfate	0.028J	mg/L	1.0	0.017	1		04/10/19 04:08		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

Sample: EQBL040419	Lab ID:	2617079008	Collecte	ed: 04/04/19	12:58	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	ND	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/11/19 17:56	7440-38-2	
Barium	ND	mg/L	0.010	0.000060	1	04/09/19 20:29	04/11/19 17:56	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/11/19 17:56	7440-41-7	
Boron	ND	mg/L	0.10	0.0026	1	04/09/19 20:29	04/11/19 17:56	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/11/19 17:56	7440-43-9	
Calcium	ND	mg/L	0.50	0.021	1	04/09/19 20:29	04/11/19 17:56	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/11/19 17:56	7440-47-3	
Cobalt	ND	mg/L	0.010	0.000050	1	04/09/19 20:29	04/11/19 17:56	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/11/19 17:56	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/11/19 17:56	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00010	1	04/09/19 20:29	04/11/19 17:56	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 20:29	04/11/19 17:56	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/11/19 17:56	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 21:54	04/12/19 10:55	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	ND	mg/L	25.0	10.0	1		04/11/19 20:53		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	0.077J	mg/L	0.25	0.024	1		04/10/19 04:29	16887-00-6	В
Fluoride	ND	mg/L	0.30	0.029	1		04/10/19 04:29	16984-48-8	
Sulfate	0.028J	mg/L	1.0	0.017	1		04/10/19 04:29		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

QC Batch: 468642 Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury

Associated Lab Samples: 2617079001, 2617079002, 2617079003, 2617079004, 2617079005, 2617079006, 2617079007, 2617079008

METHOD BLANK: 2545437 Matrix: Water

Associated Lab Samples: 2617079001, 2617079002, 2617079003, 2617079004, 2617079005, 2617079006, 2617079007, 2617079008

Blank Reporting

 Parameter
 Units
 Result
 Limit
 MDL
 Analyzed
 Qualifiers

 Mercury
 mg/L
 ND
 0.00020
 0.00010
 04/12/19 10:24

LABORATORY CONTROL SAMPLE: 2545438

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury mg/L 0.0025 0.0023 92 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2545439 2545440 MS MSD 2617079001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual 0.0023 75-125 0 25 Mercury mg/L ND 0.0025 0.0025 0.0023 93 93

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

QC Batch: 468329 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET

Associated Lab Samples: 2617079001, 2617079002, 2617079003, 2617079004, 2617079005, 2617079006, 2617079007, 2617079008

METHOD BLANK: 2544088 Matrix: Water

Associated Lab Samples: 2617079001, 2617079002, 2617079003, 2617079004, 2617079005, 2617079006, 2617079007, 2617079008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	0.000062J	0.0050	0.000060	04/10/19 19:29	
Barium	mg/L	ND	0.010	0.000060	04/10/19 19:29	
Beryllium	mg/L	ND	0.0030	0.000050	04/10/19 19:29	
Boron	mg/L	ND	0.10	0.0026	04/10/19 19:29	
Cadmium	mg/L	ND	0.0010	0.000070	04/10/19 19:29	
Calcium	mg/L	ND	0.50	0.021	04/10/19 19:29	
Chromium	mg/L	ND	0.010	0.00042	04/10/19 19:29	
Cobalt	mg/L	ND	0.010	0.000050	04/10/19 19:29	
Lead	mg/L	ND	0.0050	0.000050	04/10/19 19:29	BC
Lithium	mg/L	ND	0.050	0.00042	04/10/19 19:29	
Molybdenum	mg/L	ND	0.010	0.00010	04/10/19 19:29	
Selenium	mg/L	ND	0.010	0.000080	04/10/19 19:29	
Thallium	mg/L	ND	0.0010	0.000060	04/10/19 19:29	

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
rsenic	mg/L	0.01	0.010	103	80-120	
Sarium	mg/L	0.05	0.050	99	80-120	
Beryllium	mg/L	0.01	0.0095	95	80-120	
oron	mg/L	0.05	0.049J	98	80-120	
Cadmium	mg/L	0.01	0.010	102	80-120	
alcium	mg/L	0.62	0.64	102	80-120	
nromium	mg/L	0.05	0.050	101	80-120	
balt	mg/L	0.01	0.010	101	80-120	
ad	mg/L	0.05	0.051	101	80-120 E	3C
hium	mg/L	0.05	0.052	104	80-120	
olybdenum	mg/L	0.05	0.052	103	80-120	
elenium	mg/L	0.05	0.051	102	80-120	
allium	mg/L	0.01	0.010	101	80-120	

MATRIX SPIKE & MATRIX SPIK	E DUPLIC	CATE: 254409	2544091									
			MS	MSD								
		2617082009	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Arsenic	mg/L	0.00012J	0.01	0.01	0.0092	0.0091	91	90	75-125	1	20	
Barium	mg/L	0.025	0.05	0.05	0.068	0.067	87	85	75-125	2	20	
Beryllium	mg/L	ND	0.01	0.01	0.0081	0.0080	80	79	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	ATE: 254409	90		2544091							
Parameter	Units	2617082009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	mg/L	0.49J	0.05	0.05	0.56	0.58	137	180	75-125	4	20	M1
Cadmium	mg/L	ND	0.01	0.01	0.0091	0.0091	91	90	75-125	0	20	
Calcium	mg/L	55.8	0.62	0.62	54.5	53.7	-203	-330	75-125	1	20	M6
Chromium	mg/L	ND	0.05	0.05	0.045	0.044	89	88	75-125	1	20	
Cobalt	mg/L	0.00010J	0.01	0.01	0.0089J	0.0088J	88	87	75-125	1	20	
Lead	mg/L	ND	0.05	0.05	0.044	0.045	88	90	75-125	2	20	
Lithium	mg/L	ND	0.05	0.05	0.044J	0.044J	89	87	75-125	2	20	
Molybdenum	mg/L	ND	0.05	0.05	0.046	0.046	92	93	75-125	1	20	
Selenium	mg/L	0.00091J	0.05	0.05	0.046	0.045	90	88	75-125	2	20	
Thallium	mg/L	ND	0.01	0.01	0.0088	0.0090	88	90	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

QC Batch: 26251 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 2617079001, 2617079002, 2617079003, 2617079004, 2617079005

LABORATORY CONTROL SAMPLE: 118507

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Dissolved Solids** mg/L 400 404 101 84-108

SAMPLE DUPLICATE: 118508

2617035009 Dup Max RPD RPD Qualifiers Units Parameter Result Result **Total Dissolved Solids** 85.0 50.0 52 10 D6 mg/L

SAMPLE DUPLICATE: 118509

Date: 05/03/2019 10:30 AM

2617069003 Dup Max Result RPD RPD Qualifiers Parameter Units Result mg/L 340 **Total Dissolved Solids** 341 0 10

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

QC Batch: 26252 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 2617079006, 2617079007, 2617079008

LABORATORY CONTROL SAMPLE: 118510

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Dissolved Solids** mg/L 400 408 102 84-108

SAMPLE DUPLICATE: 118512

Date: 05/03/2019 10:30 AM

2617150003 Dup Max Parameter RPD RPD Units Result Result Qualifiers **Total Dissolved Solids** 2310 2380 3 10 mg/L

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

QC Batch: 26063 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 2617079001, 2617079002, 2617079003, 2617079004, 2617079005, 2617079006, 2617079007, 2617079008

METHOD BLANK: 117675 Matrix: Water

Associated Lab Samples: 2617079001, 2617079002, 2617079003, 2617079004, 2617079005, 2617079006, 2617079007, 2617079008

		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.053J	0.25	0.024	04/09/19 21:23	
Fluoride	mg/L	ND	0.30	0.029	04/09/19 21:23	
Sulfate	ma/l	ND	1.0	0.017	04/09/19 21 23	

LABORATORY CONTROL SAMPLE:	117676					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	10	10.1	101	90-110	
Fluoride	mg/L	10	10.1	101	90-110	
Sulfate	mg/L	10	9.9	99	90-110	

MATRIX SPIKE & MATRIX SPIR	KE DUPLIC	CATE: 117677	7		117678							
			MS	MSD								
		2617079001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	33.7	10	10	40.3	40.3	65	65	90-110	0	15	M1
Fluoride	mg/L	0.44	10	10	10.2	10.1	97	97	90-110	0	15	
Sulfate	mg/L	255	10	10	178	178	-769	-769	90-110	0	15	E,M1

MATRIX SPIKE SAMPLE:	117679						
Parameter	Units	2617079002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	3.8	10	13.4	96	90-110	
Fluoride	mg/L	ND	10	9.9	99	90-110	
Sulfate	mg/L	11.4	10	20.5	91	90-110	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **LABORATORIES**

PASI-A	Pace Analytical Services - Asheville
PASI-GA	Pace Analytical Services - Atlanta, GA

### **ANALYTE QUALIFIERS**

Date: 05/03/2019 10:30 AM

В	Analyte was detected in the associated method blank.
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BC The same analyte was detected in an associated blank at a concentration above 1/2 the reporting limit but below the

laboratory reporting limit.

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617079

Date: 05/03/2019 10:30 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2617079001	BGWC-14	EPA 3010A	468329	EPA 6020B	468391
2617079002	BGWC-25	EPA 3010A	468329	EPA 6020B	468391
2617079003	BGWC-31	EPA 3010A	468329	EPA 6020B	468391
2617079004	BGWC-34D	EPA 3010A	468329	EPA 6020B	468391
2617079005	BGWC-35D	EPA 3010A	468329	EPA 6020B	468391
2617079006	Dup-3	EPA 3010A	468329	EPA 6020B	468391
2617079007	FBL040419	EPA 3010A	468329	EPA 6020B	468391
2617079008	EQBL040419	EPA 3010A	468329	EPA 6020B	468391
2617079001	BGWC-14	EPA 7470A	468642	EPA 7470A	468914
2617079002	BGWC-25	EPA 7470A	468642	EPA 7470A	468914
2617079003	BGWC-31	EPA 7470A	468642	EPA 7470A	468914
2617079004	BGWC-34D	EPA 7470A	468642	EPA 7470A	468914
2617079005	BGWC-35D	EPA 7470A	468642	EPA 7470A	468914
2617079006	Dup-3	EPA 7470A	468642	EPA 7470A	468914
2617079007	FBL040419	EPA 7470A	468642	EPA 7470A	468914
2617079008	EQBL040419	EPA 7470A	468642	EPA 7470A	468914
2617079001	BGWC-14	SM 2540C	26251		
2617079002	BGWC-25	SM 2540C	26251		
2617079003	BGWC-31	SM 2540C	26251		
2617079004	BGWC-34D	SM 2540C	26251		
2617079005	BGWC-35D	SM 2540C	26251		
2617079006	Dup-3	SM 2540C	26252		
2617079007	FBL040419	SM 2540C	26252		
2617079008	EQBL040419	SM 2540C	26252		
2617079001	BGWC-14	EPA 300.0	26063		
2617079002	BGWC-25	EPA 300.0	26063		
2617079003	BGWC-31	EPA 300.0	26063		
2617079004	BGWC-34D	EPA 300.0	26063		
2617079005	BGWC-35D	EPA 300.0	26063		
2617079006	Dup-3	EPA 300.0	26063		
2617079007	FBL040419	EPA 300.0	26063		
2617079008	EQBL040419	EPA 300.0	26063		



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Pace Analy	<i>tical<sup>*</sup></i> Client Name:	GCA	Powere	Project #	
Tracking #:	x UPS USPS Client Cooler/Box Present: yes		Т	WO#: 26	017079 Due Date: 04/12/1
Custody Seal on C	ooler/Box Present: 🖊 yes 🗌	no Seals	intact: yes	CLIENT: GAPO	uer=CCR
	☐ Bubble Wrap ☐ Bubble Bags	_		<u> </u>	
Thermometer Used			Blue None	Samples on ice, coo	
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Chain of Custody Fi	led Out:	S □No □N/A	2.		
Chain of Custody R		es □No □N/A			
Sampler Name & Si		s No N/A			
Samples Arrived wit		BS No N/A			
Short Hold Time A		BS DNO DN/A			
Rush Turn Around		BS DINO DIN/A			
Sufficient Volume:		es 🗆 No 🗆 N/A	8.		
Correct Containers	Used: -ETY	es □No □N/A	9.		
-Pace Container	Used:	is □No □N/A			
Containers Intact:		es 🗆 No 🗆 N/A	10.		
Filtered volume rece	ved for Dissolved tests	es 🗆 No 🗝 🗖 N/A	11.		
Sample Labels mate	h COC: —Br	es ⊡No ⊡N/A	12.		
-Includes date/tir	ne/ID/Analysis Matrix:	$\omega$			
All containers needing p	reservation have been checked.	es ONo ON/A	13.		
All containers needing compliance with EPA	preservation are found to be in	es □No □N/A			
exceptions: VOA colifor	m, TOC, O&G, WI-DRO (water)	es 12170	Initial when completed	Lot # of added	
	, 100, 000, Wi-Dito (Water)	*.**.		preservative	
Samples checked for		es 🗆 No 🔎 M7A		!	
Headspace in VOA		es DNo DNA			
Trip Blank Present:		es 🗆 No 🗷 N/A	16.		
Trip Blank Custody	Seals Present □Y	es □No ☑M/A		:	
Pace Trip Blank Lot	# (if purchased):				
Client Notification	Resolution:			Field Data Required	? Y / N
	acted:	Date/	Time:	Tions saturated	
Comments/ Resol	III				
Project Manage	Review:			Date:	
Note: Whenever there	is a discrepancy affecting North Carolin	a compliance sec	nnles a conv of this for	m will be sent to the North	Carolina DEHNP
Certification Office ( i.e.	out of hold, incorrect preservative, out	of temp, incorrect	containers)	in was de sein to the NORG	Galollia DEFINA
	:			F-ALLC00	<b>3rev.3, 11Septemben26026</b> 2 of 22





April 29, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta



(770)734-4200



### **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

**Arkansas Certification** 

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Missouri Certification #: 235 Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706

North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249 Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282 South Dakota Certification

Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282

Vermont Dept. of Health: ID# V1-0262
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2617080001	BGWC-14	Water	04/04/19 09:03	04/05/19 11:20
2617080002	BGWC-25	Water	04/04/19 10:28	04/05/19 11:20
2617080003	BGWC-31	Water	04/04/19 11:10	04/05/19 11:20
2617080004	BGWC-34D	Water	04/04/19 15:50	04/05/19 11:20
2617080005	BGWC-35D	Water	04/04/19 12:40	04/05/19 11:20
2617080006	Dup-3	Water	04/04/19 00:00	04/05/19 11:20
2617080007	FBL040419	Water	04/04/19 12:44	04/05/19 11:20
2617080008	EQBL040419	Water	04/04/19 12:58	04/05/19 11:20



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2617080001	BGWC-14	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617080002	BGWC-25	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617080003	BGWC-31	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
617080004	BGWC-34D	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617080005	BGWC-35D	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617080006	Dup-3	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617080007	FBL040419	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617080008	EQBL040419	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

<b>Sample: BGWC-14</b> PWS:	<b>Lab ID</b> : <b>26170800</b> Site ID:	O1 Collected: 04/04/19 09:03 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		5.46 ± 1.20 (0.677) C:90% T:NA	pCi/L	04/17/19 07:50	13982-63-3	
Radium-228		3.02 ± 0.751 (0.693) C:85% T:78%	pCi/L	04/18/19 12:30	15262-20-1	
Total Radium	Total Radium Calculation	8.48 ± 1.95 (1.37)	pCi/L	04/22/19 11:17	7 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

Sample: BGWC-25 Lab ID: 2617080002 Collected: 04/04/19 10:28 Received: 04/05/19 11:20 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315 0.186 ± 0.242 (0.504) Radium-226 pCi/L 04/17/19 07:51 13982-63-3 C:86% T:NA EPA 9320 0.160 ± 0.372 (0.824) Radium-228 pCi/L 04/18/19 12:30 15262-20-1 C:84% T:79% Total Radium **Total Radium**  $0.346 \pm 0.614$  (1.33) pCi/L 04/22/19 11:17 7440-14-4 Calculation



Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

Sample: BGWC-31 PWS:	<b>Lab ID: 26170800</b> Site ID:	Collected: 04/04/19 11:10 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.808 ± 0.423 (0.604) C:80% T:NA	pCi/L	04/17/19 07:5	1 13982-63-3	
Radium-228		0.678 ± 0.386 (0.705) C:82% T:80%	pCi/L	04/18/19 12:30	15262-20-1	
Total Radium	Total Radium Calculation	1.49 ± 0.809 (1.31)	pCi/L	04/22/19 11:17	7 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

Sample: BGWC-34D PWS:	<b>Lab ID: 26170800</b> Site ID:	O4 Collected: 04/04/19 15:50 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	1.000 ± 0.448 (0.555) C:80% T:NA	pCi/L	04/17/19 07:54	13982-63-3	
Radium-228		0.891 ± 0.558 (1.07) C:82% T:62%	pCi/L	04/18/19 12:27	7 15262-20-1	
Total Radium	Total Radium Calculation	1.89 ± 1.01 (1.63)	pCi/L	04/22/19 11:17	7 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

Sample: BGWC-35D PWS:	<b>Lab ID: 26170800</b> Site ID:	05 Collected: 04/04/19 12:40 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		1.08 ± 0.459 (0.597) C:97% T:NA	pCi/L	04/17/19 07:5	1 13982-63-3	
Radium-228		1.29 ± 0.448 (0.635) C:86% T:82%	pCi/L	04/18/19 12:30	0 15262-20-1	
Total Radium	Total Radium Calculation	2.37 ± 0.907 (1.23)	pCi/L	04/22/19 11:17	7 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

Sample: Dup-3 PWS:	<b>Lab ID: 26170800</b> Site ID:	O06 Collected: 04/04/19 00:00 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.330 ± 0.253 (0.397) C:89% T:NA	pCi/L	04/17/19 07:50	13982-63-3	
Radium-228		0.224 ± 0.313 (0.672) C:85% T:80%	pCi/L	04/18/19 12:30	15262-20-1	
Total Radium	Total Radium Calculation	$0.554 \pm 0.566  (1.07)$	pCi/L	04/22/19 11:17	7 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

Sample: FBL040419 PWS:	<b>Lab ID: 26170800</b> Site ID:	O7 Collected: 04/04/19 12:44 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.121 ± 0.220 (0.501) C:90% T:NA	pCi/L	04/17/19 07:5	1 13982-63-3	
Radium-228		0.679 ± 0.367 (0.653) C:82% T:79%	pCi/L	04/18/19 12:30	15262-20-1	
Total Radium	Total Radium Calculation	$0.800 \pm 0.587 $ (1.15)	pCi/L	04/22/19 11:17	7 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

Sample: EQBL040419 PWS:	<b>Lab ID: 26170800</b> Site ID:	O8 Collected: 04/04/19 12:58 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.0490 ± 0.173 (0.440) C:89% T:NA	pCi/L	04/17/19 07:52	13982-63-3	
Radium-228		0.446 ± 0.427 (0.887) C:83% T:82%	pCi/L	04/18/19 12:27	15262-20-1	
Total Radium	Total Radium Calculation	0.495 ± 0.600 (1.33)	pCi/L	04/22/19 11:17	7440-14-4	



### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

QC Batch: 337911 Analysis Method: EPA 9320
QC Batch Method: EPA 9320 Analysis Description: 9320 Radium 228

Associated Lab Samples: 2617080001, 2617080002, 2617080003, 2617080004, 2617080005, 2617080006, 2617080007, 2617080008

METHOD BLANK: 1644521 Matrix: Water

Associated Lab Samples: 2617080001, 2617080002, 2617080003, 2617080004, 2617080005, 2617080006, 2617080007, 2617080008

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

QC Batch: 337917 Analysis Method: EPA 9315

QC Batch Method: EPA 9315 Analysis Description: 9315 Total Radium

Associated Lab Samples: 2617080001, 2617080002, 2617080003, 2617080004, 2617080005, 2617080006, 2617080007, 2617080008

METHOD BLANK: 1644525 Matrix: Water

Associated Lab Samples: 2617080001, 2617080002, 2617080003, 2617080004, 2617080005, 2617080006, 2617080007, 2617080008

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-226 0.221 ± 0.211 (0.378) C:90% T:NA pCi/L 04/17/19 08:36

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **LABORATORIES**

Date: 04/29/2019 03:32 PM

PASI-PA Pace Analytical Services - Greensburg



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617080

Date: 04/29/2019 03:32 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2617080001	BGWC-14	EPA 9315	337917		
2617080002	BGWC-25	EPA 9315	337917		
2617080003	BGWC-31	EPA 9315	337917		
2617080004	BGWC-34D	EPA 9315	337917		
2617080005	BGWC-35D	EPA 9315	337917		
2617080006	Dup-3	EPA 9315	337917		
2617080007	FBL040419	EPA 9315	337917		
2617080008	EQBL040419	EPA 9315	337917		
2617080001	BGWC-14	EPA 9320	337911		
2617080002	BGWC-25	EPA 9320	337911		
2617080003	BGWC-31	EPA 9320	337911		
2617080004	BGWC-34D	EPA 9320	337911		
2617080005	BGWC-35D	EPA 9320	337911		
2617080006	Dup-3	EPA 9320	337911		
2617080007	FBL040419	EPA 9320	337911		
2617080008	EQBL040419	EPA 9320	337911		
2617080001	BGWC-14	Total Radium Calculation	339290		
2617080002	BGWC-25	Total Radium Calculation	339290		
2617080003	BGWC-31	Total Radium Calculation	339290		
2617080004	BGWC-34D	Total Radium Calculation	339290		
2617080005	BGWC-35D	Total Radium Calculation	339290		
2617080006	Dup-3	Total Radium Calculation	339290		
2617080007	FBL040419	Total Radium Calculation	339290		
2617080008	EQBL040419	Total Radium Calculation	339290		



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Custody Seal on C	ooler/Box Present: yes	no Seals	intact: yes	PM: BM CLIENT: GAP	Due Date: 05/03/ ser-CCR
Packing Material:	Bubble Wrap Bubble Bags	None	Other		·
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		es DNo - DN/A	<del></del>		
Sample Labels mate		ts □no □n/A ム)	12. 		
<ul> <li>Includes date/tir</li> <li>All containers needing r</li> </ul>	reservation have been checked				······································
A11		es □No □N/A	13.		
compliance with EPA	preservation are found to be in ecommendation.	es 🗆 No 🗆 N/A			
exceptions: VOA, colifor	m, TOC, O&G, WI-DRO (water)	es DNo	Initial when completed	Lot # of added preservative	
Samples checked for	r dechlorination:	es 🗆 No 🔎 MA	14.		
Headspace in VOA	Vials ( >6mm):	es 🗆 No 🗷 NÃ	15.		
Trip Blank Present:	0,	es 🗆 No 🗗 N/A	16.		
Trip Blank Custody	Seals Present	es 🗆 No 🗖 NA	1		
Pace Trip Blank Lot	# (if purchased):				
Client Notification/	Resolution:			Field Data Required	? Y / N
Person Conta		Date/	Time:	Field Data Nequired	: I / N
Comments/ Resol					
				:	
		Ì			
Project Manage	Povious			Deter	
Froject Manage	Vealen:			Date:	
Note: Whenever there	is a discrepancy affecting North Carolir	a compliance sar	nples, a copy of this for	m will be sent to the North	Carolina DEHNR
Cartification Office / L.	and of hold incomes proportion and	letteres :		11	

F-ALLC003rev.3, 11Septempeg26068 of 18





May 24, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This revised report replaces the one issued on 4/18/2019. The report has been revised to correct mercury units per consultant request. No other changes have been made to this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton Moamed

betsy.mcdaniel@pacelabs.com

(770)734-4200

Project Manager

**Enclosures** 

cc: Whitney Law, Geosyntec Consultants
Noelia Muskus, Geosyntec Consultants
Rebecca Thornton, Pace Analytical Atlanta





### **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

**Atlanta Certification IDs** 

110 Technology Parkway Peachtree Corners, GA 30092

Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001

Virginia Certification #: 460204

**Asheville Certification IDs** 

2225 Riverside Drive, Asheville, NC 28804 Florida/NELAP Certification #: E87648 Massachusetts Certification #: M-NC030

North Carolina Drinking Water Certification #: 37712

North Carolina Wastewater Certification #: 40 South Carolina Certification #: 99030001 Virginia/VELAP Certification #: 460222



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2617082001	BGWC-10	Water	04/02/19 16:15	04/05/19 11:20
2617082002	BGWC-30	Water	04/02/19 10:24	04/05/19 11:20
2617082003	BGWC-36D	Water	04/02/19 12:10	04/05/19 11:20
2617082004	BGWC-17	Water	04/02/19 14:43	04/05/19 11:20
2617082005	BGWC-18	Water	04/02/19 16:28	04/05/19 11:20
2617082006	BGWC-7	Water	04/02/19 09:58	04/05/19 11:20
2617082007	BGWA-6	Water	04/02/19 11:33	04/05/19 11:20
2617082008	BGWC-16	Water	04/02/19 13:22	04/05/19 11:20
2617082009	Dup-2	Water	04/02/19 00:00	04/05/19 11:20
2617082010	FBL040219	Water	04/02/19 16:14	04/05/19 11:20
2617082011	EQBL040219	Water	04/02/19 16:20	04/05/19 11:20



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2617082001	BGWC-10	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617082002	BGWC-30	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617082003	BGWC-36D	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617082004	BGWC-17	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617082005	BGWC-18	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617082006	BGWC-7	EPA 6020B	JMW1, SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617082007	BGWA-6	EPA 6020B	JMW1, SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617082008	BGWC-16	EPA 6020B	JMW1, SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617082009	Dup-2	EPA 6020B	JMW1, SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617082010	FBL040219	EPA 6020B	SER	13	PASI-A

# **REPORT OF LABORATORY ANALYSIS**

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# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617082011	EQBL040219	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Sample: BGWC-10	Lab ID:	2617082001	Collecte	ed: 04/02/19	9 16:15	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	thod: EF	PA 3010A			
Arsenic	0.0057	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 17:31	7440-38-2	
Barium	0.045	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 17:31	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 17:31	7440-41-7	
Boron	0.51J	mg/L	1.0	0.026	10	04/09/19 20:29	04/11/19 18:03	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 17:31	7440-43-9	
Calcium	57.8	mg/L	5.0	0.21	10	04/09/19 20:29	04/11/19 18:03	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 17:31	7440-47-3	
Cobalt	0.00027J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 17:31	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 17:31	7439-92-1	
Lithium	0.0012J	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 17:31	7439-93-2	
Molybdenum	0.0032J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 17:31	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 17:31	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 17:31	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	thod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:44	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	355	mg/L	25.0	10.0	1		04/09/19 18:50		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	24.1	mg/L	0.25	0.024	1		04/10/19 04:51	16887-00-6	
Fluoride	0.044J	mg/L	0.30	0.029	1		04/10/19 04:51	16984-48-8	
Sulfate	105	mg/L	10.0	0.17	10		04/10/19 10:34		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Sample: BGWC-30	Lab ID:	2617082002	Collecte	ed: 04/02/19	9 10:24	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00024J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 17:35	7440-38-2	
Barium	0.075	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 17:35	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 17:35	7440-41-7	
Boron	6.1J	mg/L	10.0	0.26	100	04/09/19 20:29	04/11/19 18:06	7440-42-8	
Cadmium	0.000079J	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 17:35	7440-43-9	
Calcium	181	mg/L	50.0	2.1	100	04/09/19 20:29	04/11/19 18:06	7440-70-2	
Chromium	0.00095J	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 17:35	7440-47-3	
Cobalt	0.00022J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 17:35	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 17:35	7439-92-1	
Lithium	0.0041J	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 17:35	7439-93-2	
Molybdenum	0.010	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 17:35	7439-98-7	
Selenium	0.0092J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 17:35	7782-49-2	
Thallium	0.00024J	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 17:35	7440-28-0	
7470 Mercury	Analytical I	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:51	7439-97-6	
2540C Total Dissolved Solids	Analytical I	Method: SM 2	540C						
Total Dissolved Solids	773	mg/L	25.0	10.0	1		04/09/19 18:50		
300.0 IC Anions 28 Days	Analytical I	Method: EPA	300.0						
Chloride	333	mg/L	5.0	0.48	20		04/10/19 10:56	16887-00-6	
Fluoride	0.68	mg/L	0.30	0.029	1		04/10/19 05:12		
Sulfate	153	mg/L	20.0	0.34	20		04/10/19 10:56		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Sample: BGWC-36D	Lab ID:	2617082003	Collecte	ed: 04/02/19	12:10	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00039J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 17:38	7440-38-2	
Barium	0.074	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 17:38	7440-39-3	
Beryllium	0.000070J	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 17:38	7440-41-7	
Boron	6.7J	mg/L	10.0	0.26	100	04/09/19 20:29	04/11/19 18:10	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 17:38	7440-43-9	
Calcium	200	mg/L	50.0	2.1	100	04/09/19 20:29	04/11/19 18:10	7440-70-2	
Chromium	0.0010J	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 17:38	7440-47-3	
Cobalt	0.0011J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 17:38	7440-48-4	
Lead	0.00067J	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 17:38	7439-92-1	
Lithium	0.0021J	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 17:38	7439-93-2	
Molybdenum	0.011	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 17:38	7439-98-7	
Selenium	0.014	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 17:38	7782-49-2	
Thallium	0.00022J	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 17:38	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:53	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	976	mg/L	25.0	10.0	1		04/09/19 18:50		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	378	mg/L	2.5	0.24	10		04/10/19 11:18	16887-00-6	
Fluoride	0.44	mg/L	0.30	0.029	1		04/10/19 05:55	16984-48-8	
Sulfate	192	mg/L	10.0	0.17	10		04/10/19 11:18	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Sample: BGWC-17	Lab ID:	2617082004	Collecte	ed: 04/02/1	9 14:43	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Me	thod: EF	PA 3010A			
Arsenic	0.00024J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 17:42	7440-38-2	
Barium	0.015	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 17:42	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 17:42	7440-41-7	
Boron	0.95J	mg/L	1.0	0.026	10	04/09/19 20:29	04/11/19 18:44	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 17:42	7440-43-9	
Calcium	63.9	mg/L	5.0	0.21	10	04/09/19 20:29	04/11/19 18:44	7440-70-2	
Chromium	0.00044J	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 17:42	7440-47-3	
Cobalt	0.00015J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 17:42	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 17:42	7439-92-1	
Lithium	0.00069J	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 17:42	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 17:42	7439-98-7	
Selenium	0.00077J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 17:42	7782-49-2	
Thallium	0.000075J	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 17:42	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Me	thod: EF	PA 7470A			
Mercury	0.00040	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:55	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	2540C						
Total Dissolved Solids	321	mg/L	25.0	10.0	1		04/09/19 18:51		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	18.7	mg/L	0.25	0.024	1		04/10/19 06:16	16887-00-6	
Fluoride	0.14J	mg/L	0.30	0.029	1		04/10/19 06:16		
Sulfate	86.9	mg/L	10.0	0.17	10		04/10/19 13:08		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Sample: BGWC-18	Lab ID:	2617082005	Collecte	ed: 04/02/19	16:28	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00015J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 20:24	7440-38-2	
Barium	0.028	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 20:24	7440-39-3	
Beryllium	0.000052J	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 20:24	7440-41-7	
Boron	0.56J	mg/L	1.0	0.026	10	04/09/19 20:29	04/11/19 18:47	7440-42-8	
Cadmium	0.000073J	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 20:24	7440-43-9	
Calcium	53.3	mg/L	5.0	0.21	10	04/09/19 20:29	04/11/19 18:47	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 20:24	7440-47-3	
Cobalt	0.00012J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 20:24	7440-48-4	
Lead	0.000081J	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 20:24	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 20:24	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 20:24	7439-98-7	
Selenium	0.0010J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 20:24	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 20:24	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 19:58	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	258	mg/L	25.0	10.0	1		04/09/19 18:51		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	4.5	mg/L	0.25	0.024	1		04/10/19 08:02	16887-00-6	
Fluoride	0.044J	mg/L	0.30	0.029	1		04/10/19 08:02	16984-48-8	
Sulfate	70.1	mg/L	10.0	0.17	10		04/10/19 13:29	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Sample: BGWC-7	Lab ID:	2617082006	Collecte	ed: 04/02/19	9 09:58	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	thod: EF	PA 3010A			
Arsenic	0.0016J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 20:28	7440-38-2	
Barium	0.031	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 20:28	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 20:28	7440-41-7	
Boron	1.4	mg/L	1.0	0.026	10	04/09/19 20:29	04/11/19 18:51	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 20:28	7440-43-9	
Calcium	140	mg/L	10.0	0.41	20	04/09/19 20:29	04/12/19 01:36	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 20:28	7440-47-3	
Cobalt	0.00094J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 20:28	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 20:28	7439-92-1	
Lithium	0.0073J	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 20:28	7439-93-2	
Molybdenum	0.011	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 20:28	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 20:28	7782-49-2	
Thallium	0.000070J	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 20:28	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	thod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 20:00	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	2540C						
Total Dissolved Solids	728	mg/L	25.0	10.0	1		04/09/19 18:51		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	9.4	mg/L	0.25	0.024	1		04/10/19 08:24	16887-00-6	
Fluoride	0.22J	mg/L	0.30	0.029	1		04/10/19 08:24		
Sulfate	334	mg/L	20.0	0.34	20		04/10/19 13:51		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Sample: BGWA-6	Lab ID:	2617082007	Collecte	ed: 04/02/19	9 11:33	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00032J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 20:31	7440-38-2	
Barium	0.011	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 20:31	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 20:31	7440-41-7	
Boron	0.037J	mg/L	0.20	0.0051	2	04/09/19 20:29	04/11/19 18:54	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 20:31	7440-43-9	
Calcium	64.1	mg/L	10.0	0.41	20	04/09/19 20:29	04/12/19 01:40	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 20:31	7440-47-3	
Cobalt	0.00016J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 20:31	7440-48-4	
Lead	0.000070J	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 20:31	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 20:31	7439-93-2	
Molybdenum	0.00026J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 20:31	7439-98-7	
Selenium	0.00031J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 20:31	7782-49-2	
Thallium	0.000062J	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 20:31	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 20:03	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	2540C						
Total Dissolved Solids	295	mg/L	25.0	10.0	1		04/09/19 18:51		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	9.0	mg/L	0.25	0.024	1		04/10/19 08:45	16887-00-6	
Fluoride	ND	mg/L	0.30	0.029	1		04/10/19 08:45	16984-48-8	
Sulfate	29.8	mg/L	1.0	0.017	1		04/10/19 08:45		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Sample: BGWC-16	Lab ID:	2617082008	Collecte	ed: 04/02/19	9 13:22	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00030J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 20:35	7440-38-2	
Barium	0.025	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 20:35	7440-39-3	
Beryllium	0.000063J	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 20:35	7440-41-7	
Boron	1.1	mg/L	1.0	0.026	10	04/09/19 20:29	04/11/19 18:58	7440-42-8	
Cadmium	0.0014	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 20:35	7440-43-9	
Calcium	117	mg/L	10.0	0.41	20	04/09/19 20:29	04/12/19 01:43	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 20:35	7440-47-3	
Cobalt	0.0056J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 20:35	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 20:35	7439-92-1	
Lithium	0.00049J	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 20:35	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 20:35	7439-98-7	
Selenium	0.00060J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 20:35	7782-49-2	
Thallium	0.00020J	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 20:35	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 20:05	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	604	mg/L	25.0	10.0	1		04/09/19 18:51		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	20.3	mg/L	0.25	0.024	1		04/10/19 09:07	16887-00-6	
Fluoride	0.23J	mg/L	0.30	0.029	1		04/10/19 09:07	16984-48-8	
Sulfate	272	mg/L	20.0	0.34	20		04/10/19 14:13		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Sample: Dup-2	Lab ID:	2617082009	Collecte	ed: 04/02/19	00:00	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: Ef	PA 3010A			
Arsenic	0.00012J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 20:39	7440-38-2	В
Barium	0.025	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 20:39	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 20:39	7440-41-7	
Boron	0.49J	mg/L	0.50	0.013	5	04/09/19 20:29	04/11/19 14:51	7440-42-8	M1
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 20:39	7440-43-9	
Calcium	55.8	mg/L	10.0	0.41	20	04/09/19 20:29	04/12/19 01:47	7440-70-2	M6
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 20:39	7440-47-3	
Cobalt	0.00010J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 20:39	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 20:39	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 20:39	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 20:39	7439-98-7	
Selenium	0.00091J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 20:39	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 20:39	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 20:07	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	2540C						
Total Dissolved Solids	262	mg/L	25.0	10.0	1		04/09/19 18:51		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	4.5	mg/L	0.25	0.024	1		04/10/19 09:29	16887-00-6	
Fluoride	0.047J	mg/L	0.30	0.029	1		04/10/19 09:29	16984-48-8	
Sulfate	72.0	mg/L	20.0	0.34	20		04/10/19 14:35	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Sample: FBL040219	Lab ID:	2617082010	Collecte	ed: 04/02/19	9 16:14	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	thod: Ef	PA 3010A			
Arsenic	ND	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/11/19 16:27	7440-38-2	
Barium	0.00011J	mg/L	0.010	0.000060	1	04/09/19 20:29	04/11/19 16:27	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/11/19 16:27	7440-41-7	
Boron	0.0094J	mg/L	0.10	0.0026	1	04/09/19 20:29	04/11/19 16:27	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/11/19 16:27	7440-43-9	
Calcium	ND	mg/L	0.50	0.021	1	04/09/19 20:29	04/11/19 16:27	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/11/19 16:27	7440-47-3	
Cobalt	ND	mg/L	0.010	0.000050	1	04/09/19 20:29	04/11/19 16:27	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/11/19 16:27	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/11/19 16:27	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00010	1	04/09/19 20:29	04/11/19 16:27	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 20:29	04/11/19 16:27	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/11/19 16:27	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	thod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 18:30	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	13.0J	mg/L	25.0	10.0	1		04/09/19 18:52		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	0.088J	mg/L	0.25	0.024	1		04/10/19 09:51	16887-00-6	В
Fluoride	ND	mg/L	0.30	0.029	1		04/10/19 09:51	16984-48-8	
Sulfate	0.051J	mg/L	1.0	0.017	1		04/10/19 09:51		



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Sample: EQBL040219	Lab ID:	2617082011	Collecte	ed: 04/02/19	16:20	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	ND	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/11/19 16:31	7440-38-2	
Barium	0.000076J	mg/L	0.010	0.000060	1	04/09/19 20:29	04/11/19 16:31	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/11/19 16:31	7440-41-7	
Boron	0.0035J	mg/L	0.10	0.0026	1	04/09/19 20:29	04/11/19 16:31	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/11/19 16:31	7440-43-9	
Calcium	ND	mg/L	0.50	0.021	1	04/09/19 20:29	04/11/19 16:31	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/11/19 16:31	7440-47-3	
Cobalt	ND	mg/L	0.010	0.000050	1	04/09/19 20:29	04/11/19 16:31	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/11/19 16:31	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/11/19 16:31	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00010	1	04/09/19 20:29	04/11/19 16:31	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 20:29	04/11/19 16:31	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/11/19 16:31	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 18:32	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	11.0J	mg/L	25.0	10.0	1		04/09/19 18:52		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	0.19J	mg/L	0.25	0.024	1		04/10/19 10:13	16887-00-6	В
Fluoride	ND	mg/L	0.30	0.029	1		04/10/19 10:13	16984-48-8	
Sulfate	0.052J	mg/L	1.0	0.017	1		04/10/19 10:13	14808-79-8	

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### **QUALITY CONTROL DATA**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Mercury

Date: 05/24/2019 11:05 AM

QC Batch: 468366 Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury

Associated Lab Samples: 2617082001, 2617082002, 2617082003, 2617082004, 2617082005, 2617082006, 2617082007, 2617082008,

2617082009

METHOD BLANK: 2544199 Matrix: Water

Associated Lab Samples: 2617082001, 2617082002, 2617082003, 2617082004, 2617082005, 2617082006, 2617082007, 2617082008,

2617082009

mg/L

Blank Reporting Parameter Units MDL Qualifiers Result Limit Analyzed Mercury mg/L ND 0.00020 0.00010 04/11/19 19:03 LABORATORY CONTROL SAMPLE: 2544200 LCS LCS Spike % Rec Parameter Units Conc. Result % Rec Limits Qualifiers 0.0026 106 80-120 Mercury mg/L 0.0025 MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2544201 2544202 MSD MS MSD 2617069003 Spike Spike MS MS MSD % Rec Max Result Result % Rec RPD RPD Parameter Units Result Conc. Conc. % Rec Limits Qual

0.0019

0.0021

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

QC Batch: 468368 Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury

Associated Lab Samples: 2617082010, 2617082011

METHOD BLANK: 2544203 Matrix: Water

Associated Lab Samples: 2617082010, 2617082011

Blank Reporting
Parameter Units Result Limit MDL Analyzed Qualifiers

Mercury mg/L ND 0.00020 0.00010 04/11/19 17:59

LABORATORY CONTROL SAMPLE: 2544204

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury mg/L 0.0025 0.0023 92 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2544205 2544206

MS MSD

MSD 92421822002 Spike Spike MS MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual

Mercury mg/L 0.0024 0.0023 2 25

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

QC Batch: 468328 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET

Associated Lab Samples: 2617082001, 2617082002, 2617082003, 2617082004, 2617082005, 2617082006, 2617082007, 2617082008

METHOD BLANK: 2544084 Matrix: Water

Associated Lab Samples: 2617082001, 2617082002, 2617082003, 2617082004, 2617082005, 2617082006, 2617082007, 2617082008

		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	ND	0.0050	0.000060	04/10/19 16:27	
Barium	mg/L	ND	0.010	0.000060	04/10/19 16:27	
Beryllium	mg/L	ND	0.0030	0.000050	04/10/19 16:27	
Boron	mg/L	ND	0.10	0.0026	04/10/19 16:27	
Cadmium	mg/L	ND	0.0010	0.000070	04/10/19 16:27	
Calcium	mg/L	ND	0.50	0.021	04/10/19 16:27	
Chromium	mg/L	ND	0.010	0.00042	04/10/19 16:27	
Cobalt	mg/L	ND	0.010	0.000050	04/10/19 16:27	
Lead	mg/L	ND	0.0050	0.000050	04/10/19 16:27	
Lithium	mg/L	ND	0.050	0.00042	04/10/19 16:27	
Molybdenum	mg/L	ND	0.010	0.00010	04/10/19 16:27	
Selenium	mg/L	ND	0.010	0.000080	04/10/19 16:27	
Thallium	mg/L	ND	0.0010	0.000060	04/10/19 16:27	

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
senic	mg/L	0.01	0.010	100	80-120	
rium	mg/L	0.05	0.049	99	80-120	
ryllium	mg/L	0.01	0.0090	90	80-120	
ron	mg/L	0.05	0.048J	95	80-120	
dmium	mg/L	0.01	0.010	100	80-120	
lcium	mg/L	0.62	0.62	100	80-120	
omium	mg/L	0.05	0.050	101	80-120	
alt	mg/L	0.01	0.010	101	80-120	
i	mg/L	0.05	0.050	100	80-120	
ium	mg/L	0.05	0.049J	99	80-120	
ybdenum	mg/L	0.05	0.050	101	80-120	
enium	mg/L	0.05	0.050	100	80-120	
allium	mg/L	0.01	0.0099	99	80-120	

MATRIX SPIKE & MATRIX S	PIKE DUPLI	ICATE: 2544	086		2544087							
Parameter	Units	92421822002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec	RPD	Max RPD	Qual
Arsenic	mg/L				0.0099	0.0099				1	20	— Quai
Barium	mg/L				0.060	0.0099				1	20	
Beryllium	mg/L				0.0090	0.0091				1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

MATRIX SPIKE & MATRIX	SPIKE DUPLI	ICATE: 2544	086 MS	MSD	2544087							
		92421822002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Cadmium	mg/L				0.010	0.010				1	20	
Chromium	mg/L				0.049	0.050				1	20	
Cobalt	mg/L				0.0099J	0.010				1	20	
Lead	mg/L				0.049	0.050				2	20	
Lithium	mg/L				0.048J	0.047J				2	20	
Molybdenum	mg/L				0.050	0.050				1	20	
Selenium	mg/L				0.048	0.049				2	20	
Thallium	mg/L				0.0097	0.0099				2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

QC Batch: 468329 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET

Associated Lab Samples: 2617082009, 2617082010, 2617082011

METHOD BLANK: 2544088 Matrix: Water

Associated Lab Samples: 2617082009, 2617082010, 2617082011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	0.000062J	0.0050	0.000060	04/10/19 19:29	
Barium	mg/L	ND	0.010	0.000060	04/10/19 19:29	
Beryllium	mg/L	ND	0.0030	0.000050	04/10/19 19:29	
Boron	mg/L	ND	0.10	0.0026	04/10/19 19:29	
Cadmium	mg/L	ND	0.0010	0.000070	04/10/19 19:29	
Calcium	mg/L	ND	0.50	0.021	04/10/19 19:29	
Chromium	mg/L	ND	0.010	0.00042	04/10/19 19:29	
Cobalt	mg/L	ND	0.010	0.000050	04/10/19 19:29	
Lead	mg/L	ND	0.0050	0.000050	04/10/19 19:29	BC
Lithium	mg/L	ND	0.050	0.00042	04/10/19 19:29	
Molybdenum	mg/L	ND	0.010	0.00010	04/10/19 19:29	
Selenium	mg/L	ND	0.010	0.000080	04/10/19 19:29	
Thallium	mg/L	ND	0.0010	0.000060	04/10/19 19:29	

LABORATORY CONTROL SAMPLE:	2544089					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Arsenic	mg/L	0.01	0.010	103	80-120	
Barium	mg/L	0.05	0.050	99	80-120	
Beryllium	mg/L	0.01	0.0095	95	80-120	
Boron	mg/L	0.05	0.049J	98	80-120	
Cadmium	mg/L	0.01	0.010	102	80-120	
Calcium	mg/L	0.62	0.64	102	80-120	
hromium	mg/L	0.05	0.050	101	80-120	
obalt	mg/L	0.01	0.010	101	80-120	
ead	mg/L	0.05	0.051	101	80-120 E	BC .
thium	mg/L	0.05	0.052	104	80-120	
olybdenum	mg/L	0.05	0.052	103	80-120	
elenium	mg/L	0.05	0.051	102	80-120	
hallium	mg/L	0.01	0.010	101	80-120	

MATRIX SPIKE & MATRIX S	PIKE DUPLI	ICATE: 2544	090		2544091							
Parameter	Units	2617082009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	0.00012J	0.01	0.01	0.0092	0.0091	91	90	75-125	1	20	-
Barium	mg/L	0.025	0.05	0.05	0.068	0.067	87	85	75-125	2	20	
Beryllium	mg/L	ND	0.01	0.01	0.0081	0.0080	80	79	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

MATRIX SPIKE & MATRIX	SPIKE DUPL	ICATE: 2544	090		2544091							
Parameter	Units	2617082009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	mg/L	0.49J	0.05	0.05	0.56	0.58	137	180	75-125	4	20	M1
Cadmium	mg/L	ND	0.01	0.01	0.0091	0.0091	91	90	75-125	0	20	
Calcium	mg/L	55.8	0.62	0.62	54.5	53.7	-203	-330	75-125	1	20	M6
Chromium	mg/L	ND	0.05	0.05	0.045	0.044	89	88	75-125	1	20	
Cobalt	mg/L	0.00010J	0.01	0.01	0.0089J	0.0088J	88	87	75-125	1	20	
Lead	mg/L	ND	0.05	0.05	0.044	0.045	88	90	75-125	2	20	
Lithium	mg/L	ND	0.05	0.05	0.044J	0.044J	89	87	75-125	2	20	
Molybdenum	mg/L	ND	0.05	0.05	0.046	0.046	92	93	75-125	1	20	
Selenium	mg/L	0.00091J	0.05	0.05	0.046	0.045	90	88	75-125	2	20	
Thallium	mg/L	ND	0.01	0.01	0.0088	0.0090	88	90	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

**Total Dissolved Solids** 

Date: 05/24/2019 11:05 AM

QC Batch: 26059 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 2617082001, 2617082002, 2617082003, 2617082004, 2617082005, 2617082006, 2617082007, 2617082008,

2617082009, 2617082010, 2617082011

mg/L

LABORATORY CONTROL SAMPLE:	117667					
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
						— Qualifiers
Total Dissolved Solids	mg/L	400	407	102	84-108	
SAMPLE DUPLICATE: 117668						
		2616931001	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers
Total Dissolved Solids	mg/L	54	0 670	0	21	10 D6
SAMPLE DUPLICATE: 117669						
		2617082006	Dup		Max	
Parameter	Units	Result	Result	RPD	RPD	Qualifiers

728

766

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Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

QC Batch: 26063 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 2617082001, 2617082002, 2617082003, 2617082004, 2617082005, 2617082006, 2617082007, 2617082008,

2617082009, 2617082010, 2617082011

METHOD BLANK: 117675 Matrix: Water

Associated Lab Samples: 2617082001, 2617082002, 2617082003, 2617082004, 2617082005, 2617082006, 2617082007, 2617082008,

2617082009, 2617082010, 2617082011

		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.053J	0.25	0.024	04/09/19 21:23	
Fluoride	mg/L	ND	0.30	0.029	04/09/19 21:23	
Sulfate	mg/L	ND	1.0	0.017	04/09/19 21:23	

LABORATORY CONTROL SAMPLE:	117676					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	10	10.1	101	90-110	
Fluoride	mg/L	10	10.1	101	90-110	
Sulfate	mg/L	10	9.9	99	90-110	

MATRIX SPIKE & MATRIX SP	IKE DUPL	ICATE: 1176	77		117678							
			MS	MSD								
		2617079001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	33.7	10	10	40.3	40.3	65	65	90-110	0	15	M1
Fluoride	mg/L	0.44	10	10	10.2	10.1	97	97	90-110	0	15	
Sulfate	mg/L	255	10	10	178	178	-769	-769	90-110	0	15	E,M1

MATRIX SPIKE SAMPLE:	117679						
		2617079002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	3.8	10	13.4	96	90-110	
Fluoride	mg/L	ND	10	9.9	99	90-110	
Sulfate	mg/L	11.4	10	20.5	91	90-110	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALIFIERS**

Project: Plant Bowen Ash Pond

2617082 Pace Project No.:

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

**RPD - Relative Percent Difference** 

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **LABORATORIES**

PASI-A Pace Analytical Services - Asheville PASI-GA Pace Analytical Services - Atlanta, GA

### ANALYTE QUALIFIERS

Date: 05/24/2019 11:05 AM

В	Analyte was detected in the associated method blank.
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The same analyte was detected in an associated blank at a concentration above 1/2 the reporting limit but below the BC

laboratory reporting limit.

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

Е Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution. M6



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617082

Date: 05/24/2019 11:05 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytica Batch
2617082001	BGWC-10	EPA 3010A	468328	EPA 6020B	468390
2617082002	BGWC-30	EPA 3010A	468328	EPA 6020B	468390
2617082003	BGWC-36D	EPA 3010A	468328	EPA 6020B	468390
2617082004	BGWC-17	EPA 3010A	468328	EPA 6020B	468390
2617082005	BGWC-18	EPA 3010A	468328	EPA 6020B	468390
2617082006	BGWC-7	EPA 3010A	468328	EPA 6020B	468390
2617082007	BGWA-6	EPA 3010A	468328	EPA 6020B	468390
2617082008	BGWC-16	EPA 3010A	468328	EPA 6020B	468390
617082009	Dup-2	EPA 3010A	468329	EPA 6020B	468391
2617082010	FBL040219	EPA 3010A	468329	EPA 6020B	468391
617082011	EQBL040219	EPA 3010A	468329	EPA 6020B	468391
2617082001	BGWC-10	EPA 7470A	468366	EPA 7470A	468612
617082002	BGWC-30	EPA 7470A	468366	EPA 7470A	468612
617082003	BGWC-36D	EPA 7470A	468366	EPA 7470A	468612
617082004	BGWC-17	EPA 7470A	468366	EPA 7470A	468612
2617082005	BGWC-18	EPA 7470A	468366	EPA 7470A	468612
2617082006	BGWC-7	EPA 7470A	468366	EPA 7470A	468612
617082007	BGWA-6	EPA 7470A	468366	EPA 7470A	468612
617082008	BGWC-16	EPA 7470A	468366	EPA 7470A	468612
617082009	Dup-2	EPA 7470A	468366	EPA 7470A	468612
617082010	FBL040219	EPA 7470A	468368	EPA 7470A	468610
2617082011	EQBL040219	EPA 7470A	468368	EPA 7470A	468610
2617082001	BGWC-10	SM 2540C	26059		
617082002	BGWC-30	SM 2540C	26059		
617082003	BGWC-36D	SM 2540C	26059		
617082004	BGWC-17	SM 2540C	26059		
617082005	BGWC-18	SM 2540C	26059		
617082006	BGWC-7	SM 2540C	26059		
617082007	BGWA-6	SM 2540C	26059		
617082008	BGWC-16	SM 2540C	26059		
2617082009	Dup-2	SM 2540C	26059		
2617082010	FBL040219	SM 2540C	26059		
617082011	EQBL040219	SM 2540C	26059		
617082001	BGWC-10	EPA 300.0	26063		
617082002	BGWC-30	EPA 300.0	26063		
617082003	BGWC-36D	EPA 300.0	26063		
617082004	BGWC-17	EPA 300.0	26063		
617082005	BGWC-18	EPA 300.0	26063		
617082006	BGWC-7	EPA 300.0	26063		
617082007	BGWA-6	EPA 300.0	26063		
617082008	BGWC-16	EPA 300.0	26063		
2617082009	Dup-2	EPA 300.0	26063		
2617082010	FBL040219	EPA 300.0	26063		
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	☐ Bubble Wrap ☐ Bubble Ba				
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All containers needing compliance with EPA	preservation are found to be in recommendation.	or es □No □N/A		-   	
		□res ⊒No	Initial when completed	Lot # of added preservative	
Samples checked f	or dechlorination:	□res □No □N/A	14.		
Headspace in VOA	Vials ( >6mm):	□res □No ⊉N/A	15.		
Trip Blank Present:		□res □No ĐN/A	16.		
Trip Blank Custody	Seals Present	□res □No □N/A	1		
Pace Trip Blank Lo	# (if purchased):				
Client Notification	Resolution:			Field Data Require	d? Y / N
	acted:	Date	Time:		
Comments/ Reso					
			-		
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Project Manage	r Review:			Date:	
Note: Whenever the Certification Office ( i.	e is a discrepancy affecting North Cal e out of hold, incorrect preservative,	rolina compliance sa out of temp, incorred	mples, a copy of this fo at containers)	rm will be sent to the Nor	th Carolina DEHNR

F-ALLC003rev.3, 11Septembar 2068 of 28





April 29, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta



(770)734-4200



### **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734

**Arkansas Certification** 

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14

Missouri Certification #: 235

Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457

New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2617084001	BGWC-10	Water	04/02/19 16:15	04/05/19 11:20
2617084002	BGWC-30	Water	04/02/19 10:24	04/05/19 11:20
2617084003	BGWC-36D	Water	04/02/19 12:10	04/05/19 11:20
2617084004	BGWC-17	Water	04/02/19 14:43	04/05/19 11:20
2617084005	BGWC-18	Water	04/02/19 16:28	04/05/19 11:20
2617084006	BGWC-7	Water	04/02/19 09:58	04/05/19 11:20
2617084007	BGWA-6	Water	04/02/19 11:33	04/05/19 11:20
2617084008	BGWC-16	Water	04/02/19 13:22	04/05/19 11:20
2617084009	Dup-2	Water	04/02/19 00:00	04/05/19 11:20
2617084010	FBL040219	Water	04/02/19 16:14	04/05/19 11:20
2617084011	EQBL040219	Water	04/02/19 16:20	04/05/19 11:20



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2617084001	BGWC-10	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617084002	BGWC-30	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617084003	BGWC-36D	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617084004	BGWC-17	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617084005	BGWC-18	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617084006	BGWC-7	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617084007	BGWA-6	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617084008	BGWC-16	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617084009	Dup-2	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617084010	FBL040219	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617084011	EQBL040219	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Sample: BGWC-10 PWS:	<b>Lab ID: 26170840</b> Site ID:	O1 Collected: 04/02/19 16:15 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.459 ± 0.299 (0.464) C:89% T:NA	pCi/L	04/18/19 08:04	13982-63-3	
Radium-228		0.755 ± 0.454 (0.843) C:82% T:71%	pCi/L	04/18/19 15:37	7 15262-20-1	
Total Radium	Total Radium Calculation	1.21 ± 0.753 (1.31)	pCi/L	04/22/19 11:25	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Sample: BGWC-30 PWS:	<b>Lab ID: 26170840</b> Site ID:	O2 Collected: 04/02/19 10:24 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		1.18 ± 0.462 (0.481) C:90% T:NA	pCi/L	04/18/19 08:03	3 13982-63-3	
Radium-228		1.11 ± 0.472 (0.770) C:80% T:82%	pCi/L	04/18/19 15:37	7 15262-20-1	
Total Radium	Total Radium Calculation	2.29 ± 0.934 (1.25)	pCi/L	04/22/19 11:25	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

<b>Sample: BGWC-36D</b> PWS:	<b>Lab ID: 26170840</b> Site ID:	O3 Collected: 04/02/19 12:10 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		1.39 ± 0.524 (0.616) C:91% T:NA	pCi/L	04/18/19 08:03	13982-63-3	
Radium-228		1.42 ± 0.489 (0.648) C:83% T:75%	pCi/L	04/18/19 15:37	7 15262-20-1	
Total Radium	Total Radium Calculation	2.81 ± 1.01 (1.26)	pCi/L	04/22/19 11:25	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Sample: BGWC-17 PWS:	<b>Lab ID: 26170840</b> Site ID:	O4 Collected: 04/02/19 14:43 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.133 ± 0.265 (0.614) C:90% T:NA	pCi/L	04/18/19 08:03	3 13982-63-3	
Radium-228		0.577 ± 0.383 (0.727) C:83% T:77%	pCi/L	04/18/19 15:38	3 15262-20-1	
Total Radium	Total Radium Calculation	0.710 ± 0.648 (1.34)	pCi/L	04/22/19 11:25	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Sample: BGWC-18 PWS:	<b>Lab ID: 26170840</b> Site ID:	05 Collected: 04/02/19 16:28 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.393 ± 0.280 (0.437) C:87% T:NA	pCi/L	04/18/19 08:04	13982-63-3	
Radium-228		0.421 ± 0.322 (0.631) C:85% T:87%	pCi/L	04/18/19 15:37	7 15262-20-1	
Total Radium	Total Radium Calculation	0.814 ± 0.602 (1.07)	pCi/L	04/22/19 11:25	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Sample: BGWC-7 Lab ID: 2617084006 Collected: 04/02/19 09:58 Received: 04/05/19 11:20 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315 0.675 ± 0.403 (0.663) Radium-226 pCi/L 04/18/19 08:03 13982-63-3 C:91% T:NA EPA 9320 0.897 ± 0.389 (0.623) Radium-228 pCi/L 04/18/19 15:37 15262-20-1 C:84% T:86% Total Radium Total Radium 1.57 ± 0.792 (1.29) pCi/L 04/22/19 11:25 7440-14-4 Calculation



Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Sample: BGWA-6 Lab ID: 2617084007 Collected: 04/02/19 11:33 Received: 04/05/19 11:20 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315  $0.0561 \pm 0.221 \quad (0.557)$ Radium-226 pCi/L 04/18/19 08:03 13982-63-3 C:86% T:NA EPA 9320 0.584 ± 0.363 (0.672) Radium-228 pCi/L 04/18/19 15:37 15262-20-1 C:81% T:81% Total Radium Total Radium  $0.640 \pm 0.584$  (1.23) pCi/L 04/22/19 11:25 7440-14-4 Calculation



Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Sample: BGWC-16 PWS:	<b>Lab ID: 26170840</b> 0 Site ID:	O8 Collected: 04/02/19 13:22 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.512 ± 0.329 (0.513) C:87% T:NA	pCi/L	04/18/19 08:03	13982-63-3	
Radium-228		1.22 ± 0.510 (0.807) C:80% T:74%	pCi/L	04/18/19 15:38	3 15262-20-1	
Total Radium	Total Radium Calculation	1.73 ± 0.839 (1.32)	pCi/L	04/22/19 11:25	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Sample: Dup-2 PWS:	<b>Lab ID: 26170840</b> Site ID:	09 Collected: 04/02/19 00:00 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.642 ± 0.325 (0.376) C:91% T:NA	pCi/L	04/18/19 08:03	3 13982-63-3	
Radium-228		0.861 ± 0.454 (0.802) C:79% T:70%	pCi/L	04/18/19 15:37	7 15262-20-1	
Total Radium	Total Radium Calculation	1.50 ± 0.779 (1.18)	pCi/L	04/22/19 11:25	5 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Sample: FBL040219 PWS:	<b>Lab ID: 26170840</b> Site ID:	10 Collected: 04/02/19 16:14 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		-0.157 ± 0.127 (0.517) C:89% T:NA	pCi/L	04/18/19 08:03	13982-63-3	
Radium-228		0.583 ± 0.545 (1.11) C:87% T:84%	pCi/L	04/18/19 19:59	15262-20-1	
Total Radium	Total Radium Calculation	0.583 ± 0.672 (1.63)	pCi/L	04/22/19 11:25	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Sample: EQBL040219 PWS:	<b>Lab ID: 26170840</b> Site ID:	11 Collected: 04/02/19 16:20 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.0972 ± 0.242 (0.579) C:93% T:NA	pCi/L	04/18/19 08:04	13982-63-3	
Radium-228		0.634 ± 0.570 (1.16) C:81% T:85%	pCi/L	04/18/19 19:59	9 15262-20-1	
Total Radium	Total Radium Calculation	0.731 ± 0.812 (1.74)	pCi/L	04/22/19 11:25	7440-14-4	



### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

QC Batch: 337921 Analysis Method: EPA 9315
QC Batch Method: EPA 9315 Analysis Description: 9315 Total Radium

Associated Lab Samples: 2617084001, 2617084002, 2617084003, 2617084004, 2617084005, 2617084006, 2617084007, 2617084008,

2617084009, 2617084010, 2617084011

METHOD BLANK: 1644534 Matrix: Water

Associated Lab Samples: 2617084001, 2617084002, 2617084003, 2617084004, 2617084005, 2617084006, 2617084007, 2617084008,

2617084009, 2617084010, 2617084011

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-226
 0.156 ± 0.184 (0.361) C:97% T:NA
 pCi/L
 04/18/19 09:01

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

QC Batch: 337913 Analysis Method: EPA 9320
QC Batch Method: EPA 9320 Analysis Description: 9320 Radium 228

Associated Lab Samples: 2617084001, 2617084002, 2617084003, 2617084004, 2617084005, 2617084006, 2617084007, 2617084008,

2617084009, 2617084010, 2617084011

METHOD BLANK: 1644523 Matrix: Water

Associated Lab Samples: 2617084001, 2617084002, 2617084003, 2617084004, 2617084005, 2617084006, 2617084007, 2617084008,

2617084009, 2617084010, 2617084011

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.226 ± 0.293 (0.621) C:88% T:75%
 pCi/L
 04/18/19 15:38

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **LABORATORIES**

Date: 04/29/2019 03:32 PM

PASI-PA Pace Analytical Services - Greensburg



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617084

Date: 04/29/2019 03:32 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2617084001	BGWC-10	EPA 9315	337921		
2617084002	BGWC-30	EPA 9315	337921		
2617084003	BGWC-36D	EPA 9315	337921		
2617084004	BGWC-17	EPA 9315	337921		
2617084005	BGWC-18	EPA 9315	337921		
2617084006	BGWC-7	EPA 9315	337921		
2617084007	BGWA-6	EPA 9315	337921		
2617084008	BGWC-16	EPA 9315	337921		
2617084009	Dup-2	EPA 9315	337921		
2617084010	FBL040219	EPA 9315	337921		
2617084011	EQBL040219	EPA 9315	337921		
2617084001	BGWC-10	EPA 9320	337913		
2617084002	BGWC-30	EPA 9320	337913		
2617084003	BGWC-36D	EPA 9320	337913		
2617084004	BGWC-17	EPA 9320	337913		
2617084005	BGWC-18	EPA 9320	337913		
2617084006	BGWC-7	EPA 9320	337913		
2617084007	BGWA-6	EPA 9320	337913		
2617084008	BGWC-16	EPA 9320	337913		
2617084009	Dup-2	EPA 9320	337913		
2617084010	FBL040219	EPA 9320	337913		
2617084011	EQBL040219	EPA 9320	337913		
2617084001	BGWC-10	Total Radium Calculation	339292		
2617084002	BGWC-30	Total Radium Calculation	339292		
2617084003	BGWC-36D	Total Radium Calculation	339292		
2617084004	BGWC-17	Total Radium Calculation	339292		
2617084005	BGWC-18	Total Radium Calculation	339292		
2617084006	BGWC-7	Total Radium Calculation	339292		
2617084007	BGWA-6	Total Radium Calculation	339292		
2617084008	BGWC-16	Total Radium Calculation	339292		
2617084009	Dup-2	Total Radium Calculation	339292		
2617084010	FBL040219	Total Radium Calculation	339292		
2617084011	EQBL040219	Total Radium Calculation	339292		



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Page: Of		Domitation Angelow	Curaty (Managor	State / Location	AD.				(	N/A) i	orito	il Cur	mpise												+09/T07·#0			2617084	E TIME SAMPLE CONDITIONS	0 to 3	1	-		+	uo	EMP in (MV)	<b>車の ○○%の ○ ※ ▼</b>	
утайол:		ате		İ	Manager: DetSY.Mcdaniei@paceiaus.com.	8 #: 315   Roguested Analysis Filtered (YM)	L	Preservatives >	72		.αq/	у <b>зе</b> 920 4 020 74747	103	3 3 4 0 2 2 X X X	Z X X X	× × ×	,	2 × × × × × × × × × × × × × × × × × × ×	X X X X	\frac{1}{2}		1	× × ×	X   X   X   X   X   X   X   X   X   X	N X X X	XXXX	34 37 34		ACCEPTED BY / AFFILIATION DATE	(c)     X	3217		Magninan 415			Cathery Contract	4/2/19	
Section C Invoice Information:			Address:		Plant Bowen Ash Pond Pace Project Manager	Pace Profile #:		1	NOIT:	OFFE	_	INIAT	ECON WELET	<u>^</u>	1 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1,53	1 2 2 2 2 2 2 1	4 2 19 19 19 19 19 19	7 7	1000	7 2 19 10 25 2	4/2/19 1133 111	H/2/19 17422 H	510	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		7701 515	DET INCOMMENTALY APPRICATION DATE THAT		BOS-(UR				SAMPLER NAME AND SIGNATURE	PRINT Namo of SAMPLER:		
Section B Recuired Project Information:	Γ	Copy To:	Whitney Law	Purchase Order #: SC	Fax: Plant B	Project #:		(lîsi o	200 200 200 200 200 200 200 200 200 200	Water WT CO Waster Way D WASTE WATER OF THE PROPERTY OF THE PR	<del>ශ</del> ෝ න් ප්	Wipe Ar AR	Other Tissue	+-1	3	3		360 BG	J \4,	Vs	, , ,	<u> </u>	J 72,	73	3	7	5 ×	3				<b>&gt;</b>						
Section A	Company Georgia Power - Coal Compustion Residuals	Address: 2480 Maner Road		25		Requested Due Date:					SAMPLE II	Ono Character per box	Sample Ids must be unique	311	C1- 2C. 2C		2 - 150000	3 Beach 36		┿	01-07-081-9	1 - DCDCDC 9	7 Richard 6	)	+		10 10 10 10 10 10 10 10 10 10 10 10 10 1	11 TECBIO-01021G	12	SO THE ROLL OF THE PARTY OF THE	App. IV Parameters: As, Ba, Bc, Cd, Co, Cr, Hg, Li, Mo, Pb, Se, Tl Ontyl			F	Page	e 20 c	of 21	I

- week	Sample	Condition	opon Keceipi	i	
Pace Analys	tical Client Name:	GCA 1	Powere	Project #	
Tracking #:	UPS USPS Client Coler/Box Present: Vyes	Commercial	Pace Other	WO# : 26 PM: BM CLIENT: GAPON	Due Date: 05/03/
				CLIENI: GHIOR	
Packing Material:	Bubble Wrap Bubble Bags	None [	Other		
Thermometer Used		e of Ice: Wet			ing process has begun
Cooler Temperatur	e	ogical Tissue i	s Frozen: Yes No	contents: 4	
Temp should be above	freezing to 6°C		Comments:		
Chain of Custody Pr	esent:	s ONO ON/A	1	1	
Chain of Custody Fil	led Out:	S ONO ON/A	2.		
Chain of Custody Re	linquished:	7es □No □N/A	3.		
Sampler Name & Si	gnature on COC:	7€s □No □N/A	4.		
Samples Arrived wit	hin Hold Time:	YES NO NA	5.		
Short Hold Time A	nalysis (<72hr):	Yes DHO DN/A	6.		
Rush Turn Around	Time Requested:	Yes DINO DIN/A	7.		
Sufficient Volume:	<b></b>	Yes □No □N/A	8.		
Correct Containers	Used:	9es □No □N/A	9.		
-Pace Containers	s Used:	Tes □no □n/A			
Containers Intact:		es □No □N/A	10.		
Filtered volume reco	eived for Dissolved tests	Yes □No -ŪN/A	11.		
Sample Labels mate		es □No □N/A			
-Includes date/tii		$\omega$			
	preservation have been checked	Yes □No □N/A	13		
All containers needing compliance with EPA	preservation are found to be in	Yes □No □N/A			
		Yes 🗗 No	Initial when completed	Lot # of added preservative	
Samples checked for	or dechlorination:	Yes □No ☑N/7A	14.		
Headspace in VOA	Vials ( >6mm): □	Yes □No ☑NA	15.	:	
Trip Blank Present:		res 🗆 No 🗗 NIA	16.		
Trip Blank Custody	Seals Present	res 🗆 No 🗖 🗖 A	1		
Pace Trip Blank Lo	# (if purchased):				
Client Notification	Resolution			Field Data Require	1? Y / N
	acted:	Date/	Time:	Data rioquita	. , ,
Comments/ Reso					
			<del></del>		
			- community		
Project Manage	r Review:			Date:	
	re is a discrepancy affecting North Caro le out of hold, incorrect preservative, or			rm will be sent to the Nor	th Carolina DEHNR

F-ALLCOD3rev.3, 11September 2026 of 21





May 03, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This revised report replaces the one issued on 4/15/2019. The report has been revised to correct metals units and target list per consultant request. No other changes have been made to this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton Moamed

betsy.mcdaniel@pacelabs.com

(770)734-4200

Project Manager

**Enclosures** 

cc: Whitney Law, Geosyntec Consultants
Noelia Muskus, Geosyntec Consultants
Rebecca Thornton, Pace Analytical Atlanta





### **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

**Atlanta Certification IDs** 

110 Technology Parkway Peachtree Corners, GA 30092

Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001

Virginia Certification #: 460204

**Asheville Certification IDs** 

2225 Riverside Drive, Asheville, NC 28804 Florida/NELAP Certification #: E87648 Massachusetts Certification #: M-NC030

North Carolina Drinking Water Certification #: 37712

North Carolina Wastewater Certification #: 40 South Carolina Certification #: 99030001 Virginia/VELAP Certification #: 460222



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2617086001	BGWA-2	Water	04/01/19 10:39	04/05/19 11:20
2617086002	BGWA-29	Water	04/01/19 10:55	04/05/19 11:20
2617086003	BGWC-8	Water	04/01/19 12:36	04/05/19 11:20
2617086004	BGWC-9	Water	04/01/19 14:02	04/05/19 11:20
2617086005	BGWC-12	Water	04/01/19 15:12	04/05/19 11:20
2617086006	Dup-1	Water	04/01/19 00:00	04/05/19 11:20



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2617086001	BGWA-2	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617086002	BGWA-29	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617086003	BGWC-8	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617086004	BGWC-9	EPA 6020B	JMW1, SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617086005	BGWC-12	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA
2617086006	Dup-1	EPA 6020B	SER	13	PASI-A
		EPA 7470A	RDT	1	PASI-A
		SM 2540C	RLC	1	PASI-GA
		EPA 300.0	RLC	3	PASI-GA



Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Date: 05/03/2019 10:28 AM

Sample: BGWA-2	Lab ID:	2617086001	Collecte	ed: 04/01/1	9 10:39	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Me	thod: EF	PA 3010A			
Arsenic	0.00049J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/11/19 16:34	7440-38-2	В
Barium	0.16	mg/L	0.010	0.000060	1	04/09/19 20:29	04/11/19 16:34	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/11/19 16:34	7440-41-7	
Boron	0.0076J	mg/L	0.10	0.0026	1	04/09/19 20:29	04/11/19 16:34	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/11/19 16:34	7440-43-9	
Calcium	48.2	mg/L	2.5	0.10	5	04/09/19 20:29	04/11/19 16:38	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/11/19 16:34	7440-47-3	
Cobalt	0.00014J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/11/19 16:34	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/11/19 16:34	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/11/19 16:34	7439-93-2	
Molybdenum	0.0014J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/11/19 16:34	7439-98-7	
Selenium	0.00011J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/11/19 16:34	7782-49-2	
Thallium	0.00011J	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/11/19 16:34	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	thod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 18:35	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	2540C						
Total Dissolved Solids	226	mg/L	25.0	10.0	1		04/08/19 15:23		D6
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	4.2	mg/L	0.25	0.024	1		04/10/19 02:13	16887-00-6	
Fluoride	0.047J	mg/L	0.30	0.029	1		04/10/19 02:13	16984-48-8	
Sulfate	10.8	mg/L	1.0	0.017	1		04/10/19 02:13		M1



Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Date: 05/03/2019 10:28 AM

Sample: BGWA-29	Lab ID:	2617086002	Collecte	ed: 04/01/19	10:55	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00019J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/11/19 16:41	7440-38-2	В
Barium	0.014	mg/L	0.010	0.000060	1	04/09/19 20:29	04/11/19 16:41	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/11/19 16:41	7440-41-7	
Boron	0.0048J	mg/L	0.10	0.0026	1	04/09/19 20:29	04/11/19 16:41	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/11/19 16:41	7440-43-9	
Calcium	24.6	mg/L	2.5	0.10	5	04/09/19 20:29	04/11/19 16:45	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/11/19 16:41	7440-47-3	
Cobalt	ND	mg/L	0.010	0.000050	1	04/09/19 20:29	04/11/19 16:41	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/11/19 16:41	7439-92-1	
Lithium	0.00059J	mg/L	0.050	0.00042	1	04/09/19 20:29	04/11/19 16:41	7439-93-2	
Molybdenum	0.00053J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/11/19 16:41	7439-98-7	
Selenium	ND	mg/L	0.010	0.000080	1	04/09/19 20:29	04/11/19 16:41	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/11/19 16:41	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 18:37	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	114	mg/L	25.0	10.0	1		04/08/19 15:25		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	1.6	mg/L	0.25	0.024	1		04/10/19 03:23	16887-00-6	
Fluoride	ND	mg/L	0.30	0.029	1		04/10/19 03:23	16984-48-8	
Sulfate	5.2	mg/L	1.0	0.017	1		04/10/19 03:23	14808-79-8	M1



Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Date: 05/03/2019 10:28 AM

Sample: BGWC-8	Lab ID:	2617086003	Collecte	ed: 04/01/1	9 12:36	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Me	thod: Ef	PA 3010A			
Arsenic	0.00041J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/11/19 16:55	7440-38-2	В
Barium	0.025	mg/L	0.010	0.000060	1	04/09/19 20:29	04/11/19 16:55	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/11/19 16:55	7440-41-7	
Boron	0.046J	mg/L	0.10	0.0026	1	04/09/19 20:29	04/11/19 16:55	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/11/19 16:55	7440-43-9	
Calcium	47.2	mg/L	2.5	0.10	5	04/09/19 20:29	04/11/19 16:59	7440-70-2	
Chromium	0.00091J	mg/L	0.010	0.00042	1	04/09/19 20:29	04/11/19 16:55	7440-47-3	
Cobalt	0.000056J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/11/19 16:55	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/11/19 16:55	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/11/19 16:55	7439-93-2	
Molybdenum	0.00054J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/11/19 16:55	7439-98-7	
Selenium	0.00015J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/11/19 16:55	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/11/19 16:55	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	thod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 18:39	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	191	mg/L	25.0	10.0	1		04/08/19 15:25		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	1.8	mg/L	0.25	0.024	1		04/10/19 03:46	16887-00-6	
Fluoride	ND	mg/L	0.30	0.029	1		04/10/19 03:46	16984-48-8	
Sulfate	30.5	mg/L	1.0	0.017	1		04/10/19 03:46	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Date: 05/03/2019 10:28 AM

Sample: BGWC-9	Lab ID:	2617086004	Collecte	ed: 04/01/19	9 14:02	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.0026J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 21:21	7440-38-2	
Barium	0.027	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 21:21	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 21:21	7440-41-7	
Boron	0.50	mg/L	0.50	0.013	5	04/09/19 20:29	04/11/19 17:03	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 21:21	7440-43-9	
Calcium	59.3	mg/L	10.0	0.41	20	04/09/19 20:29	04/12/19 02:26	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 21:21	7440-47-3	
Cobalt	0.00024J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 21:21	7440-48-4	
Lead	0.000092J	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 21:21	7439-92-1	
Lithium	0.0012J	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 21:21	7439-93-2	
Molybdenum	0.0027J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 21:21	7439-98-7	
Selenium	0.00040J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 21:21	7782-49-2	
Thallium	0.000065J	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 21:21	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 18:42	7439-97-6	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	326	mg/L	25.0	10.0	1		04/08/19 15:26		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	13.4	mg/L	0.25	0.024	1		04/10/19 04:09	16887-00-6	
Fluoride	0.33	mg/L	0.30	0.029	1		04/10/19 04:09	16984-48-8	
Sulfate	81.4	mg/L	10.0	0.17	10		04/10/19 09:57	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Date: 05/03/2019 10:28 AM

Sample: BGWC-12	Lab ID:	2617086005	Collecte	ed: 04/01/19	15:12	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6020 MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00028J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/10/19 21:25	7440-38-2	В
Barium	0.023	mg/L	0.010	0.000060	1	04/09/19 20:29	04/10/19 21:25	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/10/19 21:25	7440-41-7	
Boron	0.86J	mg/L	1.0	0.026	10	04/09/19 20:29	04/11/19 17:06	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/10/19 21:25	7440-43-9	
Calcium	94.8	mg/L	5.0	0.21	10	04/09/19 20:29	04/11/19 17:06	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/10/19 21:25	7440-47-3	
Cobalt	0.00034J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/10/19 21:25	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/10/19 21:25	7439-92-1	
Lithium	0.00078J	mg/L	0.050	0.00042	1	04/09/19 20:29	04/10/19 21:25	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00010	1	04/09/19 20:29	04/10/19 21:25	7439-98-7	
Selenium	0.00040J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/10/19 21:25	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/10/19 21:25	7440-28-0	
7470 Mercury	Analytical I	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 18:44	7439-97-6	
2540C Total Dissolved Solids	Analytical I	Method: SM 2	540C						
Total Dissolved Solids	191	mg/L	25.0	10.0	1		04/08/19 15:27		
300.0 IC Anions 28 Days	Analytical I	Method: EPA	300.0						
Chloride	24.1	mg/L	0.25	0.024	1		04/10/19 04:32	16887-00-6	
Fluoride	0.065J	mg/L	0.30	0.029	1		04/10/19 04:32	16984-48-8	
Sulfate	239	mg/L	20.0	0.34	20		04/10/19 10:20	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Date: 05/03/2019 10:28 AM

Sample: Dup-1	Lab ID:	2617086006	Collecte	ed: 04/01/19	9 00:00	Received: 04/	05/19 11:20 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical I	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3010A			
Arsenic	0.00048J	mg/L	0.0050	0.000060	1	04/09/19 20:29	04/11/19 17:10	7440-38-2	В
Barium	0.16	mg/L	0.010	0.000060	1	04/09/19 20:29	04/11/19 17:10	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000050	1	04/09/19 20:29	04/11/19 17:10	7440-41-7	
Boron	0.013J	mg/L	0.10	0.0026	1	04/09/19 20:29	04/11/19 17:10	7440-42-8	
Cadmium	ND	mg/L	0.0010	0.000070	1	04/09/19 20:29	04/11/19 17:10	7440-43-9	
Calcium	46.7	mg/L	2.5	0.10	5	04/09/19 20:29	04/11/19 17:13	7440-70-2	
Chromium	ND	mg/L	0.010	0.00042	1	04/09/19 20:29	04/11/19 17:10	7440-47-3	
Cobalt	0.00014J	mg/L	0.010	0.000050	1	04/09/19 20:29	04/11/19 17:10	7440-48-4	
Lead	ND	mg/L	0.0050	0.000050	1	04/09/19 20:29	04/11/19 17:10	7439-92-1	
Lithium	ND	mg/L	0.050	0.00042	1	04/09/19 20:29	04/11/19 17:10	7439-93-2	
Molybdenum	0.0014J	mg/L	0.010	0.00010	1	04/09/19 20:29	04/11/19 17:10	7439-98-7	
Selenium	0.00011J	mg/L	0.010	0.000080	1	04/09/19 20:29	04/11/19 17:10	7782-49-2	
Thallium	0.00011J	mg/L	0.0010	0.000060	1	04/09/19 20:29	04/11/19 17:10	7440-28-0	
7470 Mercury	Analytical I	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00020	0.00010	1	04/10/19 12:38	04/11/19 18:47	7439-97-6	
2540C Total Dissolved Solids	Analytical I	Method: SM 2	540C						
Total Dissolved Solids	178	mg/L	25.0	10.0	1		04/08/19 15:28		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	4.2	mg/L	0.25	0.024	1		04/10/19 04:55	16887-00-6	
Fluoride	0.21J	mg/L	0.30	0.029	1		04/10/19 04:55	16984-48-8	
Sulfate	10.9	mg/L	1.0	0.017	1		04/10/19 04:55	14808-79-8	

2 25



### **QUALITY CONTROL DATA**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Mercury

Date: 05/03/2019 10:28 AM

QC Batch: 468368 Analysis Method: EPA 7470A

QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury

Associated Lab Samples: 2617086001, 2617086002, 2617086003, 2617086004, 2617086005, 2617086006

METHOD BLANK: 2544203 Matrix: Water

Associated Lab Samples: 2617086001, 2617086002, 2617086003, 2617086004, 2617086005, 2617086006

Blank Reporting

 Parameter
 Units
 Result
 Limit
 MDL
 Analyzed
 Qualifiers

 Mercury
 mg/L
 ND
 0.00020
 0.00010
 04/11/19 17:59

LABORATORY CONTROL SAMPLE: 2544204

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Mercury mg/L 0.0025 0.0023 92 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2544205 2544206

mg/L

MS MSD 92421822002 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual

0.0024

0.0023

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Date: 05/03/2019 10:28 AM

QC Batch: 468329 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET

Associated Lab Samples: 2617086001, 2617086002, 2617086003, 2617086004, 2617086005, 2617086006

METHOD BLANK: 2544088 Matrix: Water

Associated Lab Samples: 2617086001, 2617086002, 2617086003, 2617086004, 2617086005, 2617086006

		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	0.000062J	0.0050	0.000060	04/10/19 19:29	
Barium	mg/L	ND	0.010	0.000060	04/10/19 19:29	
Beryllium	mg/L	ND	0.0030	0.000050	04/10/19 19:29	
Boron	mg/L	ND	0.10	0.0026	04/10/19 19:29	
Cadmium	mg/L	ND	0.0010	0.000070	04/10/19 19:29	
Calcium	mg/L	ND	0.50	0.021	04/10/19 19:29	
Chromium	mg/L	ND	0.010	0.00042	04/10/19 19:29	
Cobalt	mg/L	ND	0.010	0.000050	04/10/19 19:29	
Lead	mg/L	ND	0.0050	0.000050	04/10/19 19:29	BC
Lithium	mg/L	ND	0.050	0.00042	04/10/19 19:29	
Molybdenum	mg/L	ND	0.010	0.00010	04/10/19 19:29	
Selenium	mg/L	ND	0.010	0.000080	04/10/19 19:29	
Thallium	mg/L	ND	0.0010	0.000060	04/10/19 19:29	

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Arsenic	mg/L	0.01	0.010	103	80-120	
Barium	mg/L	0.05	0.050	99	80-120	
Beryllium	mg/L	0.01	0.0095	95	80-120	
Boron	mg/L	0.05	0.049J	98	80-120	
Cadmium	mg/L	0.01	0.010	102	80-120	
Calcium	mg/L	0.62	0.64	102	80-120	
Chromium	mg/L	0.05	0.050	101	80-120	
Cobalt	mg/L	0.01	0.010	101	80-120	
Lead	mg/L	0.05	0.051	101	80-120 B	С
Lithium	mg/L	0.05	0.052	104	80-120	
Molybdenum	mg/L	0.05	0.052	103	80-120	
Selenium	mg/L	0.05	0.051	102	80-120	
Thallium	mg/L	0.01	0.010	101	80-120	

MATRIX SPIKE & MATRIX SPIK	E DUPLIC	CATE: 25440	90		2544091							
			MS	MSD								
		2617082009	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Arsenic	mg/L	0.00012J	0.01	0.01	0.0092	0.0091	91	90	75-125	1	20	
Barium	mg/L	0.025	0.05	0.05	0.068	0.067	87	85	75-125	2	20	
Beryllium	mg/L	ND	0.01	0.01	0.0081	0.0080	80	79	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Date: 05/03/2019 10:28 AM

MATRIX SPIKE & MATRIX S	SPIKE DUPLIC	ATE: 254409	90		2544091							
Parameter	Units	2617082009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	mg/L	0.49J	0.05	0.05	0.56	0.58	137	180	75-125	4	20	M1
Cadmium	mg/L	ND	0.01	0.01	0.0091	0.0091	91	90	75-125	0	20	
Calcium	mg/L	55.8	0.62	0.62	54.5	53.7	-203	-330	75-125	1	20	M6
Chromium	mg/L	ND	0.05	0.05	0.045	0.044	89	88	75-125	1	20	
Cobalt	mg/L	0.00010J	0.01	0.01	0.0089J	0.0088J	88	87	75-125	1	20	
Lead	mg/L	ND	0.05	0.05	0.044	0.045	88	90	75-125	2	20	
Lithium	mg/L	ND	0.05	0.05	0.044J	0.044J	89	87	75-125	2	20	
Molybdenum	mg/L	ND	0.05	0.05	0.046	0.046	92	93	75-125	1	20	
Selenium	mg/L	0.00091J	0.05	0.05	0.046	0.045	90	88	75-125	2	20	
Thallium	mg/L	ND	0.01	0.01	0.0088	0.0090	88	90	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

QC Batch: 25999 Analysis Method: SM 2540C

QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 2617086001, 2617086002, 2617086003, 2617086004, 2617086005, 2617086006

LABORATORY CONTROL SAMPLE: 117377

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Total Dissolved Solids** mg/L 400 411 103 84-108

SAMPLE DUPLICATE: 117378

2617086001 Dup Max RPD RPD Qualifiers Units Parameter Result Result **Total Dissolved Solids** 226 203 11 10 D6 mg/L

SAMPLE DUPLICATE: 117379

Date: 05/03/2019 10:28 AM

Parameter Units Result RPD Max Result RPD Qualifiers

Total Dissolved Solids mg/L ND 13.0J 10

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Date: 05/03/2019 10:28 AM

 QC Batch:
 26064
 Analysis Method:
 EPA 300.0

 QC Batch Method:
 EPA 300.0
 Analysis Description:
 300.0 IC Anions

 Associated Lab Samples:
 2617086001, 2617086002, 2617086003, 2617086004, 2617086005, 2617086006

METHOD BLANK: 117680 Matrix: Water

Associated Lab Samples: 2617086001, 2617086002, 2617086003, 2617086004, 2617086005, 2617086006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	0.25	0.024	04/10/19 01:27	
Fluoride	mg/L	ND	0.30	0.029	04/10/19 01:27	
Sulfate	mg/L	ND	1.0	0.017	04/10/19 01:27	

LABORATORY CONTROL SAMPLE:	117681					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	10	10.1	101	90-110	
Fluoride	mg/L	10	10.2	102	90-110	
Sulfate	mg/L	10	10.1	101	90-110	

MATRIX SPIKE & MATRIX SPIK	E DUPLIC	CATE: 117682	2		117683							
			MS	MSD								
		2617086001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	4.2	10	10	14.3	14.3	101	101	90-110	0	15	
Fluoride	mg/L	0.047J	10	10	10.4	10.4	103	103	90-110	0	15	
Sulfate	mg/L	10.8	10	10	19.6	19.6	89	88	90-110	0	15	M1

MATRIX SPIKE SAMPLE:	117684						
Parameter	Units	2617086002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	1.6	10	10.7	91	90-110	_
Fluoride	mg/L	ND	10	9.2	92	90-110	
Sulfate	mg/L	5.2	10	13.7	85	90-110 N	<i>I</i> 11

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALIFIERS**

Project: Plant Bowen Ash Pond

2617086 Pace Project No.:

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **LABORATORIES**

PASI-A Pace Analytical Services - Asheville PASI-GA Pace Analytical Services - Atlanta, GA

### ANALYTE QUALIFIERS

Date: 05/03/2019 10:28 AM

В Analyte was detected in the associated method blank.

The same analyte was detected in an associated blank at a concentration above 1/2 the reporting limit but below the BC

laboratory reporting limit.

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617086

Date: 05/03/2019 10:28 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2617086001	BGWA-2	EPA 3010A	468329	EPA 6020B	468391
2617086002	BGWA-29	EPA 3010A	468329	EPA 6020B	468391
2617086003	BGWC-8	EPA 3010A	468329	EPA 6020B	468391
2617086004	BGWC-9	EPA 3010A	468329	EPA 6020B	468391
2617086005	BGWC-12	EPA 3010A	468329	EPA 6020B	468391
2617086006	Dup-1	EPA 3010A	468329	EPA 6020B	468391
2617086001	BGWA-2	EPA 7470A	468368	EPA 7470A	468610
2617086002	BGWA-29	EPA 7470A	468368	EPA 7470A	468610
2617086003	BGWC-8	EPA 7470A	468368	EPA 7470A	468610
2617086004	BGWC-9	EPA 7470A	468368	EPA 7470A	468610
2617086005	BGWC-12	EPA 7470A	468368	EPA 7470A	468610
2617086006	Dup-1	EPA 7470A	468368	EPA 7470A	468610
2617086001	BGWA-2	SM 2540C	25999		
2617086002	BGWA-29	SM 2540C	25999		
2617086003	BGWC-8	SM 2540C	25999		
2617086004	BGWC-9	SM 2540C	25999		
2617086005	BGWC-12	SM 2540C	25999		
2617086006	Dup-1	SM 2540C	25999		
2617086001	BGWA-2	EPA 300.0	26064		
2617086002	BGWA-29	EPA 300.0	26064		
2617086003	BGWC-8	EPA 300.0	26064		
2617086004	BGWC-9	EPA 300.0	26064		
2617086005	BGWC-12	EPA 300.0	26064		
2617086006	Dup-1	EPA 300.0	26064		



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Custody Seal on C	ooler/Box Present: yes		no Seals	intact: yes	CLIENT: GAP	k :
Packing Material:	Bubble Wrap Bubble I	Bags	None	Other	<u>.</u>	
Thermometer Used	83	Тур	e of Ice: Wet	Blue None		ling process has begun
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April 29, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on April 05, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton M Damil

betsy.mcdaniel@pacelabs.com

(770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Rebecca Thornton, Pace Analytical Atlanta



(770)734-4200



**CERTIFICATIONS** 

Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590 Arizona Certification #: AZ0734 Arkansas Certification

California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694

Delaware Certification EPA Region 4 DW Rad

Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET

Guam Certification Hawaii Certification Idaho Certification Illinois Certification Indiana Certification Iowa Certification #: 391

Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020 Maryland Certification #: 308

Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051

New Jersey TNI Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249

Missouri Certification #: 235

Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282

South Dakota Certification
Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2617087001	BGWA-2	Water	04/01/19 10:39	04/05/19 11:20
2617087002	BGWA-29	Water	04/01/19 10:55	04/05/19 11:20
2617087003	BGWC-8	Water	04/01/19 12:36	04/05/19 11:20
2617087004	BGWC-9	Water	04/01/19 14:02	04/05/19 11:20
2617087005	BGWC-12	Water	04/01/19 15:12	04/05/19 11:20
2617087006	Dup-1	Water	04/01/19 00:00	04/05/19 11:20



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2617087001	BGWA-2	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617087002	BGWA-29	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617087003	BGWC-8	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617087004	BGWC-9	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617087005	BGWC-12	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2617087006	Dup-1	EPA 9315	LAL	1	PASI-PA
		EPA 9320	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

Sample: BGWA-2 PWS:	<b>Lab ID: 26170870</b> Site ID:	O1 Collected: 04/01/19 10:39 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.616 ± 0.315 (0.349) C:88% T:NA	pCi/L	04/18/19 09:0	13982-63-3	
Radium-228		0.820 ± 0.620 (1.22) C:80% T:76%	pCi/L	04/18/19 18:08	3 15262-20-1	
Total Radium	Total Radium Calculation	1.44 ± 0.935 (1.57)	pCi/L	04/22/19 11:25	7440-14-4	



Project: Plant Bowen Ash Pond

Calculation

Pace Project No.: 2617087

Sample: BGWA-29 Lab ID: 2617087002 Collected: 04/01/19 10:55 Received: 04/05/19 11:20 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315  $0.0932 \pm 0.225 \quad (0.535)$ Radium-226 pCi/L 04/18/19 09:01 13982-63-3 C:89% T:NA EPA 9320  $0.567 \pm 0.500 \quad (1.01)$ Radium-228 pCi/L 04/18/19 18:11 15262-20-1 C:86% T:79% Total Radium Total Radium  $0.660 \pm 0.725 \quad (1.55)$ pCi/L 04/22/19 11:25 7440-14-4



Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

Sample: BGWC-8 PWS:	<b>Lab ID: 26170870</b> Site ID:	O3 Collected: 04/01/19 12:36 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.326 ± 0.265 (0.451) C:82% T:NA	pCi/L	04/18/19 09:0	13982-63-3	
Radium-228		0.148 ± 0.449 (1.01) C:84% T:82%	pCi/L	04/18/19 18:20	15262-20-1	
Total Radium	Total Radium Calculation	0.474 ± 0.714 (1.46)	pCi/L	04/22/19 11:25	7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

Sample: BGWC-9 PWS:	<b>Lab ID: 26170870</b> Site ID:	O4 Collected: 04/01/19 14:02 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226		0.225 ± 0.210 (0.369) C:94% T:NA	pCi/L	04/18/19 09:0	1 13982-63-3	
Radium-228		-0.216 ± 0.398 (0.985) C:83% T:80%	pCi/L	04/18/19 18:19	9 15262-20-1	
Total Radium	Total Radium Calculation	0.225 ± 0.608 (1.35)	pCi/L	04/22/19 11:25	5 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

Sample: BGWC-12 PWS:	<b>Lab ID: 26170870</b> Site ID:	O05 Collected: 04/01/19 15:12 Sample Type:	Received:	04/05/19 11:20	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.328 ± 0.252 (0.422) C:95% T:NA	pCi/L	04/18/19 09:0	1 13982-63-3	
Radium-228	EPA 9320	-0.347 ± 0.447 (1.12) C:84% T:76%	pCi/L	04/18/19 18:19	9 15262-20-1	
Total Radium	Total Radium Calculation	0.328 ± 0.699 (1.54)	pCi/L	04/22/19 11:25	5 7440-14-4	



Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

Sample: Dup-1 Lab ID: 2617087006 Collected: 04/01/19 00:00 Received: 04/05/19 11:20 Matrix: Water PWS: Site ID: Sample Type: Act ± Unc (MDC) Carr Trac **Parameters** Method Units Analyzed CAS No. Qual EPA 9315  $0.668 \pm 0.322 \quad (0.346)$ Radium-226 pCi/L 04/18/19 09:01 13982-63-3 C:92% T:NA EPA 9320 0.831 ± 0.398 (0.684) Radium-228 pCi/L 04/18/19 15:36 15262-20-1 C:80% T:92% Total Radium Total Radium  $1.50 \pm 0.720$  (1.03) pCi/L 04/22/19 11:25 7440-14-4 Calculation



#### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

QC Batch: 337921 Analysis Method: EPA 9315

QC Batch Method: EPA 9315 Analysis Description: 9315 Total Radium
Associated Lab Samples: 2617087001, 2617087002, 2617087003, 2617087004, 2617087005, 2617087006

METHOD BLANK: 1644534 Matrix: Water

Associated Lab Samples: 2617087001, 2617087002, 2617087003, 2617087004, 2617087005, 2617087006

Parameter Act ± Unc (MDC) Carr Trac Units Analyzed Qualifiers

Radium-226 0.156  $\pm$  0.184 (0.361) C:97% T:NA pCi/L 04/18/19 09:01

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



#### **QUALITY CONTROL - RADIOCHEMISTRY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

 QC Batch:
 337913
 Analysis Method:
 EPA 9320

 QC Batch Method:
 EPA 9320
 Analysis Description:
 9320 Radium 228

 Associated Lab Samples:
 2617087001, 2617087002, 2617087003, 2617087004, 2617087005, 2617087006

METHOD BLANK: 1644523 Matrix: Water

Associated Lab Samples: 2617087001, 2617087002, 2617087003, 2617087004, 2617087005, 2617087006

 Parameter
 Act ± Unc (MDC) Carr Trac
 Units
 Analyzed
 Qualifiers

 Radium-228
 0.226 ± 0.293 (0.621) C:88% T:75%
 pCi/L
 04/18/19 15:38

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



#### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **LABORATORIES**

Date: 04/29/2019 03:32 PM

PASI-PA Pace Analytical Services - Greensburg



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2617087

Date: 04/29/2019 03:32 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytica Batch
2617087001	BGWA-2	EPA 9315	337921		!
2617087002	BGWA-29	EPA 9315	337921		
2617087003	BGWC-8	EPA 9315	337921		
2617087004	BGWC-9	EPA 9315	337921		
2617087005	BGWC-12	EPA 9315	337921		
2617087006	Dup-1	EPA 9315	337921		
2617087001	BGWA-2	EPA 9320	337913		
2617087002	BGWA-29	EPA 9320	337913		
2617087003	BGWC-8	EPA 9320	337913		
2617087004	BGWC-9	EPA 9320	337913		
2617087005	BGWC-12	EPA 9320	337913		
2617087006	Dup-1	EPA 9320	337913		
2617087001	BGWA-2	Total Radium Calculation	339292		
2617087002	BGWA-29	Total Radium Calculation	339292		
2617087003	BGWC-8	Total Radium Calculation	339292		
2617087004	BGWC-9	Total Radium Calculation	339292		
2617087005	BGWC-12	Total Radium Calculation	339292		
2617087006	Dup-1	Total Radium Calculation	339292		



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Pace Analy	<i>tical</i> Client Name:	GCA	Powere	Project #	
Courier: Fed E	x 🗆 UPS 🗆 USPS 🗀 Client [	Commercial	Pace Other	WO#:26	
	ooler/Box Present: yes	no Seals	intact: yes	PM: BM CLIENT: GAP	Due Date: 05/03/ uer-CCR
Packing Material:	Bubble Wrap Bubble Bag	None	Other		
Thermometer Use	20 1	e of Ice: Wei		☐ Samples on ice_cor	ling,process has begun
Cooler Temperatu	4	_	is Frozen: Yes No	Date and Initia	s of person examining
Temp should be above			Comments:	contents:	45/19 MZ
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Chain of Custody R		es 🗆 No 🗆 N/A			
Sampler Name & Si		es □No □N/A			
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Rush Turn Around		es DNO DN/A			
Sufficient Volume:		es DNo DN/A			
Correct Containers		es □No □N/A		-	
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Containers Intact:	<u> </u>	es DNo DN/A	10		
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Sample Labels mate		es DNo DN/A			
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	reservation have been checked	és □No □N/A	13		
All containers needing	presentation are found to be in	L	13.	i	
compliance with EPA		es □No □N/A			
exceptions: VOA, colifor	m, TOC, O&G, WI-DRO (water)	es Ano	Initial when completed	Lot # of added preservative	
Samples checked for	r dechlorination:	es □No □N/A	14.		
Headspace in VOA	Vials ( >6mm):	es □No ÆNĀ	15.	<u> </u>	
Trip Blank Present:		es 🗆 No 🗗 N/A	16.		
Trip Blank Custody	Seals Present	es □No ☑N/A			
Pace Trip Blank Lot	# (if purchased):				
Client Notification	Resolution:			Field Data Required	? Y / N
Person Conta	acted:	Date/	Гіте:		
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Project Manager	Review:			Date:	
Note: Whenever there Certification Office ( i.e.	is a discrepancy affecting North Carolin out of hold, incorrect preservative, out	a compliance sam of temp, incorrect	ples, a copy of this for containers)	n will be sent to the North	Carolina DEHNR

Page 16 of 16 F-ALLC003rev.3, 11September2006

# Supplementary Sampling Event May 2019





May 23, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

# Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This revised report replaces the report issued on 5/13/2019. The report has been revised to provide confirmation molybdenum data on BGWC-38D. No other changes have been made to this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Betsy McDaniel

Beton Moamed

betsy.mcdaniel@pacelabs.com

(770)734-4200

Project Manager

**Enclosures** 

cc: Whitney Law, Geosyntec Consultants
Noelia Muskus, Geosyntec Consultants
Rebecca Thornton, Pace Analytical Atlanta







# **CERTIFICATIONS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

**Atlanta Certification IDs** 

110 Technology Parkway Peachtree Corners, GA 30092

Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001

Virginia Certification #: 460204



# **SAMPLE SUMMARY**

Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2618160001	BGWC-22	Water	05/02/19 11:12	05/03/19 13:25
2618160002	BGWA-2	Water	05/02/19 14:15	05/03/19 13:25
2618160003	BGWC-38D	Water	05/02/19 16:10	05/03/19 13:25
2618160004	BGWC-37D	Water	05/03/19 10:38	05/03/19 13:25
2618160005	BGWC-32	Water	05/03/19 10:44	05/03/19 13:25
2618160006	Dup-01	Water	05/02/19 00:00	05/03/19 13:25
2618160007	FBL-050319	Water	05/03/19 11:21	05/03/19 13:25
2618160008	EQBL-050319	Water	05/03/19 11:24	05/03/19 13:25



# **SAMPLE ANALYTE COUNT**

Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2618160001	BGWC-22	EPA 6010D	AAP	1
		EPA 6020B	CSW	14
		SM 2320B	JAD	3
		EPA 300.0	RLC	3
2618160002	BGWA-2	EPA 6010D	AAP	1
		EPA 6020B	CSW	7
		SM 2320B	JAD	3
		EPA 300.0	RLC	3
2618160003	BGWC-38D	EPA 6020B	CSW	1
2618160004	BGWC-37D	EPA 6020B	CSW	1
2618160005	BGWC-32	EPA 6010D	AAP	1
		EPA 6020B	CSW	7
		SM 2320B	JAD	3
		EPA 300.0	RLC	3
2618160006	Dup-01	EPA 6020B	CSW	1
2618160007	FBL-050319	EPA 6010D	AAP	1
		EPA 6020B	CSW	7
		SM 2320B	JAD	3
		EPA 300.0	MWB	3
2618160008	EQBL-050319	EPA 6010D	AAP	1
		EPA 6020B	CSW	7
		SM 2320B	JAD	3
		EPA 300.0	RLC	3



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

Sample: BGWC-22	Lab ID:	2618160001	Collected	d: 05/02/19	11:12	Received: 05/	03/19 13:25 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qua
6010D MET ICP	Analytical	Method: EPA	6010D Prepa	aration Met	hod: El	PA 3010A			
Silicon	5.0	mg/L	0.040	0.0040	1	05/07/19 12:26	05/10/19 02:32	7440-21-3	
6020B MET ICPMS	Analytical	Method: EPA	6020B Prepa	aration Met	hod: El	PA 3005A			
Arsenic	ND	mg/L	0.025	0.0028	5	05/07/19 14:25	05/11/19 12:37	7440-38-2	
Boron	10.1	mg/L	0.040	0.0039	1	05/07/19 14:25	05/09/19 21:21	7440-42-8	M1
Calcium	647	mg/L	25.0	0.69	50	05/07/19 14:25	05/09/19 21:27	7440-70-2	M6
Chromium	ND	mg/L	0.050	0.0078	5	05/07/19 14:25	05/11/19 12:37	7440-47-3	
Cobalt	0.023J	mg/L	0.050	0.0026	5	05/07/19 14:25	05/11/19 12:37	7440-48-4	
Copper	ND	mg/L	0.025	0.0064	5	05/07/19 14:25	05/11/19 12:37	7440-50-8	
Magnesium	84.0	mg/L	2.5	0.31	50	05/07/19 14:25	05/11/19 11:45	7439-95-4	M6
Molybdenum	0.043	mg/L	0.010	0.0019	1	05/07/19 14:25	05/09/19 21:21	7439-98-7	
Nickel	0.010J	mg/L	0.025	0.0048	5	05/07/19 14:25	05/11/19 12:37	7440-02-0	
Potassium	13.6	mg/L	0.10	0.035	1	05/07/19 14:25	05/09/19 21:21	7440-09-7	M1
Selenium	ND	mg/L	0.050	0.0068	5	05/07/19 14:25	05/11/19 12:37	7782-49-2	
Sodium	39.0	mg/L	0.10	0.015	1	05/07/19 14:25	05/09/19 21:21	7440-23-5	M1
Vanadium	ND	mg/L	0.050	0.0097	5	05/07/19 14:25	05/11/19 12:37	7440-62-2	
Zinc	ND	mg/L	0.050	0.010	5	05/07/19 14:25	05/11/19 12:37	7440-66-6	
2320B Alkalinity	Analytical	Method: SM	2320B						
Alkalinity,Bicarbonate (CaCO3)	79.0	mg/L	20.0	20.0	1		05/03/19 17:30		
Alkalinity, Carbonate (CaCO3)	ND	mg/L	20.0	20.0	1		05/03/19 17:30		
Alkalinity, Total as CaCO3	79.0	mg/L	20.0	20.0	1		05/03/19 17:30		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	999	mg/L	12.5	1.2	50		05/10/19 10:37	16887-00-6	
Fluoride	1.4	mg/L	0.30	0.029	1		05/09/19 02:48	16984-48-8	
Sulfate	827	mg/L	50.0	0.85	50		05/10/19 10:37	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

Sample: BGWA-2	Lab ID:	2618160002	Collecte	d: 05/02/19	14:15	Received: 05/	03/19 13:25 Ma	atrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical	Method: EPA 6	6010D Prep	paration Met	hod: El	PA 3010A			
Silicon	4.6	mg/L	0.040	0.0040	1	05/07/19 12:26	05/10/19 03:15	7440-21-3	
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Prep	aration Met	hod: Ef	PA 3005A			
Boron	0.015J	mg/L	0.040	0.0039	1	05/07/19 14:25	05/09/19 22:12	7440-42-8	
Calcium	44.8	mg/L	25.0	0.69	50	05/07/19 14:25	05/09/19 22:18	7440-70-2	
Cobalt	ND	mg/L	0.010	0.00052	1	05/07/19 14:25	05/09/19 22:12	7440-48-4	
Magnesium	25.5	mg/L	2.5	0.31	50	05/07/19 14:25	05/09/19 22:18	7439-95-4	
Molybdenum	ND	mg/L	0.010	0.0019	1	05/07/19 14:25	05/09/19 22:12	7439-98-7	
Potassium	1.9	mg/L	0.10	0.035	1	05/07/19 14:25	05/09/19 22:12	7440-09-7	
Sodium	2.7	mg/L	0.10	0.015	1	05/07/19 14:25	05/09/19 22:12	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 2	320B						
Alkalinity, Bicarbonate (CaCO3)	196	mg/L	20.0	20.0	1		05/03/19 17:34		
Alkalinity, Carbonate (CaCO3)	ND	mg/L	20.0	20.0	1		05/03/19 17:34		
Alkalinity, Total as CaCO3	196	mg/L	20.0	20.0	1		05/03/19 17:34		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	4.3	mg/L	0.25	0.024	1		05/09/19 04:31	16887-00-6	
Fluoride	ND	mg/L	0.30	0.029	1		05/09/19 04:31	16984-48-8	
Sulfate	11.2	mg/L	1.0	0.017	1		05/09/19 04:31	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

Sample: BGWC-38D	Lab ID:	Lab ID: 2618160003		d: 05/02/19	9 16:10	Received: 05/	03/19 13:25 Ma	atrix: Water			
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual		
6020B MET ICPMS Analytical Method: EPA 6020B Preparation Method: EPA 3005A											
Molybdenum Molybdenum	0.11 0.10	mg/L mg/L	0.010 0.010	0.0019 0.00095	1 1		05/09/19 22:24 05/22/19 17:00				



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

Sample: BGWC-37D Lab ID: 2618160004 Collected: 05/03/19 10:38 Received: 05/03/19 13:25 Matrix: Water

Report

Parameters Results Units Limit MDL DF Prepared Analyzed CAS No. Qual

**6020B MET ICPMS** Analytical Method: EPA 6020B Preparation Method: EPA 3005A

Molybdenum 0.040 mg/L 0.010 0.0019 1 05/07/19 14:25 05/09/19 22:30 7439-98-7



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

Sample: BGWC-32	Lab ID:	2618160005	Collecte	d: 05/03/19	10:44	Received: 05/	03/19 13:25 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical	Method: EPA 6	6010D Prep	paration Met	hod: Ef	PA 3010A			
Silicon	4.6	mg/L	0.040	0.0040	1	05/07/19 12:26	05/10/19 03:20	7440-21-3	
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Prep	aration Met	hod: EF	PA 3005A			
Boron	3.4	mg/L	0.040	0.0039	1	05/07/19 14:25	05/09/19 22:35	7440-42-8	
Calcium	203	mg/L	25.0	0.69	50	05/07/19 14:25	05/09/19 22:41	7440-70-2	
Cobalt	0.0078J	mg/L	0.010	0.00052	1	05/07/19 14:25	05/09/19 22:35	7440-48-4	
Magnesium	61.4	mg/L	2.5	0.31	50	05/07/19 14:25	05/09/19 22:41	7439-95-4	
Molybdenum	0.0048J	mg/L	0.010	0.0019	1	05/07/19 14:25	05/09/19 22:35	7439-98-7	
Potassium	4.9	mg/L	0.10	0.035	1	05/07/19 14:25	05/09/19 22:35	7440-09-7	
Sodium	19.2	mg/L	5.0	0.75	50	05/07/19 14:25	05/09/19 22:41	7440-23-5	В
2320B Alkalinity	Analytical	Method: SM 2	320B						
Alkalinity, Bicarbonate (CaCO3)	184	mg/L	20.0	20.0	1		05/03/19 17:39		
Alkalinity, Carbonate (CaCO3)	ND	mg/L	20.0	20.0	1		05/03/19 17:39		
Alkalinity, Total as CaCO3	184	mg/L	20.0	20.0	1		05/03/19 17:39		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Chloride	257	mg/L	5.0	0.48	20		05/10/19 10:59	16887-00-6	
Fluoride	1.3	mg/L	0.30	0.029	1		05/09/19 04:52	16984-48-8	
Sulfate	304	mg/L	20.0	0.34	20		05/10/19 10:59	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

Sample: Dup-01 Lab ID: 2618160006 Collected: 05/02/19 00:00 Received: 05/03/19 13:25 Matrix: Water

Report

Parameters Results Units Limit MDL DF Prepared Analyzed CAS No. Qual

**6020B MET ICPMS** Analytical Method: EPA 6020B Preparation Method: EPA 3005A

Molybdenum **0.11** mg/L 0.010 0.0019 1 05/07/19 14:25 05/09/19 22:47 7439-98-7



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

Sample: FBL-050319	Lab ID:	2618160007	Collecte	d: 05/03/19	11:21	Received: 05/	/03/19 13:25 Ma	atrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical	Method: EPA	6010D Prep	paration Met	hod: El	PA 3010A			
Silicon	ND	mg/L	0.040	0.0040	1	05/07/19 12:26	05/10/19 03:30	7440-21-3	
6020B MET ICPMS	Analytical	Method: EPA	6020B Prep	aration Met	hod: El	PA 3005A			
Boron	0.031J	mg/L	0.040	0.0039	1	05/07/19 14:25	05/09/19 22:52	7440-42-8	
Calcium	0.051J	mg/L	0.50	0.014	1	05/07/19 14:25	05/09/19 22:52	7440-70-2	
Cobalt	ND	mg/L	0.010	0.00052	1	05/07/19 14:25	05/09/19 22:52	7440-48-4	
Magnesium	0.015J	mg/L	0.050	0.0062	1	05/07/19 14:25	05/09/19 22:52	7439-95-4	В
Molybdenum	ND	mg/L	0.010	0.0019	1	05/07/19 14:25	05/09/19 22:52	7439-98-7	
Potassium	ND	mg/L	0.10	0.035	1	05/07/19 14:25	05/09/19 22:52	7440-09-7	
Sodium	ND	mg/L	0.10	0.015	1	05/07/19 14:25	05/09/19 22:52	7440-23-5	
2320B Alkalinity Low Level	Analytical	Method: SM 2	320B						
Alkalinity,Bicarbonate (CaCO3)	ND	mg/L	1.0	1.0	1		05/06/19 17:44		
Alkalinity, Carbonate (CaCO3)	ND	mg/L	1.0	1.0	1		05/06/19 17:44		
Alkalinity, Total as CaCO3	ND	mg/L	1.0	1.0	1		05/06/19 17:44		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	0.062J	mg/L	0.25	0.024	1		05/10/19 18:56	16887-00-6	
Fluoride	ND	mg/L	0.30	0.029	1		05/10/19 18:56	16984-48-8	
Sulfate	0.040J	mg/L	1.0	0.017	1		05/10/19 18:56	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

Sample: EQBL-050319	Lab ID:	2618160008	Collecte	d: 05/03/19	11:24	Received: 05/	03/19 13:25 Ma	atrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP	Analytical	Method: EPA 6	6010D Prep	paration Met	hod: El	PA 3010A			
Silicon	ND	mg/L	0.040	0.0040	1	05/07/19 12:26	05/10/19 03:36	7440-21-3	
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Prep	aration Met	hod: Ef	PA 3005A			
Boron	0.012J	mg/L	0.040	0.0039	1	05/07/19 14:25	05/09/19 22:58	7440-42-8	
Calcium	0.088J	mg/L	0.50	0.014	1	05/07/19 14:25	05/09/19 22:58	7440-70-2	
Cobalt	ND	mg/L	0.010	0.00052	1	05/07/19 14:25	05/09/19 22:58	7440-48-4	
Magnesium	0.0084J	mg/L	0.050	0.0062	1	05/07/19 14:25	05/09/19 22:58	7439-95-4	В
Molybdenum	ND	mg/L	0.010	0.0019	1	05/07/19 14:25	05/09/19 22:58	7439-98-7	
Potassium	ND	mg/L	0.10	0.035	1	05/07/19 14:25	05/09/19 22:58	7440-09-7	
Sodium	0.095J	mg/L	0.10	0.015	1	05/07/19 14:25	05/09/19 22:58	7440-23-5	В
2320B Alkalinity Low Level	Analytical	Method: SM 2	320B						
Alkalinity,Bicarbonate (CaCO3)	ND	mg/L	1.0	1.0	1		05/06/19 17:47		
Alkalinity, Carbonate (CaCO3)	ND	mg/L	1.0	1.0	1		05/06/19 17:47		
Alkalinity, Total as CaCO3	ND	mg/L	1.0	1.0	1		05/06/19 17:47		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	0.29	mg/L	0.25	0.024	1		05/09/19 05:34	16887-00-6	В
Fluoride	ND	mg/L	0.30	0.029	1		05/09/19 05:34	16984-48-8	
Sulfate	0.36J	mg/L	1.0	0.017	1		05/09/19 05:34	14808-79-8	



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

 QC Batch:
 27891
 Analysis Method:
 EPA 6010D

 QC Batch Method:
 EPA 3010A
 Analysis Description:
 6010D MET

 Associated Lab Samples:
 2618160001, 2618160002, 2618160005, 2618160007, 2618160008

METHOD BLANK: 125502 Matrix: Water

Associated Lab Samples: 2618160001, 2618160002, 2618160005, 2618160007, 2618160008

Blank Reporting

 Parameter
 Units
 Result
 Limit
 MDL
 Analyzed
 Qualifiers

 Silicon
 mg/L
 ND
 0.040
 0.0040
 05/10/19 02:21

LABORATORY CONTROL SAMPLE: 125503

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Silicon mg/L 0.97 97 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 125504 125505

MS MSD 2618160001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual 5.0 1 75-125 20 Silicon mg/L 1 5.8 6.1 81 105

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

QC Batch: 27900 Analysis Method: EPA 6020B
QC Batch Method: EPA 3005A Analysis Description: 6020B MET

Associated Lab Samples: 2618160001, 2618160002, 2618160003, 2618160004, 2618160005, 2618160006, 2618160007, 2618160008

METHOD BLANK: 125551 Matrix: Water

Associated Lab Samples: 2618160001, 2618160002, 2618160003, 2618160004, 2618160005, 2618160006, 2618160007, 2618160008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
- arameter				IVIDE		Qualificis
Arsenic	mg/L	ND	0.0050	0.00057	05/09/19 21:09	
Boron	mg/L	ND	0.040	0.0039	05/09/19 21:09	
Calcium	mg/L	ND	0.50	0.014	05/09/19 21:09	
Chromium	mg/L	ND	0.010	0.0016	05/09/19 21:09	
Cobalt	mg/L	ND	0.010	0.00052	05/09/19 21:09	
Copper	mg/L	ND	0.0050	0.0013	05/09/19 21:09	
Magnesium	mg/L	0.012J	0.050	0.0062	05/09/19 21:09	
Molybdenum	mg/L	ND	0.010	0.0019	05/09/19 21:09	
Nickel	mg/L	ND	0.0050	0.00095	05/09/19 21:09	
Potassium	mg/L	ND	0.10	0.035	05/09/19 21:09	
Selenium	mg/L	ND	0.010	0.0014	05/09/19 21:09	
Sodium	mg/L	0.16	0.10	0.015	05/09/19 21:09	
Vanadium	mg/L	ND	0.010	0.0019	05/09/19 21:09	
Zinc	mg/L	ND	0.010	0.0021	05/09/19 21:09	

LABORATORY CONTROL SAMP	LE: 1	125552										
			Spike	LC	CS	LCS	% R	lec				
Parameter		Units	Conc.	Re	sult	% Rec	Lim	its (	Qualifiers			
Arsenic		mg/L		 .1	0.097	97	7	80-120		_		
Boron		mg/L		1	1.0	104	1	80-120				
Calcium		mg/L		1	1.0	103	3	80-120				
Chromium		mg/L	0	.1	0.11	110	)	80-120				
Cobalt		mg/L	0	.1	0.11	106	3	80-120				
Copper		mg/L	0	.1	0.10	102	2	80-120				
Magnesium		mg/L		1	1.1	110	)	80-120				
Molybdenum		mg/L	0	.1	0.11	107	7	80-120				
Nickel		mg/L	0	.1	0.11	108	3	80-120				
Potassium		mg/L		1	1.1	113	3	80-120				
Selenium		mg/L	0	.1	0.097	97	7	80-120				
Sodium		mg/L		1	1.2	119	9	80-120				
Vanadium		mg/L	0	.1	0.11	115	5	80-120				
Zinc		mg/L	0	.1	0.097	97	7	80-120				
MATRIX SPIKE & MATRIX SPIKE	DUPL	ICATE: 1255	53		125554							
			MS	MSD								
		2618160001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qua
Arsenic	mg/L	ND	0.1	0.1	0.11	0.10	106	102	75-125	4	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

MATRIX SPIKE & MATRIX	SPIKE DUPL	ICATE: 1255		1405	125554							
Parameter	Units	2618160001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	mg/L	10.1	1	1	10.7	12.7	59	258	75-125	 17	20	M1
Calcium	mg/L	647	1	1	547	564	-9990	-8280	75-125	3	20	M6
Chromium	mg/L	ND	0.1	0.1	0.11	0.10	106	103	75-125	3	20	
Cobalt	mg/L	0.023J	0.1	0.1	0.13	0.13	106	103	75-125	2	20	
Copper	mg/L	ND	0.1	0.1	0.11	0.10	105	102	75-125	3	20	
Magnesium	mg/L	84.0	1	1	81.0	85.3	-294	135	75-125	5	20	M6
Molybdenum	mg/L	0.043	0.1	0.1	0.14	0.14	101	101	75-125	1	20	
Nickel	mg/L	0.010J	0.1	0.1	0.11	0.11	104	103	75-125	1	20	
Potassium	mg/L	13.6	1	1	14.8	13.2	121	-34	75-125	11	20	M1
Selenium	mg/L	ND	0.1	0.1	0.097	0.11	97	107	75-125	10	20	
Sodium	mg/L	39.0	1	1	39.2	40.1	19	113	75-125	2	20	M1
Vanadium	mg/L	ND	0.1	0.1	0.11	0.10	107	101	75-125	5	20	
Zinc	mg/L	ND	0.1	0.1	0.10	0.097	97	94	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

QC Batch: 28827 Analysis Method: EPA 6020B
QC Batch Method: EPA 3005A Analysis Description: 6020B MET

Associated Lab Samples: 2618160003

METHOD BLANK: 129953 Matrix: Water

Associated Lab Samples: 2618160003

ParameterUnitsBlank ResultReporting LimitMDLAnalyzedQualifiersMolybdenummg/LND0.0100.0009505/22/19 16:49

Morybdenum 111g/L ND 0.010 0.00093 03/22/19 10.4

LABORATORY CONTROL SAMPLE: 129954

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Molybdenum mg/L 0.1 0.10 101 80-120

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 129955 129956

MS MSD MSD MS MSD 2618160003 Spike Spike MS % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Molybdenum 0.21 0.21 104 75-125 0 20 mg/L 0.10 0.1 0.1 104

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

QC Batch: 27709 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity

Associated Lab Samples: 2618160001, 2618160002, 2618160005

METHOD BLANK: 124913 Matrix: Water

Associated Lab Samples: 2618160001, 2618160002, 2618160005

Blank Reporting

Parameter Units Result Limit MDL Analyzed Qualifiers

Alkalinity, Total as CaCO3 mg/L ND 20.0 20.0 05/03/19 16:47

LABORATORY CONTROL SAMPLE: 124914

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers 85-115 Alkalinity, Total as CaCO3 mg/L 100 101 101

SAMPLE DUPLICATE: 124915

Date: 05/23/2019 02:59 PM

2618153004 Dup Max **RPD RPD** Qualifiers Parameter Units Result Result 45.0 0 10 Alkalinity, Total as CaCO3 45.0 mg/L

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

QC Batch: 27817 Analysis Method: SM 2320B

QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity, Low Level

Associated Lab Samples: 2618160007, 2618160008

METHOD BLANK: 125304 Matrix: Water

Associated Lab Samples: 2618160007, 2618160008

Blank Reporting
Parameter Units Result Limit MDL Analyzed Qualifiers

Alkalinity, Total as CaCO3 mg/L ND 1.0 05/06/19 17:35

LABORATORY CONTROL SAMPLE: 125305

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Alkalinity, Total as CaCO3 85-115 mg/L 50 49.5 99

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

QC Batch: 27947 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 2618160001, 2618160002, 2618160005, 2618160007, 2618160008

METHOD BLANK: 125764 Matrix: Water

Associated Lab Samples: 2618160001, 2618160002, 2618160005, 2618160007, 2618160008

		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.10J	0.25	0.024	05/08/19 22:59	
Fluoride	mg/L	ND	0.30	0.029	05/08/19 22:59	
Sulfate	mg/L	0.022J	1.0	0.017	05/08/19 22:59	

LABORATORY CONTROL SAMPLE:	125765					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L		10.2	102	90-110	
Fluoride	mg/L	10	10.3	103	90-110	
Sulfate	mg/L	10	10	100	90-110	

MATRIX SPIKE & MATRIX SF	PIKE DUPL	ICATE: 1257	66		125767							
			MS	MSD								
		2618153001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	61.2	10	10	71.9	71.7	107	105	90-110	0	15	E
Fluoride	mg/L	0.75	10	10	10.2	10.2	94	94	90-110	0	15	
Sulfate	mg/L	ND	10	10	722	722	-13700	-13700	90-110	0	15	E,M1

MATRIX SPIKE SAMPLE:	125768						
Parameter	Units	2618153002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	72.2	10	78.9	68	90-110	E,M1
Fluoride	mg/L	2.9	10	12.1	93	90-110	
Sulfate	mg/L	1300	10	538	-7590	90-110	E,M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



#### **QUALIFIERS**

Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

#### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

#### **ANALYTE QUALIFIERS**

Date: 05/23/2019 02:59 PM

B Analyte was detected in the associated method blank.

E Analyte concentration exceeded the calibration range. The reported result is estimated.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.



# **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Plant Bowen Ash Pond

Pace Project No.: 2618160

Date: 05/23/2019 02:59 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2618160001	BGWC-22	EPA 3010A	27891	EPA 6010D	27950
2618160002	BGWA-2	EPA 3010A	27891	EPA 6010D	27950
2618160005	BGWC-32	EPA 3010A	27891	EPA 6010D	27950
2618160007	FBL-050319	EPA 3010A	27891	EPA 6010D	27950
2618160008	EQBL-050319	EPA 3010A	27891	EPA 6010D	27950
2618160001	BGWC-22	EPA 3005A	27900	EPA 6020B	28014
2618160002	BGWA-2	EPA 3005A	27900	EPA 6020B	28014
2618160003	BGWC-38D	EPA 3005A	27900	EPA 6020B	28014
2618160003	BGWC-38D	EPA 3005A	28827	EPA 6020B	28884
2618160004	BGWC-37D	EPA 3005A	27900	EPA 6020B	28014
2618160005	BGWC-32	EPA 3005A	27900	EPA 6020B	28014
2618160006	Dup-01	EPA 3005A	27900	EPA 6020B	28014
2618160007	FBL-050319	EPA 3005A	27900	EPA 6020B	28014
2618160008	EQBL-050319	EPA 3005A	27900	EPA 6020B	28014
2618160001	BGWC-22	SM 2320B	27709		
2618160002	BGWA-2	SM 2320B	27709		
2618160005	BGWC-32	SM 2320B	27709		
2618160007	FBL-050319	SM 2320B	27817		
2618160008	EQBL-050319	SM 2320B	27817		
2618160001	BGWC-22	EPA 300.0	27947		
2618160002	BGWA-2	EPA 300.0	27947		
2618160005	BGWC-32	EPA 300.0	27947		
2618160007	FBL-050319	EPA 300.0	27947		
2618160008	EQBL-050319	EPA 300.0	27947		



# CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

SAMPLE ID   Section   Se	Company:	Company: Georgia Power - Coal Combustion Residuals	Report To:	Jojn	Report To: Joju Abraham				Attention:	Attention:								Г						1
Authority Country   Particles Country   Part	Address		Copy To:		yntec				Com	sany Na	me:													
SAMPLE ID									Addr	988.											Regula	tory Age	ıcy	
SAMPLE ID   Supplementation   Proceedings   Processing   Processing   Procedings   Processing			Purchase (	Order #:	SCS10	348606			Pace	Quote:														
SAMPLE ID  One Character per los  Sample Is a superior value of the control of th	ne:	Fax	Project Nar		Plant Bowe	in Ash Ponc			Pace	Project	Manage		tsy.mcda.	niel@pa	celabs.c	,moc					State	/ Locatic		
SAMPLE ID	Inested [		Project #:						Pace	Profile a		2									-	GA		
SAMPLE ID	-				(awc	5	CTED				Proce	guitan		N/A	œ	equesto	d Analy	Sis Filt	pared (X)	0	1			
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BGWC-22 BGWA-2 BGWA-2 BGWC-35D WG 5/2/9   1415   1   1   1     1	# M3 II						DATE	T		V-1 V-2 C		HOBN	lonsriteM	sesylenA		Radium 226, 228	Alkalinity				Residual Chloric			
BG.W.C 34D  W.G. 5/21/19 1038  BG.W.C 37D  W.G. 5/21/19 1038  BG.W.C 37D  W.G. 5/21/19 1038  BG.W.C 37D  W.G. 5/21/19 1038  BG.W.C 37D  W.G. 5/21/19 1038  W.G. 5/21/19 1024  W.G. 5/21/19 1	1	BGWC-22		3	6 5/1/				7	-	_				×			¥						
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BGWC-37D w168/21/91038 11 11	3			3	6 5/1/1	1610			-									×						
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EQBL-050319  WTG 5/2/19   124   21   1	2	1		3	5/8/1	41014			7		_			-	×		_	~						
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ADDITIONAL COMMENTS  RELINGUISHED BY MATERIATION  DATE TIME SAMPLE CONDITIONS  CO, MO)  CO, MO)  CO, MO)  SAMPLER NAME AND SIGNATURE  FRINT NAME OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SAMPLER NAME AND SIGNATURE  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON, VAVONICAL FOOR  SIGNATURE OF SAMPLER: A LACK CAFTON VAVONICAL FOOR	80	1		5	5 5/3/1	9 1124			7						×		Ś	×						
ADDITIONAL COMMENTS RELINGUISHED BY AFFILIATION DATE TIME SAMPLE CONDITIONS  (Ca, Ma, K, Na, B, S; Author, Crafton 5/3/19, 1325 (Manufactur) 5/3/19,	6																$\perp$							
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ADDITIONAL COMMENTS  RELINQUISHED BY A FFILLATION  CO, MO, K, Na, B, S;  ALOVEY CRAFTON 5/3/19 1325  CO, MO)  WO#: 2618160  SAMPLER NAME AND SIGNATURE  FRINT NAME OF SAMPLER: A LOVEY CRAFTON, CLOPED BY AFFILLATION  BANDLER NAME OF SAMPLER: A LOVEY CRAFTON, CLOPED BY AFFILLATION  ACCEPTED BY AFFILLATION  DATE TIME  SAMPLE CONDITIONS  SAMPLER NAME AND SIGNATURE  FINAL SAMPLER: A LOVEY CRAFTON, VEVOIN CLOPED BY AFFILLATION  SAMPLER NAME AND SIGNATURE  FINAL SAMPLER: A LOVEY CRAFTON, VEVOIN CLOPED BY AFFILLATION  SAMPLER NAME AND SIGNATURE OF SAMPLER: A LOVEY CRAFTON, VEVOIN CLOPED BY AFFILLATION  SAMPLER NAME OF SAMPLER: A LOVEY CRAFTON, VEVOIN CLOPED BY AFFILLATION  SAMPLER NAME OF SAMPLER: A LOVEY CRAFTON, VEVOIN CLOPED BY AFFILLATION  SAMPLER NAME OF SAMPLER: A LOVEY CRAFTON, VEVOIN CLOPED BY AFFILLATION  SAMPLER NAME OF SAMPLER: A LOVEY CRAFTON, CLOPED BY AFFILLATION  SAMPLER NAME AND SIGNATURE OF SAMPLER: A LOVEY CRAFTON, CLOPED BY AFFILLATION  SAMPLER NAME OF SAMPLER: A LOVEY CRAFTON CRAF	12																							
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WO#: 2618160  SAMPLER NAME AND SIGNATURE  PRINT Name of SAMPLER: Audvey Crafton Venonice Fork SIGNATURE of SAMPLER: Audvey Crafton Venonice Fork  SIGNATURE of SAMPLER: Audvey Crafton Venonice Fork  SIGNATURE of SAMPLER: Audvey Crafton Venonice Fork  Em P. S. S. S. S. S. S. S. S. S. S. S. S. S.	etals	(Co, Mg, K, Na, B, Co, Mo)	A	when		of tan		5/3/19		57		4	2	the state of the s	ta	7	9	13/4	187	6	5:5	X	2	
PRINT Name of SAMPLER: Hudrey Crafton Veronice Forks SIGNATURE of SAMPLER: M. M. L. C. C. C. C. C. C. C. C. C. C. C. C. C.	Pag	WO#: 2618160					R NAME A	ND SIGNA	TURE													l		
	je 22 of					PRIN	AT Name o	of SAMPLE			1	afto	1	lero	ni Cc	Sig	404				э ч амэ	6	natody	(N/)

Sai	mple Condition	n Upon Receip	MO#	2618160
Pace Analytical Client Name	: EA Pou	ver CCR	PM: BM CLIENT:	Due Data OF Man
Courier: Fed Ex UPS USPS Clie	nt Commercial	☐ Pace Other		Proj. Due Date: Proj. Name:
Custody Seal on Cooler/Box Present:	no Seals	s intact:  yes	☐ no	
Packing Material: Bubble Wrap	Bags None	Other		
Thermometer Used (182	Type of Ice: We	f Blue None		s on ice, cooling process has begun
Cooler Temperature 5.5°C  Temp should be above freezing to 6°C	Biological Tissue	e is Frozen: Yes No Comments:		e and Initials of person examining ontents: 5/3/19(44)
Chain of Custody Present:	□Yes □No □N/A	1.		
Chain of Custody Filled Out:	☐Yes ☐No ☐N/A	2.		
Chain of Custody Relinquished:	□Yes □No □N/A	3.		
Sampler Name & Signature on COC:	□Yes □No □N/A	4.		
Samples Arrived within Hold Time:	□Yes □No □N/A	5.		
Short Hold Time Analysis (<72hr):	□Yes □N/A	6.		
Rush Turn Around Time Requested:	□Yes ☑No □N/A	7.		
Sufficient Volume:	☐Yes ☐No ☐N/A	8.		
Correct Containers Used:	₽Yes □No □N/A	9.		
-Pace Containers Used:	Pres ONO ON/A			
Containers Intact:	ØYes □No □N/A	10.		
Filtered volume received for Dissolved tests	□Yes □No □N/A	111.		
Sample Labels match COC:	TYES ONO ON/A	12.		
-Includes date/time/ID/Analysis Matrix:	DYES ONO ON/A	13.		
All containers needing preservation are found to be in compliance with EPA recommendation.	Yes No NA			
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	□Yes ○Ho	Initial when completed	Lot # of preserv	
Samples checked for dechlorination:	□Yes □No □N/A	14.		
Headspace in VOA Vials ( >6mm):	□Yes □No ☑N/A	15.		
Trip Blank Present:	□Yes □No □N/A	16.		
Trip Blank Custody Seals Present	□Yes □No ØN/A			
Pace Trip Blank Lot # (if purchased):				
Client Notification/ Resolution:			Field D	ata Required? Y / N
Person Contacted:	Date	/Time:	r ieid Da	ata Negulieu ! / N
Comments/ Resolution:	5000			
Project Manager Review:				Date:

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)