Prepared for

Georgia Power Company
241 Ralph McGill Boulevard NE
Atlanta, GA 30308-3374

SITE ACCEPTABILITY REPORT FOR PROPOSED CCR LANDFILL EXPANSION

PLANT WANSLEY

GEORGIA POWER COMPANY

CARROLL and HEARD COUNTIES, GEORGIA

Prepared by

Geosyntec consultants
engineers | scientists | innovators

1255 Roberts Boulevard, Suite 200
Kennesaw, Georgia 30144

GEORGIA REGISTERED No. PE043417 PROFESSIONAL ENGINEER JEREMY GASSER

Digitally signed by Jeremy Gasser
Date: 2024.01.27 16:12:42 -06'00'

JOSEPH M. IVANOWSKI No. 002140 GEORGIA REGISTERED PROFESSIONAL GEOLOGIST

Joe Ivanowski
2024.01.29 09:12:06 -05'00'

Project Number GW8701

January 2024

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS

AP-1	Ash Pond 1
ASTM	American Society for Testing and Materials
CCR	Coal Combustion Residuals
CEC	Cation Exchange Capacity
CFS	Civil Field Services
cm/s	Centimeter/Second
D	Distance
E	East
ft	Feet
g	Earth's Gravitational Pull
G	Gradient
GAEPD	Georgia Environmental Protection Division
HDPE	High-Density Polyethylene
HSA	Hollow-Stem Auger
HQ	Wireline Rock Coring
K_h	Horizontal Hydraulic Conductivity
K_v	Vertical Hydraulic Conductivity
mEq/100g	milliequivalents/100 grams
N	North
NAVD88	North American Vertical Datum of 1988
NHP	National Historical Park
NPDES	National Pollutant Discharge Elimination System
P	Permeability
PVC	Polyvinyl Chloride
PWR	Partially Weathered Rock
RQD	Rock Quality Designation
S	South or Sorption Capacity
SAR	Site Acceptability Report
SCS	Southern Company Services
SDWIS	Safe Drinking Water Information System
SE	Southeast
SPT	Standard Penetration Test
T	Thickness
USACE	United States Army Corps of Engineers

USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
W	West
WT	Water Table

EXECUTIVE SUMMARY

Georgia Power Company's (Georgia Power) Plant Wansley (Plant) lies in two counties, Heard and Carroll, located in west Georgia. The Plant historically contained two coal fired units and four gas-fired combined cycle units; however, the two coal units (Units 1 and 2) were officially retired on 31 August 2022 and the Plant no longer generates electricity by burning of coal. Constructed in the early 1970's the Plant operated one coal combustion residual (CCR) pond identified as Ash Pond 1 (AP-1). AP-1 is currently inactive and will be closed by removal, specifically, by relocation of the CCR stored in the pond to an existing onsite landfill (CCR Landfill) which will require expansion of the current permitted waste limits. Georgia Power intends to request a major modification to the permit for the existing CCR Landfill facility.

According to Circular 14, *Criteria for Performing Site Acceptability Studies for Solid Waste Landfills in Georgia* [McLemore and Perriello, 1997], a site evaluation has been performed to assess the suitability of the proposed area for expansion of the existing CCR Landfill which is presented in this "Site Acceptability Report for Proposed CCR Landfill Expansion". In accordance with Circular 14, the evaluation was performed for a "moderate potential" industrial landfill site, with wastes including bottom ash, fly ash, gypsum, dewatered CCR solids, wastewater treatment plant solids, and minor amounts of ash-impacted soils.

The following key points are discussed in the report:

- The Site is not located within:

  - 0.5 mile of a County boundary;
  - 5,708 yards of a National Historic Site;
  - the 100-year floodplain;
  - a Most Significant Groundwater Recharge Area; and
  - 200 feet of a fault that has had displacement in Holocene time.

- A minimum 200-foot buffer will be maintained between the waste disposal boundary or limit of waste, and the CCR permit boundary.

- A site-specific survey was completed to identify streams, wetlands, and open waters within the area that may be affected by construction of the proposed landfill expansion. Any jurisdictional feature impacts will be permitted as required by the USACE 404 permitting process. Where unavoidable impacts will occur to stream buffers, a buffer variance will be obtained from Georgia Environmental Protection Division (GAEPD) for non-exempt buffer encroachments. No Section 10 Waters of the U.S. or trout streams were identified within the survey area.

- Twenty-three (23) potential private water wells were identified within ½ mile of the Site. These wells are all hydraulically upgradient of the Site. No public supply wells or surface water intakes were identified within two miles of the Site.

- A composite liner system made up of a 2-foot-thick clay layer with a permeability of 1 x 10^{-7} centimeters per second (cm/s) or less overlain by a 60-mil high-density polyethylene (HDPE) liner, or an alternative composite liner system of equivalent performance, will be employed.

- The existing groundwater monitoring network will be modified to provide additional monitoring wells designed to provide early detection of releases from the landfill expansion area in the unlikely event that regulated constituents are released from the facility.

- Groundwater pollution potential was evaluated using the LeGrand Method as described in Circular 14, using measured Site input parameters. The LeGrand analysis produced a score of 19.2 for a lined site, indicating a minimal risk to groundwater quality.

The Site is found to be suitable to accommodate the proposed expansion of the existing CCR Landfill.

1. INTRODUCTION AND GENERAL SITE AREA

1.1 Introduction and Description of the General Site Area

Georgia Power Company's (Georgia Power) Plant Wansley (Plant) lies in two counties, Heard and Carroll located in west Georgia. The Plant historically contained two coal fired units and four gas-fired combined cycle units; however, the two coal units (Units 1 and 2) were officially retired on 31 August 2022 and the Plant no longer generates electricity by burning of coal. Constructed in the early 1970's the Plant operated one CCR pond identified as AP-1. **Figure 1-1** shows the plan view of the Plant. AP-1 is currently inactive and will be closed by removal, specifically, by relocation of the CCR stored in the pond to an existing onsite landfill (CCR Landfill) which will require expansion of the current permitted waste limits. The current existing CCR Landfill and the proposed expansion areas are collectively referred to herein as the "Site" within this text and its limits shown as the "CCR Permit Boundary" within the figures.

In November 2016, GAEPD adopted amendments to the State's Rules for Solid Waste Management [GAEPD 391-3-4-10], hereinafter referred to as the State CCR Rule. The amendments to the State Solid Waste Rules require all CCR units in Georgia to obtain a Solid Waste Handling Permit, including new disposal units at electric utilities. The amendments incorporate by reference the Federal CCR Rule initiated by the United States Environmental Protection Agency (USEPA). The proposed expansion of the CCR Landfill at Plant Wansley is to be sited, designed, permitted, constructed, operated, and closed in accordance with the State CCR Rule (GAEPD 391-3-4-.10), and therefore by reference, is subject to applicable provisions of the Federal CCR Rule (USEPA 40 CFR §257).

This site acceptability report (SAR) was prepared in accordance with relevant sections of the GAEPD guidance document "*Criteria for Performing Site Acceptability Studies for Solid Waste Landfills in Georgia, Circular 14*" (McLemore and Perriello, 1997) referenced in the State CCR Rule to assess the suitability of the Site for the proposed expansion of the CCR Landfill facility. Georgia Power intends to request a major modification to the permit for the existing CCR Landfill facility [Permit No. 074-005D(CCR)]. As with the existing CCR Landfill, the expansion will be designed to receive gypsum and other CCR materials [as defined in Permit No. 074-005D(CCR)]. This SAR describes the current Site conditions at the existing CCR Landfill site as they relate to the requirements for moderate potential industrial landfills outlined in Circular

14, Appendix A, Section (2) (A) through (J), and the design requirements specified in the Solid Waste Rules, Chapter 391-3-4.

The information in this SAR was developed by Geosyntec and takes into consideration information presented in the previous SAR prepared by the Earth Science and Environmental Engineering Southern Company Generation team in October 2007 [SCS 2007]. This SAR expands on the previous study to include all historical investigations as well as subsequent investigations conducted since the construction of the existing CCR Landfill, such as installation of the monitoring well network and investigations to assess the Site for the proposed expansion. The original 2007 SAR is included as **Appendix A** in this document.

1.1.1 Location

Plant Wansley is located in northeast Heard County and southeast Carroll County, Georgia, off Liberty Church Road, approximately 15 miles west of the city of Newnan, 9 miles northeast of the city of Franklin and 12 miles southeast of the city of Carrollton. The physical address of the plant is 1371 Liberty Church Road, Carrollton, Georgia. The Plant property encompasses approximately 5,200 acres and is bounded on the east by the Chattahoochee River.

The existing CCR Landfill permit boundary is comprised of approximately 325 acres located along the north side of Hollingsworth Ferry Road, south-southeast of the Plant. The proposed expansion of the CCR Landfill will not increase the acreage of the existing landfill permit boundary but will involve expanding the waste footprint within that boundary. The Site is located at approximate longitude W85° 03’ and latitude N33° 24’. Georgia Power proposes to develop a lateral expansion of this landfill by constructing an additional expansion area in the north-central portion of the existing unit and raising the overall stack height to accommodate the additional CCR material from AP-1. The regional topographic map and the Plant and Site boundaries are shown on **Figure 1-1**.

1.1.2 General Topography

The Plant is located within the Piedmont Physiographic Province (Piedmont) of western Georgia, which is characterized by gently rolling hills and narrow valleys, with locally pronounced linear ridges. As is characteristic of this province, the Site lies adjacent to a minor ridge along the west and south sides. Other than minor ridges and hills, the Site slopes gently east and southeast toward the Chattahoochee River. The Site vicinity has a topographic relief of approximately 170 feet, with a high elevation of 850 feet relative to

North American Vertical Datum of 1988 (NAVD88) on the northwest ridge and a low elevation of 680 feet NAVD88 along the southeastern corner. These topographic features and the Site location are depicted on the United States Geological Survey (USGS) Lowell, Georgia 7.5-minute topographic quadrangle map provided on **Figure 1-1**. A topographic survey of existing site conditions was prepared by a Georgia-registered land surveyor and is included in **Appendix B**.

1.1.3 General Geology

The Site is located within the Southern Piedmont Physiographic province, which lies between the Blue Ridge Mountains and the Upper Coastal Plain. The Piedmont is generally underlain by a variably thick blanket of overburden, which is comprised of residual and saprolitic soils derived from the in-place weathering of bedrock. Occasional deposits of alluvium are present in valleys and drainage features. A mantle of partially weathered rock (PWR) and the upper fractured surface of the bedrock in the Piedmont comprises a zone often referred to as the “transition zone.” The overburden soils and PWR are commonly referred to collectively as the regolith.

1.1.4 General Hydrology

The Site is located within the Chattahoochee River Basin. Surface waters at the Site primarily drain to the east-southeast toward the river. The Chattahoochee River is a major river in the state of Georgia flowing from the northeast part of the state to the southwest across the state then flowing south along the Georgia-Alabama border. The river is located approximately 2,000 feet to the east of the Site.

1.1.5 Land Use

The Site is bordered to the north by portions of the Wansley power generation facility including a power line right of way, to the west and south by Hollingsworth Ferry Road and a mixture of single-family site dwellings and manufactured homes, and to the east by wooded land and portions of the power generation facility.

1.1.6 Population

The population of Heard County, Georgia in 2020 was estimated at 11,973. From 2010 to 2020, the county grew in population by an estimated 1.23%. Carroll County, located to the north of the Site had an estimated population of 121,633 in 2020, an increase of 10.01% since 2010. The *Carroll County Comprehensive Plan Update 2018* stated that a majority of the growth in the county was along the Interstate 20 (I-20) corridor and is due to ease of access to major cities such as Atlanta (Comprehensive Plan Update 2018). Coweta County, to the east of the Site had an estimated population of 150,849 in 2020 with an increase of 18.44% since 2010 (U.S. Census Bureau, 2022).

1.1.7 Threatened and Endangered Species

The flora of the Site is typical of temperate deciduous forests, however, much of the Site lies within an area that has been previously developed as part of the existing CCR Landfill. A survey to identify threatened and endangered species as well as protected wildlife habitat was conducted by Ecological Solutions, Inc. in March 2022. The survey indicated potential habitat for one federally listed (monarch butterfly) and four state protected (bald eagle, bay star-vine, blue stripe shiner, and highscale shiner) species within the permit boundary for the CCR Landfill. These species were not directly observed at the Site, but potential habitats, foraging, or roosting areas are present. The proposed expansion of the CCR Landfill is not expected to significantly impact these species. The survey report is included in **Appendix C**.

1.2 Zoning

Georgia Power Company received a letter from the Heard County Commission on 19 September 2022 stating that the proposed expansion of the solid waste disposal facility at Plant Wansley complies with local zoning and land use ordinances. A copy of this letter is included in **Appendix D**.

1.3 Proximity to Floodplains

Circular 14 states that a solid waste handling facility located in the 100-year floodplain must not restrict the flow of the 100-year flood. No portion of the proposed landfill expansion is within the 100-year floodplain based on flood hazard information from the Georgia Flood Map Program (Flood Map Number 13149C0070D). The extent of the 100-year floodplain is shown on **Figure 1-1** (Federal Emergency Management Agency, 2017).

1.4 Proximity to Streams and Wetlands

A survey to evaluate the presence of jurisdictional wetlands or waters regulated by the U.S. Army Corps of Engineers (USACE) and/or State waters potentially requiring a buffer in the vicinity of the Site was conducted by Ecological Solutions, Inc. in March 2022. The survey identified 46 jurisdictional features including 26 streams, 18 wetlands, and two open waters. The jurisdictional features included seven ephemeral streams, 14 intermittent streams, five perennial streams, and 21 State waters requiring a buffer. There were nine non-jurisdictional features identified.

Construction of the landfill expansion will require the relocation of a jurisdictional feature (perennial stream) that is currently located within the footprint of the proposed new landfill cell (Cell 4). The routing and associated infrastructure for this stream relocation is described in the permit application *Section 404 Individual Permit and Section 401 Water Quality Certification Application – Plant Wansley Coal Combustion Residual Landfill (SAS-2009-00552)* submitted to the USACE on 21 April 2023. Any additional jurisdictional feature impacts will be permitted as required by the USACE 404 permitting process. Where unavoidable impacts will occur to stream buffers, a buffer variance will be obtained from GA EPD for non-exempt buffer encroachments. No Section 10 Waters of the U.S. or trout streams were identified within the survey area.

A map depicting the wetlands and streams identified in the Site vicinity during this survey is included as **Figure 1-2**. The wetlands survey report is included in **Appendix C**.

1.5 Proximity to National Historic Sites

Appendix A of Circular 14 states that no industrial solid waste landfill shall be located within 5,708 yards (~3¼ miles) of a National Historic Site. A search of the National Historic Sites found four (4) sites in the state of Georgia, Martin Luther King Jr. National Historical Park (NHP), Ocmulgee Indian Mounds NHP, Andersonville National Historic Site, and Jimmy Carter NHP. All sites are located outside the radius stated in Circular 14.

1.6 Proximity to Roads, Airports, and Railroads

The Site is adjacent to Hollingsworth Ferry Road which is located approximately 415 feet to the south of the CCR Landfill permit boundary. The closest railroad to the Site is a rail spur used by Georgia Power located along Georgia Power Road (internal site road). The CCR Landfill is located approximately 1,600 feet (0.3 miles) from the rail spur. The CCR material being placed in the proposed landfill expansion is non-putrescible and unlikely to attract birds that pose a danger to aircraft.

1.7 Proximity to County Boundaries

The Plant property is located in both Carroll and Heard Counties, and borders Coweta County along the Chattahoochee River. The Site lies entirely within Heard County approximately 1.6 miles south of Carroll County, and 2.3 miles west of Coweta County.

1.8 Wellhead Protection

There are no wells or springs located within two miles of the CCR permit boundary to which wellhead protection requirements apply. The Rules for Safe Drinking Water (Chapter 291-3-5-.40) specify a wellhead protection area around wells and springs that are used as a source of water supply for community public water systems serving a municipality, county, or authority.

1.9 Proximity to Most Significant Groundwater Recharge Areas

Circular 14 states that a Significant Ground-Water Recharge Area is any area designated on Hydrologic Atlas 18, Most Significant Ground-Water Recharge Areas of Georgia, 1989. A review of the atlas shows the Site does not fall within an area of significant groundwater recharge. The nearest probable area of thick soils (which may be a significant recharge area) is located about 2.5 miles southwest of the Site. **Figure 1-3** shows the nearest probable areas of thick soils.

1.10 Proximity to Public and Domestic Water Supplies

Appendix A, Section (2)(G)(1) of Circular 14 requires that all public water supply wells or surface water intakes within two miles, and private (domestic) water supply wells within ½-mile of the proposed industrial landfill site must be identified. A water well survey was conducted by NewFields Companies, LLC in March 2019. Additional database reviews were conducted by Geosyntec in December 2022. Records were reviewed for an area with a radius of two miles from the permit boundary of the proposed landfill expansion. NewFields reviewed national databases including the USGS, and Safe Drinking Water Information System (SDWIS), a USEPA supported database. At the state level, information was requested from GAEPD, and the Agricultural and Environmental Services Laboratory at the University of Georgia. Geosyntec collected local information from county health departments, water departments, and tax assessor databases for Heard, Carroll, and Coweta counties. Additionally, a windshield survey was conducted to ground truth the findings of the database searches.

Public water is available throughout most of the investigated area, supplied by the Carroll County Water Authority and the Heard County Water Authority. The Coweta Water Authority does not supply water in the study area. No public water supply wells or surface water intakes were identified within a two-mile radius of the Site. Twenty-three (23) potential private water wells were identified within ½-mile of the Site, as shown in **Figure 1-4**. Well construction information was not available for these locations, and it is not known if any of the wells are actively used. Due to the age of the county records reviewed, these wells may no longer be in service or may have been abandoned, as public water is supplied by Heard County to the properties within this area. Twenty (20) of the wells are located due south of the landfill and three are located to the northwest. All of the well locations are separated from the Site by topographic ridges that likely represent groundwater divides. Therefore, it is reasonable to expect all of the wells to be hydrologically separated from the Site, and none are considered to be hydraulically downgradient.

2. SURFACE AND SUBSURFACE INVESTIGATIONS

Circular 14 requires that the siting assessment for industrial waste disposal facilities include a description of general site conditions including topographic setting, borings and wells installed at the Site (including specifics on drilling and installation methods), hydrogeologic conditions and groundwater flow regime, and potential natural or geologic hazards in the vicinity of the Site. The following sections address these characteristics of the area within and surrounding the Site, based primarily on information gathered during site investigations performed by Geosyntec and Southern Company Services (SCS).

2.1 Topographic Description

The general topography of the Site slopes from the west to the east-southeast toward the Chattahoochee River. There are some intermittent streams around the Site that form a dendritic pattern and flow to the northeast, east, and southeast where they eventually discharge into the river. The Site is partially vegetated with mature mixed pine and hardwoods, however the majority of the Site is comprised of the developed Existing CCR Landfill. A 7.5-minute topographic quadrangle showing Site topography is shown in **Figure 1-1**.

2.2 Boring and Sampling Program

Three site investigation programs have been conducted at the Site. In 2006 a site investigation was conducted by SCS to evaluate the suitability of the Site for construction of a CCR (gypsum) landfill. The completion of that study led to the initial permitting of the landfill, and the installation of a groundwater monitoring network (GWA- and GWC-series wells), which was completed in 2011 around the perimeter of the Site. Finally, a site investigation in 2021 and 2022 was conducted by Geosyntec to investigate the suitability of the Site for an expansion of the existing permitted CCR Landfill. These investigations are discussed in greater detail in the section below.

2.2.1 Borehole Drilling and Well and Piezometer Installation

During the initial 2006 siting study conducted by SCS, 31 borings were advanced using hollow-stem auger (HSA) and wireline rock coring (HQ) methods across the entire proposed landfill area, as shown in **Figure 2-1**. Borings were advanced through the regolith using the HSA to the top of the bedrock surface and split spoon samples logged for lithology by a geologist. At locations advanced into bedrock, wireline rock coring was used to reach target depths. Temporary piezometers were installed in these boreholes.

The piezometers were constructed of 2-inch diameter schedule 40 polyvinyl chloride (PVC) riser and 10-feet of slotted (0.010-inch) PVC screen. A two-feet thick seal of ¼-inch bentonite pellets was placed above a filter pack of clean quartz sand and the remaining annular space was filled with bentonite chips. The temporary piezometers associated with the 2006 site investigation were abandoned following collection of seasonal water level and aquifer data in accordance with the Water Well Standards Act. A copy of the SCS Civil Field Service (CFS) drillers performance bond is included in **Appendix E**. Construction details of these borings and piezometers are included on **Table 2-1**, and logs of the borings included in **Appendix F**.

In 2011 SCS installed a series of monitoring wells around the landfill. Borings were advanced using a combination of rotasonic and HSA drilling methods by Boart Longyear of Aiken, South Carolina, and SCS CFS, respectively. For the sonic boreholes, continuous cores of soil and rock were collected using a 4-inch diameter sonic core barrel and 6-inch diameter outer drill casing and logged by a geologist. Monitoring wells were installed at each location and were constructed of 2-inch diameter schedule 40 PVC riser with a 10-foot slotted (0.010-inch) PVC screen. A minimum two-foot bentonite seal was placed above a sand filter pack that extended two-feet above the top of screen. The remaining annular space was filled with a cement and bentonite grout mixture to the surface using the tremie method. Surface completions were installed by placing an aluminum protective housing around the well with a lockable lid. A 3-foot by 3-foot concrete well pad was poured and a bollard was placed at each corner of the well pad. Boring logs are included in **Appendix F**.

In late 2021 to early 2022 Geosyntec conducted a site investigation, installing 22 borings and five temporary piezometers. The drilling was conducted by Thompson Engineering (Thompson) out of Mobile, Alabama. A copy of Thompson's drillers performance bond is included in **Appendix E**. The Geosyntec borings were completed using mud-rotary and wireline rock coring and located primarily in the area between Cells 2 and 3 and on the south and east side of the existing CCR Landfill, as shown in **Figure 2-2**. Standard Penetration Tests (SPTs) were conducted to collect soil for lithologic logging and for laboratory analysis at intervals of two to five feet on center. The SPTs were conducted in accordance with American Society for Testing and Materials (ASTM) ASTM D1586. Shelby tubes were also used to obtain undisturbed soil samples for laboratory testing in accordance with ASTM D1587. Split-spoon samples were examined and classified in accordance with ASTM D2488 and documented on boring logs in the field by a Geosyntec geologist. Three of the borings terminated before hitting bedrock, 16 borings terminated at the top of bedrock, and three borings were advanced into rock using wireline rock coring methods. Seventeen (17) geotechnical borings (GS-106 through GS-122) were advanced with a mud-rotary drill rig but did not have a piezometer set. These borings were abandoned with a bentonite grout mixture that was placed via tremie pipe.

Five (5) temporary piezometers were installed by Geosyntec at locations GS-101, GS-102, GS-103, GS-104, and GS-105 to monitor seasonal groundwater levels and to estimate the horizontal hydraulic conductivity (K_h) of the subsurface geologic units. Piezometers GS-101, GS-103, and 104 were all screened in regolith material, while GS-102 and GS-105 were screened across the regolith-bedrock transition zone, as summarized in **Table 2-1**. The installation of these piezometers included a 2-inch diameter Schedule 40 PVC riser and screen with a screen slot size of 0.010 inch. A 20/40-mesh sand filter pack placed two to six feet above the top of the screen. Bentonite chips were used for the seal which ranged in thickness from three to seven feet. The remaining open anulus was grouted to surface via tremie pipe with a high-solids bentonite grout mixture. Boring and construction logs are included in **Appendix F**.

Piezometers installed at the Site were developed using surging and purging methods to remove fines from the filter pack and well screen and to improve hydraulic communication between the well screen and the aquifer.

2.2.2 Laboratory Testing

The investigation by SCS in 2006 included a soil sampling and laboratory testing program for estimating geotechnical properties of Site soils. Samples were taken using split-spoon sampling methods on 5-foot center spacing until auger refusal was encountered. A total of 12 undisturbed samples were collected at six locations in the upper 14 feet of the regolith. The undisturbed samples were collected using Shelby tubes in accordance with ASTM D1587 and were pushed into undisturbed material in a smooth, continuous motion. Recovered samples were prepared in a way to minimize disturbance of the sample while in transport for laboratory testing. The laboratory testing of soil samples was performed by Southern Company Generation in Alabaster, Alabama. The tests selected for the 2006 investigation included:

- Grain Size (Mechanical Sieve) (*ASTM D-422*);
- Atterberg Limits (*ASTM D-4318*);
- Engineering Classification (*ASTM D-2487*);

- Bulk Specific Gravity (*ASTM D-854*);
- Moisture Content (*ASTM D-2216*);
- Compaction Characteristics of Soil Using Standard Effort (*ASTM D-698*);
- Batch-Type Measurement of Contaminant Sorption by Soils and Sediments (*ASTM D-4646*);
- Falling Head Permeability Tests (*USACE Method*); and
- Cation Exchange Capacity (*USEPA Method SW-846*).

Location information related to the geotechnical borings is summarized in **Table 2-2**, and the results of the laboratory tests conducted on the selected samples is included in **Table 2-3**.

Soil samples were also collected from the soil borings installed by Geosyntec at 22 locations during the 2021-2022 site investigation. These samples were selected for laboratory testing based on the geology of the Site, visual description of the samples, spatial distribution, and SPT results. The laboratory testing program was developed to provide additional geotechnical site characterization for the area underlying the existing CCR Landfill. The laboratory testing was performed by Excel Geotechnical Laboratory, Inc. (Roswell, Georgia), following testing procedures in general accordance with applicable ASTM standards.

A total of 30 soil samples were selected from 17 locations (GS-101, GS-103, GS-104, GS-105, GS-106, GS-108, GS-111, and GS-112, GS-114, GS-115, GS-116, GS-117, GS-118, GS-119, GS-120, GS-121, GS-122), including eight (8) undisturbed Shelby tube samples, with the remaining being collected using SPT split-spoon sampling methods. The following tests were performed on the selected soil samples and used in support of this SAR:

- Bulk Specific Gravity (*ASTM D854*);
- Grain Size (Mechanical Sieve) (*ASTM D422*);
- Atterberg Limits (*ASTM D4318*);

- Moisture Content (*ASTM D2216*);
- Engineering Classification (*ASTM D2487*);
- Consolidated-undrained (CU) triaxial compression test (*ASTM D4767*);
- Flexible Wall Permeability (*ASTM D5084*); and
- One-Dimensional Consolidation (*ASTM D2435*).

The results of the tests listed above are summarized in **Table 2-3**. The laboratory test data collected for this set of samples is included in **Appendix G**.

2.3 Description of Soils and Rocks

2.3.1 Overview

The Site is located within the Piedmont physiographic province, in which the bedrock generally consists of metamorphic crystalline rocks, such as schists, gneisses, and quartzite. Piedmont soils are mainly residual in nature, resulting from the in-place weathering of the underlying bedrock and may range from sand to silt and clay, often retaining some of the structure of the parent rock. The subsequent sections provide further details on the geology of the Site.

2.3.2 Site Geology

Subsurface investigations identified three primary lithologic units in the area of the Site. From top to bottom, these units are (i) residual soils and saprolite, (ii) PWR, and (iii) bedrock. Occasional deposits of alluvial material are present along streams and drainage features, but these units are generally not laterally extensive. The three primary units extend across the Site and are shown in geologic cross-sections A-A', B-B', C-C', and D-D'. The section alignments are shown in **Figure 2-3**, and the section profiles in **Figure 2-4**. Boring logs for borings, wells, and piezometers shown on the cross-sections are included in **Appendix F**.

The lithologic units are described in more detail below, noting their composition and thickness. Unit descriptions and thickness ranges were compiled from boring logs and information gathered during the three historical site investigations completed at the Site.

2.3.2.1 Residual Soils and Saprolite

Residual and saprolite soils resulting from the in-situ weathering of the parent bedrock make up a large portion of the subsurface and has been encountered across the Site. Saprolite tends to display relict structures and properties of the parent bedrock such as foliation, mineral banding, and intrusive pegmatites, but has the consistency of a soil (unconsolidated). This unit ranges in thickness at the Site from a few feet to over 85 feet. The material is described as sandy silt, silty sand, sandy clay, and silty clay.

2.3.2.2 Partially Weathered Rock

As the saprolite transitions to a more rock-like material approaching the bedrock surface, a zone referred to as PWR is encountered. The PWR unit is the hard, semi-consolidated, weathered to intensely fractured rock interface. This unit ranges in thickness from 0.5 to 50 feet and was generally encountered in most borings across the Site. The unit may include hard, but friable, decomposed rock, as well as gravel to cobble-size rock fragments bound by clay and silt saprolite matrix. The PWR accounts for a majority of the “transition zone” that lies between the saprolite and the competent bedrock. For geotechnical borings in which SPTs were performed, saprolite that exceeds 50 blows per 6 inches was considered PWR.

2.3.2.3 Bedrock

Competent bedrock at the Site is primarily composed of schist, gneiss, quartzite, and amphibolite. There are five mapped bedrock units that underlie the Site: Schist-Amphibolite, Biotite Gneiss, Amphibolite, Sheared Button Schist, and the Long Island Creek Gneiss, as shown in **Figure 2-5**. The top of rock ranges in depth from a few feet below ground surface to 56 feet below ground surface. The rock consists of interbedded dark gray greenish gray augen schist, mica garnet schist and black and white to gray to pink and gray augen gneiss and biotite gneiss. Veins of calcite are present throughout the rock in the form of in-filled fractures, along with trace amounts of pyrite. Natural fractures in the rock often show signs of weathering and iron oxide staining as a result of water movement through the fractures. A more detailed discussion of the properties of the various rock types observed at the Site is included in **Appendix H**.

Geologic mapping was conducted in 2015 by Petrologic Solutions, Inc., and identified the primary shear foliation of the metamorphic bedrock units as well as the primary joint sets at and in the vicinity of the Site. The average foliation at the Site strikes N43°E and dips 53° to the southeast (SE), which is consistent with regional patterns and trends. Additionally, three major joint sets were identified. The three joint sets are:

- A dip joint striking at N51°W and dipping 79°NE;
- A strike joint striking N39°E and dipping 72°NW; and
- An oblique joint striking N89°W and dipping 87°NE.

Descriptions of these features and stereonet analysis of the foliation and joints are included in Section 3.4 of **Appendix H**. In December 2023 Geosyntec identified bedrock outcrops near Cells 2 and 3, and along the perennial stream in the area of the proposed landfill expansion. Foliation and joints were measured in the field by a Geosyntec geologist using a Brunton compass and evaluated for strike and dip of the foliation and joint planes. These outcrop locations are shown in **Figure 2-5**. Foliation and joint orientations ranged from N28°E to N61°E strike, and dipping from 20° to 77°SE. These measurements are consistent with the previous investigations performed by Petrologic in 2015.

Top of rock is weathered but becomes more competent with depth. Rock quality designation (RQD) of rock cores collected during drilling ranged from 42 to 97 percent with an average of 74 percent. The quality of the rock increases significantly with depth. The top of bedrock surface at the Site is irregular, with elevations estimated to range from about 610 to 840 feet NAVD88 as shown in **Figure 2-6**.

2.4 Description of Unconfined Aquifers

The uppermost aquifer at the Site is an unconfined regional groundwater aquifer that occurs primarily in the regolith, PWR, and upper fractured bedrock (i.e. transition zone). Generally, the water table surface at the Site is a subdued reflection of topography. At the Site scale, groundwater generally flows from the west side of the Site to the east-southeast side toward the Chattahoochee River. Localized groundwater flow directions are influenced by variations in natural topography, the geometry of the existing CCR Landfill, and the top of bedrock surface.

Recharge to the aquifer is primarily by way of precipitation. Groundwater discharge occurs as baseflow to local streams and ultimately to the Chattahoochee River. A precipitation gauge is located on the Plant property. From the past two years (January

2020 to January 2022) the Plant has received an average of 5.41 inches of rain per month, with a daily average of 0.18 inches[1].

Groundwater levels were collected monthly from all Site piezometers and monitoring wells for a one-year period (February 2022 to January 2023), and the groundwater depth and elevation data are summarized in **Table 2-4**. A potentiometric surface map was generated from water level measurements collected on 24 March 2022, which represents the seasonal high groundwater elevations observed in the one-year period. The groundwater elevation measurements from this event are presented in **Figure 2-7**. Depths to groundwater vary considerably across the Site from approximately four feet in low lying areas to 50 feet in the higher topographic elevations. The potentiometric surface map illustrates that groundwater flow is generally away from the topographic high near the west side of the Site and toward the east-southeast.

Recharge to water bearing fractures in the bedrock aquifer system comes primarily from water stored in the regolith. The regolith soil allows for slow infiltration to the bedrock through areas of enhanced permeability. The rate of this infiltration is generally considered to be slow, as the silty, clay-rich sandy soils are present across most of the Site and retard downward seepage into the underlying bedrock aquifer system. The crystalline bedrock beneath the Site lacks a primary porosity, restricting water flow within the bedrock to only the interconnected network of fractures.

2.5 Description of Confined Aquifers

No confined aquifers were encountered at the Site. As is typical of the southern Piedmont province, the groundwater systems are generally unconfined. Localized semi-confined conditions may be encountered as a result of perched groundwater, isolated lenses of low-permeability soils, or poorly interconnected fracture networks in the bedrock.

2.6 Potential of Unconfined (and Confined) Aquifers as Sources of Drinking Water

The unconfined aquifer at the Site is a potential source of drinking water. A drinking water supply and well survey was completed as part of previous investigations at the Site and was discussed in Section 1.10. This survey identified 23 potential private drinking water wells that may be screened within the unconfined aquifer. However, it should be

[1] Data from the Georgia Weather.net web database: www.georgiaweather.net/index.php

noted that the Site is not located in an area of significant groundwater recharge, and the potential drinking water wells are hydraulically separated from the Site by groundwater divides or discharge zones.

2.7 Description of Geologic and/or Natural Hazards, Seismic Impact Zones

Circular 14 presents siting criteria for fault areas, seismic impact zones, and unstable areas. Four faults are located near the Site. Details of the faults as well as the seismic impact zones and unstable areas are described in greater detail below.

2.7.1 Faults

Circular 14 requires special considerations for new landfill units and lateral expansions of existing landfills which are located within 200 feet of a fault that has had displacement in Holocene time (within the last approximately 12,000 years). Two regional faults, the Long Island Creek Fault and Katy Creek Fault, lie within the permit boundary for the existing CCR Landfill and are shown on the geologic map in **Figure 2-5**. These faults are ancient (molded 280+ million years ago), and no longer active. Holocene movement related to these faults has not been observed and is highly unlikely (Golder, 2018), and therefore this siting restriction does not apply.

The formation of both the Long Island Creek and Katy Creek Faults occurred at great depth under high confining pressures and temperatures. This resulted in ductile deformation, rather than brittle deformation, of the rock. Any brecciation or fracturing that occurred along these faults was remolded and mineralized by the heat, pressure, and silica-rich fluids in the Brevard Zone. There is no enhanced permeability or preferential groundwater flow pathways expected along the Long Island Creek or Katy Creek Fault zones (Golder, 2018).

2.7.2 Seismic Impact Zones

Circular 14 restricts the siting of landfills in seismic impact zones, unless it is demonstrated that containment structures, including liners, leachate collection systems, and surface water control systems are designed to resist the maximum horizontal acceleration in lithified earth material at the Site. A seismic impact zone, as defined in Circular 14, is an area with a ten percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10g in 250 years (i.e., a 2 percent or greater probability that the maximum horizontal acceleration in lithified earth material will exceed 0.10g in 50 years). A seismic hazard map obtained from https://earthquake.usgs.gov/hazards/interactive/ (Petersen et al., 2014) for a portion of Georgia including the Site is included in **Figure 2-8**. The map depicts peak ground acceleration contours (as a percentage of g), in which the contours represent an event with a 2 percent or greater probability of exceedance in 50 years. Based on this map and the calculations, the Plant property and Site are located within a zone with a peak ground acceleration of 0.1612g (i.e., greater than 0.10g). Therefore, the Site is located within a seismic impact zone. Based on this evaluation, engineering measures appropriate to resist the maximum horizontal acceleration in lithified earth material at the Site will be implemented as part of the design of the proposed expansion of the CCR Landfill.

2.7.3 Unstable Areas

Circular 14 requires that engineering measures be incorporated into the Site design to ensure the integrity of the structural components of the landfill unit if the Site is located in an unstable area. An unstable area, as defined in Circular 14, is a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity of some or all of the landfill structural components responsible for preventing releases from a landfill, and can include poor foundation conditions, areas susceptible to mass movements, and karst terrains.

The Site is located in the Piedmont Physiographic Province and is underlain by saprolite of the metamorphic rock that makes up the bedrock. The saprolite typically consists of silty or clayey sand. This type of material is not prone to differential settling. There is also no evidence that any area of the Site is susceptible to mass movements. This region does not contain natural sinkholes, collapsible soils, or thick organic deposits. The Site does not include natural or human-made features that are known to be unstable areas. The design, construction, and operation of the CCR Landfill expansion is not anticipated to create unstable conditions.

In areas beneath the proposed CCR Landfill expansion, namely the perennial stream that is planned for realignment, alluvial material may be present that could constitute weak or poor foundation soils. These soils, should they be encountered, are to be removed and replaced with properly compacted structural fill prior to construction of the base grades for the proposed new landfill cell (Cell 4) to ensure proper foundation soils.

3. PATHWAY ANALYSIS

3.1 Description of the Interrelationship Between the Vadose Zone, the Uppermost Aquifer, and Deeper Aquifers

Groundwater recharge at the Site is primarily from infiltration of rainfall. Precipitation percolates through the vadose zone to the unconfined surficial aquifer, which occurs in the regolith and the transition zone of PWR and upper fractured bedrock. Vadose zone thickness at the Site ranges from approximately four to 50 feet as indicated by depth to water measurements in Site wells and piezometers. Interconnected fractures in the transition zone transmit groundwater stored in the regolith soils to the underlying bedrock. The regolith and transition zone are interconnected and act as one aquifer system, and the movement of groundwater in this system can generally be described as a low- to moderate-permeability porous media flow. The bedrock becomes more competent (with few to no fractures) with depth and groundwater flow is expected to be very limited. Therefore, there is no recognized deeper or confined aquifer unit at the Site.

Seasonal fluctuations in groundwater levels were evaluated using historical groundwater level data available for 40 wells/piezometers in the Site vicinity. These wells/piezometers include the monitoring well network (35 wells) within the existing CCR permit boundary and the five piezometers installed by Geosyntec in 2021-2022. The media in which these wells/piezometers are screened is presented in **Table 2-1**. Following collection of monthly groundwater levels between February 2022 and January 2023, the ranges were compared to the historical data at the Site. Based on this data, the seasonal water levels fluctuate from as little as one foot to as much as 17 feet, with the spring months (March and April) exhibiting the highest groundwater elevations. The potentiometric surface map in **Figure 2-7** represents the seasonal high groundwater levels, measured in March 2022.

3.2 Calculated Groundwater Flow Velocities

3.2.1 Hydraulic Conductivity

Hydrogeologic data was collected during the 2006 and 2021-2022 field investigations. Slug testing was performed at seven piezometers (GS-3, GS-4, GS-18, GS-21, GS-25, GS-27, and GS-29) in 2006 and at four piezometer locations (GS-101, GS-102, GS-103, and GS-104) in 2022. Each of the eleven slug tests was evaluated using the Bouwer-Rice method [1989] and the resulting data plots are included in **Appendix I**.

The maximum, minimum, and geometric mean of the K_h for piezometers screened within each lithologic group were calculated. The values were similar for slug tests conducted on piezometers screened entirely within regolith and the regolith/bedrock transition zone. The K_h values for slug tests conducted on bedrock piezometers were the highest of the lithologic zones, however, it should be noted that tests from one piezometer (GS-4) were anomalously high and greatly influenced the mean value.

For the regolith piezometers, the K_h ranged from 1.11 x 10^{-3} to 6.18 x 10^{-5} cm/sec (0.18 to 3.14 ft/day), with a geometric mean of 2.23 x 10^{-4} cm/sec (0.63 ft/day). The results of the two piezometers screened within the regolith/bedrock transition zone yielded a range of 1.24 x 10^{-4} to 7.82 x 10^{-5} cm/sec (0.22 to 0.35 ft/day), and a geometric mean K_h of 9.93 x 10^{-5} cm/sec (0.28 ft/day). The bedrock piezometers ranged from 3.62 x 10^{-2} to 1.76 x 10^{-4} cm/sec (0.5 to 102.64 ft/day) with a geometric mean of 1.19 x 10^{-3} cm/sec (3.39 ft/day). The overall range and mean for all piezometers combined was 3.62 x 10^{-2} to 6.18 x 10^{-5} cm/sec (0.18 to 102.64 ft/day) and 2.98 x 10^{-4} cm/sec (0.84 ft/day), respectively. A summary of the slug test results, both historical (SCS) and recent (Geosyntec), is presented in **Table 3-1**.

Undisturbed Shelby tube samples from 20 locations collected during the 2006 site investigation and two locations during the 2021-2022 investigation were used to evaluate vertical hydraulic conductivity (K_v) of the regolith material. The K_v estimates ranged from 1.7 x 10^{-7} to 2.3 x 10^{-4} cm/sec (0.0005 to 0.65 ft/day) with a geometric mean of 7.1 x 10^{-6} cm/sec (0.02 ft/day). The vertical hydraulic conductivity values are summarized with the laboratory results in **Table 2-3**.

3.2.2 Hydraulic Gradient and Groundwater Flow Velocity

Circular 14 recommends calculation of groundwater flow velocity based on the Darcy Equation, using representative hydraulic gradients and effective porosity values, and both average and maximum measured hydraulic conductivity values for the pathway analysis. The representative hydraulic gradient for the Site taken from the 24 March 2022 potentiometric surface map (**Figure 2-7**) is the average of three measurements, one spanning west to east (GWA-28 to GWC-16) across the entire Site (0.030 ft/ft), one trending west to east (GWA-28 to GWC-7) in the central part of Site (0.048 ft/ft), and the last measurement trending from the central part of the Site to the northeast (GWA-2 to GWC-16) across the east part of the Site (0.035 ft/ft).

The average of these three gradients, 0.038 ft/ft, was used to estimate groundwater flow velocities at the Site. Based on slug testing data the average conductivity (K_h) is 0.84

ft/day. The material making up a majority of the aquifer was classified as a sandy silt. A literature value for the effective porosity of a typical sandy silt is 0.15 (Maidment, 1993). The resulting groundwater flow velocity is as follows:

$$v = \frac{(0.84\ ft/day)(0.038\ ft/ft)}{0.15} = 0.21\ ft/day$$

These calculations yielded a groundwater flow velocity of 0.21 ft/day for typical Site conditions.

Groundwater velocity calculations for the highest observed conditions[2] were performed using the maximum k_h of 3.14 ft/day, an average hydraulic gradient of 0.038 ft/ft, and an assumed effective porosity of 0.15. These calculations yielded a groundwater flow velocity of 0.80 ft/day in "worst-case" conditions.

3.3 Groundwater Pollution Potential

According to the Ground-Water Pollution Susceptibility Map of Georgia [Georgia Geologic Survey, 1992b], the Site is located in a "lower" groundwater pollution susceptibility area. There is an area of thick soils in the vicinity of the Plant as shown on **Figure 1-3**, but it is approximately 2.5 miles southwest and upgradient of the Site.

Several factors influence the migration rate and concentration potential of leachate from a solid waste disposal facility. To evaluate the potential for groundwater pollution, the velocity of groundwater movement and the ability of the soil to reduce contamination by biological and chemical attenuation are predicted in part by soil permeability, clay content, cation exchange capacity (CEC) or sorption capacity, and pH. In addition, the Pollution Potential Method of LeGrand [LeGrand, 1964] is used to estimate the likelihood of groundwater pollution affecting domestic water wells and municipal water supply sources. The degree of chemical attenuation is dependent on the composition of the leachate, the interaction of the leachate with the soil, and the length of the time this interaction takes place, which is primarily a function of permeability and overburden thickness.

In order to better estimate the sorption properties of the saprolite at the Site, soil samples were collected as part of the 2006 site investigation and analyzed for CEC, which is a

[2] The estimated K_h from piezometer GS-4 was considered anomalous and was not used for this calculation to represent the maximum observed value. The next highest value (GS-21) was used in its place.

measure of the ability of the soil to hold exchangeable cations. Samples were collected from three locations (GS-2, GS-13, and GS-19) at depths ranging from one to seven feet below ground surface. The results of the analyses were consistent with each other, with values between 13.8 milliequivalents/100 grams (mEq/100g) and 27.4 mEq/100g, showing some capacity to retain cations.

3.3.1 LeGrand Pollution Potential Method

The LeGrand Pollution Potential Method is used to evaluate the potential impact to nearby drinking water wells or human receptors. The LeGrand method uses a scoring system to assign points to the following site properties under natural conditions:

- Depth to water table;
- Attenuation capacity of soils;
- Aquifer permeability;
- Water table gradient; and
- Thickness of unconsolidated material.

The points assigned to each feature are added for a total point score. The higher the total points, the less likely the potential for pollution, according to the scoring system. The LeGrand system is a conservative method of evaluation since its scoring system was developed prior to the advent of modern liner systems that are much less likely to leak.

The Site of the proposed expansion to the existing CCR Landfill is a “two-media” site characterized by unconsolidated material at ground surface underlain by bedrock. For a two-media site, factors affecting pollution potential include water table depth (WT), sorption capacity (S), permeability (P), gradient (G), distance to point of water use (D), and thickness of unconsolidated materials (T) [McLemore and Perriello, 1997]. Using the rating chart provided in Circular 14 for two-media sites, numerical scores for the Site in its natural state were assigned as follows:

- Under current conditions, the Site has a water table that is more than five feet below the bottom of the liner of the existing CCR Landfill. The proposed expansion will be constructed such that a minimum of five feet of separation between the bottom of the liner system and the water table will be maintained across the Site. Therefore, for scoring purposes, a water table depth below waste of five feet was used, resulting in a WT score of 0.3 points.

- Sorption scoring (S) used a regolith comprised primarily of silt size grains based on geotechnical lab data presented in Section 2.2. The sorption score plotted at Equal Amounts of Clay and Sand. This resulted in a S score of 3 points.

- Permeability scoring (P) also used a regolith comprised of sandy silt and was placed between "Silt or Sandy Clay" and "Clayey Sand" categories on the scale. This resulted in a P score of 2.5 points.

- Hydraulic gradients (G) average just under 4 percent across the Site toward the Chattahoochee River, east of the Site. This is in a favorable direction as it is away from any possible receptor wells as described in Section 1.9. This resulted in a G score of 4.1 points.

- The distance from the waste boundary to the nearest potential receptor (D) of 700 feet was used based on the location of the closest potential private drinking water well identified in the 2019 NewFields well survey discussed in Section 1.10. This resulted in a D score of 4.5 points. This is a conservative score since this and other potential domestic wells inside of the ½ mile radius appear to be hydraulically upgradient of the Site.

- The thickness of the porous media below the waste material (T) is considered to include the regolith and PWR. The thickness of these two units combined ranges from a few feet in thickness to approximately 56 feet, with an average thickness of 36 feet. This resulted in a T score of 2 points.

Circular 14 states that additional points may be given for engineered sites using clay or composite liners and/or leachate collection systems, since the LeGrand method only considers natural site conditions. Following the guidance of Circular 14, the proposed expansion to the CCR Landfill was scored for its use of an existing composite liner and leachate collection system, which allows for maximum sorption (4 points), a favorable water table gradient, and a permeability rating of 3 points. The LeGrand method calculates a "possible, but not likely" pollution potential for the Site under both natural and engineered conditions (with composite liner and leachate collection system). A summary of the LeGrand scoring is included in **Table 3-2**.

3.4 Description of the Interrelationship Between Groundwater Flow Directions and Potential Receptors

Inspection of the 24 March 2022 potentiometric surface map (**Figure 2-6**) indicates groundwater flow at the Site to be from the west to the east-southeast toward the Chattahoochee River. The well surveys performed by NewFields in 2019 and Geosyntec in 2022 identified 23 potential private drinking water wells within ½ mile of the Site, the closest of which is approximately 700 feet to the south of the existing CCR Landfill. No public water supply wells were identified within two miles of the proposed expansion. Furthermore, it should be noted that all of the potential private wells identified by the surveys are upgradient of the Site and therefore have a very low potential to be impacted by groundwater from the Site.

3.5 Estimated Travel Time for Leachate to Reach Potential Receptors

The closest potential private drinking water well to the Site boundary is hydraulically upgradient of the Site. Conservatively estimating potential receptors, groundwater travel time is calculated based on the proximity of this well, which is located 700 feet from the Site. Travel time calculations for groundwater flow (leachate) from the Site to reach the potential receptor were performed using the Darcy Equation for groundwater flow velocity, as described in Section 3.2.2, and the relationship for time/distance velocity.

The input parameters and calculations are summarized in **Table 3-3**. The travel time for leachate to reach the potential receptor located approximately 700 feet from the Site is nine years for the average case and three years for the “worst case”, assuming an unlikely scenario where the flow direction changes toward this receptor. Both of these travel time scenarios also conservatively assume that an unlikely event of leachate release through the composite liner system has occurred, therefore, the liner permeability is not factored into this travel time. Previous modeling performed by SCS (2007) estimated the time for potential contaminants to travel vertically through the compacted clay portion of the liner system and through a minimum of five feet of saprolite vadose zone soil to the top of the uppermost aquifer. Modeling using both conservative and more likely site conditions (e.g., sorption coefficients, cation exchange, and intrinsic permeability) resulted in an estimated travel time of 575 to over 1,000 years for leachate to reach groundwater, in the unlikely event of a release through the composite liner.

3.6 Mitigation of Geologic and/or Natural Hazards

No evidence of geologic or natural hazards has been observed at the Site in the surface or subsurface investigations that would require mitigation. The Site is located within a seismic impact zone as described in Section 2.7.2, and the existing containment structures have been designed to resist the maximum horizontal acceleration expected at the Site. A Professional Engineer registered in the State of Georgia will certify that all existing and any new containment structures associated with the proposed expansion will be designed to resist the estimated maximum horizontal ground acceleration at the Site.

4. RECOMMENDATIONS FOR DESIGN

4.1 Unfavorable Areas

With the exception of the buffer areas discussed below and floodplain, stream, and wetland areas identified on **Figure 1-2**, there are no areas identified as unfavorable for siting of the CCR Landfill expansion. Any wetland and/or stream impacts, including stream relocation, will be permitted as required by the USACE 404 permitting process prior to disturbance. No karstic areas are present within the Piedmont province.

4.2 Seismic Impact Zone Considerations

As discussed in Section 2.7.2, the existing CCR Landfill is located in a seismic impact zone, as defined in Circular 14. The Plant property and Site are located within a zone with a peak ground acceleration of 0.1612g (i.e., greater than 0.10g). In accordance with the requirements in Circular 14 and the CCR Rule, engineering measures appropriate to resist the estimated maximum horizontal ground acceleration will be implemented as part of the design of the proposed expansion of the CCR Landfill.

4.3 Liner/Leachate Collection Systems

A liner and leachate collection system meeting the requirements of Georgia Solid Waste Rule 391-3-4-.10-4(a) is recommended.

4.4 Cell Depths (Including Relationship to Water Table)

Per USEPA 40 CFR §257.6, the liner system for the proposed expansion area will be designed to maintain a minimum 5-feet separation from the seasonal high groundwater elevations depicted on **Figure 2-7**. Following realignment of the perennial stream and construction of the proposed CCR Landfill expansion area, it is possible that groundwater levels may change. Given the reduction of recharge areas due to liner installation and the rerouting of the perennial stream including all upstream flow, an overall rise in groundwater levels is not expected. Topographically low areas may be addressed by installing underdrains similar in design to those used in the previously permitted and constructed cells at the Site. Such underdrains, if needed, will be designed to accommodate expected flows and keep groundwater from rising to within 5-feet of the bottom of the liner system. Additionally, structural fill may be used if needed to ensure that landfill base grades maintain a minimum 5-feet separation from the seasonal high groundwater elevations.

4.5 Site Drainage and Erosion Control

The proposed landfill expansion will be designed and constructed to minimize soil erosion and sediment migration. Diversion ditches, berms, piping, silt fencing, and sedimentation ponds will be included as needed to prevent site runoff from entering waste disposal areas and sediments from leaving the Site. Areas where soil disturbing activities take place will be stabilized as soon as practical.

4.6 Buffer Zones

A minimum 200-foot undisturbed buffer will be provided between the CCR permit boundary and the limit of waste for the expanded landfill Site in accordance with Solid Waste Rule 391-3-4-.10(3)(e). Planned infrastructure and modifications related to the landfill expansion are expected to encroach on parts of this undisturbed buffer. These activities are temporary, and the associated encroachments will be outlined in a minor modification to the landfill permit, submitted under separate cover, as discussed with GAEPD.

Wetlands and streams within the proposed CCR Landfill expansion area will be relocated or managed in accordance with the USACE 404 permitting process. Any additional wetlands or streams in the vicinity of the expansion area, if present, will maintain applicable buffers. Additionally, applicable buffer zones, such as a minimum 500-foot buffer between the waste disposal boundary and any occupied dwelling and associated operational domestic water supply well in existence on the date of permit application, will also be provided, if applicable, in accordance with Solid Waste Rule 391-3-4-.10(3)(e). There are no dwellings or domestic water supplies located within 500 feet of the proposed expanded waste disposal area at this time.

4.7 Monitoring Network

Monitoring wells will be added to the existing monitoring network in the vicinity of the expansion area as necessary to monitor the quality of groundwater at the Site. The design of the groundwater monitoring system will conform to standards outlined in the GAEPD Manual for Groundwater Monitoring [GAEPD, 1991]. Monitoring of the wells and surface water monitoring points will be conducted in accordance with the Solid Waste Rules, Chapter 391-3-4-.10.

Background and downgradient water quality must be monitored to determine if the landfill is impacting the water quality traveling under the Site. Stormwater monitoring, if necessary, will be conducted in accordance with the appropriate the National Pollutant Discharge Elimination System (NPDES) Permit.

4.8 Disposition of Borings

The temporary piezometers constructed during the 2021-2022 Geosyntec field investigation and any other monitoring well or piezometer located within the footprint of any area affected by the expansion of the existing CCR Landfill will be abandoned in accordance with the Water Well Standards Act and recommendations in the Manual for Groundwater Monitoring [GAEPD, 1991], following review of this document and receipt of a letter of site suitability.

5. REFERENCES

Bouwer, H., 1989. *The Bouwer and Rice slug test – An update*. Ground Water, vol. 27, no. 3. Pp. 304-309.

Carroll County Department of Community Development, 2018. Compressive Plan 2018 Update. Website: https://www.carrollcountyga.com/618/2018-Comprehensive-Plan, Last accessed March 2, 2022.

Ecological Solutions, Inc., 2022. Ecology Survey Report, Georgia Power Company, Plant Wansley, Carroll County, Georgia. April 2022.

Federal Emergency Management Agency, 2017. Flood Map Service Center. Website: https://msc.fema.gov/, last accessed April 2022.

GAEPD, 1991. *Manual for Groundwater Monitoring*. Georgia Department of Natural Resources, Environmental Protection Division. 38p.

Georgia Geologic Survey, 1992a. Hydrologic Atlas (HA)-18 Most Significant Ground-Water Recharge Areas of Georgia.

Georgia Geologic Survey, 1992b. Hydrologic Atlas (HA)-20 Ground-Water Pollution Susceptibility Map of Georgia.

Golder Associates, 2018. *Geologic and Hydrogeologic Report*. Georgia Power – Plant Wansley, Carroll and Heard Counties, Georgia. November 2018.

Hvorslev, M.J., 1951. *Time Lag and Soil Permeability in Ground-Water Observations*. Waterways Exper. Sta. Corps of Engineers. U.S. Army, Vicksburg, Mississippi. Bulletin No. 36, pp. 1-50.

LeGrand, H.E., 1964. *System for Evaluation of Contamination Potential of Some Waste Disposal Sites*. American Water Works Association Journal 56(8), pp. 959-974.

Maidment, David R. (editor). (1993) Handbook of Hydrology. Table 16.2.1, p. 16.2, McGraw Hill.

McLemore, W.H. and P.D. Perriello, 1997. *Criteria for Performing Site Acceptability Studies for Solid Waste Landfills in Georgia, Circular 14*. Georgia Department of Natural Resources, Environmental Protection Division. September 1991 (amended 1997).

Official Code of Georgia Annotated, 12-5-120 through 138, 1985. *Water Well Standards Act of 1985.*

Petersen, M.D., Moschetti, M.P., Powers, P.M., Mueller, C.S., Haller, K.M., Frankel, A.D., Zeng, Y., Rezaeian, S., Harmsen, S.C., Boyd, O.S., Field, N., Chen, R., Rukstales, K.S., Luco, N., Wheeler, R.L., Williams, R.A., and Olsen, A.H., 2014. "*Documentation for the 2014 Update of the United States National Seismic Hazard Maps*," Open-File Report 2014-1091, U.S. Geological Survey, Reston, VA.

SCS, 2007. Plant Wansley Proposed Coal Combustion By-Product Disposal Facility- Site Acceptability Report. Southern Company Services – Earth Science and Environmental Engineering. October 2007

U.S. Census Bureau, 2021. County Population Totals: 2010-2020. Website; https://www.census.gov/programs-surveys/popest/technical-documentation/research/evaluation-estimates/2020-evaluation-estimates/2010s-counties-total.html, Last Accessed March 4th, 2022

U.S. Geological Survey, 2014. *Dynamic: Conterminous U.S. 2014 (v4.1.1) Interactive Deaggregations.* Website: https://earthquake.usgs.gov/ hazards/interactive/, last accessed January 2019. Based on Peterson, et al., 2014 (see above reference).

TABLES

Table 2-1
Well and Piezometer Location and Construction Details
Plant Wansley CCR Landfill
Carroll and Heard Counties, Georgia

Well/Piezometer ID	Easting[1]	Northing[1]	Ground Surface Elevation[2] (ft NAVD88)	TOC Elevation[2] (ft NAVD88)	Top of Screen Elevation[2] (ft NAVD88)	Bottom of Screen Elevation[2] (ft NAVD88)	Well Depth (ft bgs)	Monitoring Designation	Screened Media
Groundwater Monitoring Wells									
GWA-1	2027869.5	1236939.1	774.85	778.02	738.45	728.45	49.9	Upgradient	Saprolite
GWA-2	2027481.9	1237146.1	812.93	816.16	766.23	756.23	60.1	Upgradient	Saprolite
GWA-3	2027159.5	1237239.2	786.82	790.64	769.12	759.12	31.2	Upgradient	Bedrock
GWA-4	2026749.0	1237253.8	776.28	779.54	753.28	743.28	40.6	Upgradient	PWR
GWA-28	2025183.3	1237994.3	846.25	849.16	813.55	803.55	45.8	Upgradient	Bedrock
GWA-29	2024982.9	1238288.6	831.67	834.67	787.87	777.87	57.1	Upgradient	Bedrock
GWC-5	2026715.5	1237691.3	752.92	755.91	725.22	715.22	40.7	Downgradient	PWR
GWC-6	2027012.5	1237923.3	746.70	749.98	729.00	719.00	31.1	Downgradient	PWR
GWC-7	2027271.7	1238264.5	728.07	731.15	715.37	705.37	25.9	Downgradient	PWR
GWC-8	2027639.1	1238500.9	720.27	723.46	713.57	703.57	20.0	Downgradient	Bedrock
GWC-9	2027890.0	1238673.3	709.65	712.65	703.45	693.45	19.4	Downgradient	Bedrock
GWC10	2028307.6	1238950.9	705.87	709.41	697.77	687.77	22.0	Downgradient	Bedrock
GWC-11	2028591.5	1238931.3	697.73	701.05	693.03	683.03	18.2	Downgradient	Saprolite
GWC-12	2028921.3	1238739.9	721.09	724.06	693.89	683.89	40.6	Downgradient	Bedrock
GWC-13	2029289.1	1238623.8	690.83	694.08	616.13	606.13	90.4	Downgradient	Bedrock
GWC-14	2029551.6	1238429.7	688.56	692.63	678.56	668.56	24.6	Downgradient	Saprolite
GWC-15	2029813.0	1238164.6	684.51	687.44	646.81	636.81	51.1	Downgradient	Bedrock
GWC-16	2029989.9	1237810.5	686.85	690.32	673.45	663.45	27.0	Downgradient	Saprolite
GWC-17	2029802.8	1237469.4	701.30	704.55	661.30	651.30	53.3	Downgradient	Saprolite
GWC-18	2029693.0	1237098.5	697.19	700.31	679.99	669.99	30.5	Downgradient	Saprolite
GWC-19	2029324.6	1236842.3	696.80	698.47	672.60	662.60	38.6	Downgradient	PWR
GWC-20	2029150.8	1236646.2	702.55	706.29	644.85	634.85	71.1	Downgradient	Saprolite
GWC-21	2028635.0	1236231.3	717.37	721.02	693.07	683.07	38.3	Downgradient	Saprolite
GWC-22	2028325.8	1236394.6	740.99	744.17	677.29	667.29	77.2	Downgradient	Saprolite
GWC-23	2028089.7	1236656.2	770.42	773.41	715.72	705.72	68.1	Downgradient	Saprolite
GWC-24	2026408.8	1237354.4	787.13	790.37	749.23	739.23	51.1	Downgradient	Saprolite
GWC-25	2026090.2	1237403.3	809.18	812.36	761.18	751.18	61.2	Downgradient	Bedrock
GWC-26	2025790.8	1237623.5	782.49	785.60	736.29	726.29	59.4	Downgradient	PWR
GWC-27	2025523.4	1237827.7	811.24	814.32	753.54	743.54	70.8	Downgradient	PWR
GWC-30	2025117.6	1238566.2	788.45	791.10	751.75	741.75	49.6	Downgradient	Saprolite
GWC-31	2025617.6	1238700.6	793.62	797.50	770.02	760.02	38.0	Downgradient	Bedrock
GWC-32	2025875.0	1238775.1	782.17	785.38	764.47	754.47	31.1	Downgradient	Bedrock
GWC-33	2026322.0	1238819.2	757.04	760.05	746.34	736.34	24.0	Downgradient	PWR/Bedrock
GWC-34	2026570.3	1238558.9	731.84	735.40	694.64	684.64	51.3	Downgradient	PWR/Bedrock
GWC-35	2026822.3	1238244.6	728.11	730.64	700.41	690.41	40.8	Downgradient	PWR/Bedrock
Temporary Water Level Piezometers[(3)]									
GS-101	2026776.3	1239073.0	755.12	757.29	715.12	705.12	50.3	Site-wide Water Levels	PWR
GS-102	2026891.1	1238540.1	761.68	764.85	727.68	717.68	44.3	Site-wide Water Levels	PWR/ Bedrock
GS-103	2027276.1	1239177.4	772.08	773.90	725.08	715.08	57.3	Site-wide Water Levels	Saprolite
GS-104	2027282.4	1238728.1	728.10	732.55	708.10	698.10	30.3	Site-wide Water Levels	Saprolite
GS-105	2027727.2	1238911.7	733.34	735.65	725.34	715.34	18.3	Site-wide Water Levels	Saprolite/Bedrock
Historical Piezometers (Abandoned) [(4)]									
GS-1	2023921.8	1238147.8	847.7	850.3	808.0	798.0	54.7	Temporary Water Levels (Abandoned)	Bedrock
GS-2	2024760.5	1237856.2	834.2	837.1	798.5	789.5	45.7	Temporary Water Levels (Abandoned)	Bedrock
GS-3	2024864.7	1238337.1	803.2	806.3	764.7	754.7	48.5	Temporary Water Levels (Abandoned)	Saprolite
GS-4	2025555.3	1238570.9	805.9	809.0	780.4	771.4	35.5	Temporary Water Levels (Abandoned)	Bedrock
GS-5	2026220.1	1238797.0	773.1	776.0	752.5	742.5	30.8	Temporary Water Levels (Abandoned)	Bedrock
GS-6	2026022.5	1238189.4	767.1	769.7	737.1	727.1	41.5	Temporary Water Levels (Abandoned)	Saprolite
GS-7	2025643.0	1237419.6	794.7	797.4	739.7	729.7	66.5	Temporary Water Levels (Abandoned)	Saprolite
GS-8	2026576.3	1237314.2	766.5	769.4	749.1	739.1	37.4	Temporary Water Levels (Abandoned)	PWR/Bedrock
GS-9	2027036.9	1237640.6	772.7	776.4	757.7	747.7	35.5	Temporary Water Levels (Abandoned)	Bedrock
GS-10	2027008.5	1238583.6	761.4	764.2	733.7	723.7	51.8	Temporary Water Levels (Abandoned)	Bedrock
GS-11	2027081.8	1239140.5	773.9	776.6	723.4	713.4	60.5	Temporary Water Levels (Abandoned)	Saprolite
GS-12	2027471.4	1239064.2	773.2	775.7	703.7	693.7	81.0	Temporary Water Levels (Abandoned)	Saprolite
GS-13	2027246.4	1237295.0	780.6	784.0	768.1	758.1	37.5	Temporary Water Levels (Abandoned)	Bedrock
GS-14	2028315.3	1239460.6	737.7	740.8	717.2	707.2	45.5	Temporary Water Levels (Abandoned)	Bedrock
GS-15	2028782.9	1239617.3	719.7	722.6	699.7	689.7	41.3	Temporary Water Levels (Abandoned)	Bedrock
GS-16	2029067.9	1239205.2	710.5	713.1	680.5	670.5	40.0	Temporary Water Levels (Abandoned)	Bedrock
GS-17	2027569.5	1237971.7	756.1	758.8	715.7	705.7	50.4	Temporary Water Levels (Abandoned)	Bedrock
GS-18	2027638.3	1238342.8	731.6	733.5	724.1	714.1	32.5	Temporary Water Levels (Abandoned)	Bedrock
GS-19	2028069.8	1238392.9	750.0	752.9	735.8	725.8	39.2	Temporary Water Levels (Abandoned)	Bedrock
GS-20	2028418.9	1238812.9	713.8	716.6	685.3	675.3	43.5	Temporary Water Levels (Abandoned)	Saprolite
GS-21	2028695.2	1238101.4	789.4	792.1	731.9	721.9	72.5	Temporary Water Levels (Abandoned)	Saprolite
GS-22	2029031.2	1238610.8	729.3	732.7	672.3	662.3	72.0	Temporary Water Levels (Abandoned)	Saprolite
GS-23	2029786.7	1237682.9	697.9	700.7	667.9	657.9	50.0	Temporary Water Levels (Abandoned)	Saprolite
GS-24	2029589.1	1238255.5	725.0	728.2	699.5	659.5	65.5	Temporary Water Levels (Abandoned)	Saprolite
GS-25	2028247.1	1237863.9	785.7	788.5	752.0	742.0	43.7	Temporary Water Levels (Abandoned)	Bedrock
GS-26	2028878.0	1237263.4	744.7	748.1	669.7	689.7	60.0	Temporary Water Levels (Abandoned)	Saprolite
GS-27	2029687.5	1237224.5	699.7	702.7	674.7	664.7	40.0	Temporary Water Levels (Abandoned)	Saprolite/Bedrock
GS-28	2028007.0	1237344.9	813.4	816.4	759.4	749.4	64.0	Temporary Water Levels (Abandoned)	PWR
GS-29	2028298.2	1236554.0	746.7	749.7	707.7	697.7	49.0	Temporary Water Levels (Abandoned)	Saprolite
GS-30	2028993.8	1236619.1	714.6	717.5	680.1	670.1	56.5	Temporary Water Levels (Abandoned)	Saprolite
GS-31	2025212.8	1237996.6	843.5	846.4	823.0	813.0	43.5	Temporary Water Levels (Abandoned)	Saprolite/Bedrock

Notes:
ID = Identification
TOC = Top of Casing
PWR = Partially Weathered Rock
ft bgs = Feet below ground surface
1. Northings and Eastings are based on the North American Datum of 1983 (NAD83) Georgia State Plane, West zone, US Survey Foot; and are reported to the nearest 0.1 ft.
2. Elevations provided are based on the North American Vertical Datum of 1988 (NAVD88)
3. Temporary piezometers were installed by Geosyntec from December 2021 to January 2022. Elevations are reported to the nearest 0.01 ft.
4. Historical piezometers were abandoned after collecting seasonal water levels from November 2006 through September 2007. Vertical elevation data for these locations available only to the nearest 0.1 ft.

Table 2-2
Geotechnical Boring Location Summary
Plant Wansley CCR Landfill
Carroll and Heard Counties, Georgia

Boring ID	Easting[1]	Northing[1]	Ground Surface Elevation (ft NAVD88)[2]	Bottom of Boring Elevation (ft NAVD88)[2]	Boring Depth (ft bgs)	Depth to Bedrock (ft bgs)
Geotechnical Borings						
GS-1	2023921.8	1238147.8	847.7	793.0	54.2	39.2
GS-2	2024760.5	1237856.2	834.2	788.5	45.7	21.2
GS-3	2024864.7	1238337.1	803.2	754.7	50.0	NE
GS-4	2025555.3	1238570.9	805.9	770.4	35.5	17.0
GS-5	2026220.1	1238797.0	773.1	742.3	31.6	10.0
GS-6	2026022.5	1238189.4	767.1	725.6	41.5	NE
GS-7	2025643.0	1237419.6	794.7	728.2	66.5	NE
GS-8	2026576.3	1237314.2	766.5	729.1	37.4	16.3
GS-9	2027036.9	1237640.6	772.7	737.2	35.5	15.5
GS-10	2027008.5	1238583.6	761.4	709.6	51.8	30.0
GS-11	2027081.8	1239140.5	773.9	713.4	61.0	NE
GS-12	2027471.4	1239064.2	773.2	692.2	81.0	NE
GS-13	2027246.4	1237295.0	780.6	743.1	37.5	12.5
GS-14	2028315.3	1239460.6	737.7	692.2	44.5	NE
GS-15	2028782.9	1239617.3	719.7	678.4	41.3	21.0
GS-16	2029067.9	1239205.2	710.5	670.5	40.1	26.9
GS-17	2027569.5	1237971.7	756.1	705.7	50.4	30.0
GS-18	2027638.3	1238342.8	731.6	699.1	32.5	7.4
GS-19	2028069.8	1238392.9	750.0	710.8	39.2	15.2
GS-20	2028418.9	1238812.9	713.8	670.3	43.5	NE
GS-21	2028695.2	1238101.4	789.4	716.9	77.5	66.0
GS-22	2029031.2	1238610.8	729.3	657.3	75.0	NE
GS-23	2029786.7	1237682.9	697.9	647.9	60.0	NE
GS-24	2029589.1	1238255.5	725.0	659.5	65.5	NE
GS-25	2028247.1	1237863.9	785.7	742.0	43.7	29.0
GS-26	2028878.0	1237263.4	744.7	684.7	60.0	50.5
GS-27	2029687.5	1237224.5	699.7	659.7	35.0	NE
GS-28	2028007.0	1237344.9	813.4	749.4	64.0	NE
GS-29	2028298.2	1236554.0	746.7	694.7	50.0	NE
GS-30	2028993.8	1236619.1	714.6	658.1	56.5	NE
GS-31	2025212.8	1237996.6	843.5	800.0	43.5	23.5
GS-101	2026776.34	1239073.05	755.12	704.12	51.0	50.0
GS-102	2026891.14	1238540.08	764.85	717.85	47.0	38.0
GS-103	2027276.15	1239177.40	772.08	714.08	58.0	56.0
GS-104	2027282.00	1238728.13	728.10	677.10	51.0	NE
GS-105	2027727.21	1238911.67	733.34	712.34	21.0	14.0
GS-106	2026475.03	1238423.69	771.49	678.49	93.0	73.0
GS-107	2026599.33	1238066.27	763.37	676.37	87.0	68.0
GS-108	2027139.68	1237995.22	740.78	708.78	32.0	13.0
GS-109	2025182.74	1238291.65	843.77	839.77	4.0	2.0
GS-110	2026897.73	1239184.73	762.85	710.35	52.5	51.5
GS-111	2027019.34	1238936.50	748.72	734.72	14.0	12.5
GS-112	2027706.40	1239385.49	749.51	700.51	49.0	NE
GS-113	2026560.25	1237517.37	773.49	725.49	48.0	NE
GS-114	2027195.35	1237119.34	798.37	772.87	25.5	25.0
GS-115	2029556.40	1238263.98	731.15	667.65	63.5	63.0
GS-116	2028421.85	1236324.83	737.41	676.41	61.0	NE
GS-117	2028775.97	1236448.00	726.86	682.86	44.0	NE
GS-118	2029170.14	1236256.81	716.02	684.02	32.0	31.5
GS-119	2029350.03	1237037.05	711.44	663.44	48.0	NE
GS-120	2029707.84	1236725.26	709.80	675.80	34.0	32.5
GS-121	2030010.11	1237382.64	694.70	656.20	38.5	NE
GS-122	2027990.34	1239336.57	735.26	696.26	39.0	NE

Notes:
ID = Identification
ft bgs = Feet below ground surface
NE = Not Encountered

1. Northings and Eastings are based on the North American Datum of 1983 (NAD83) Georgia State Plane, West zone, US Survey Foot.

2. Elevations provided are based on the North American Vertical Datum of 1988 (NAVD88). The temporary piezometers were surveyed as-built by Thompson Engineering in February 2022.

3. Borings GS-1 to GS-29 were installed by SCS in 2006; Borings GS-106 to GS-122 were installed by Geosyntec in 2021-2022.

Table 2-3
Summary of Soil Laboratory Test Results
Plant Wansley CCR Landfill
Carroll and Heard Counties, Georgia

Sample[1]	Sampling Date	Mid Sample Elevation (ft NAVD88)[2]	Type	Depth (ft)	Run (ft)	Recovery (ft)	Recovery (%)	SPT Blow Count	Description	Fines (%)	Gravel (%)	Sand (%)	LL	PI	Engineering Classification (USCS)	In-Situ Density (pcf)	Natural Moisture (%)	Max. Dry Density (pcf)	Optimum Moisture (%)	Gs	Flexible Wall Permeability (cm/sec)	Remolded Density (pcf)	Remolded Moisture (%)	CEC (meq/100g)	K_d (ml/g)	Dry Unit Weight (pcf)	Moisture Content (%)	Plastic Limit	CU Triaxial Cell Pressure, Deviator Stress (psi, psi)	One-Dimensional Consolidation[3]
GS-2	--	--	Bulk	1.0-2.5	--	--	--	--	Light reddish brown sandy lean CLAY	66.5	--	--	47.0	21.0	CL	--	--	96.9	22.7	2.63	3.7×10^{-7}	94.9	24.2	14.8	4380	--	--	--	--	--
GS-2	--	--	Bulk	3.0-4.5	--	--	--	--	Light brown sandy SILT	50.1	--	--	NP	NP	ML	--	--	99.3	18	2.63	3.5×10^{-6}	97.7	19.5	--	--	--	--	--	--	--
GS-4	--	--	UD	3.0-5.0	--	--	--	--	Light reddish brown sandy SILT	57.4	--	--	NP	NP	ML	91.6	15.6	--	--	2.64	1.6×10^{-5}	--	--	--	--	--	--	--	--	--
GS-4	--	--	UD	10.0-12.0	--	--	--	--	Light brown silty SAND	44.2	--	--	NP	NP	SM	91.9	22.7	--	--	2.62	9.9×10^{-5}	--	--	--	--	--	--	--	--	--
GS-7	--	--	Bulk	2.0-3.0	--	--	--	--	--	--	--	--	--	--	--	--	--	104.2	19.8	--	1.4×10^{-6}	100.9	21.3	--	--	--	--	--	--	--
GS-7	--	--	SS	4.5-6.0	--	--	--	--	Reddish brown elastic SILT w/ sand	78.5	--	--	58.0	26.0	MH	--	--	--	--	2.72	--	--	--	--	--	--	--	--	--	--
GS-7	--	--	Bulk	6.0-8.0	--	--	--	--	--	--	--	--	--	--	--	--	--	107.9	17.8	--	4.0×10^{-7}	105.4	19.3	--	--	--	--	--	--	--
GS-7	--	--	SS	14.5-16.0	--	--	--	--	Reddish brown elastic SILT w/ sand	70.3	--	--	53.0	8.0	MH	--	--	--	--	2.73	--	--	--	--	--	--	--	--	--	--
GS-7	--	--	SS	34.5-36.0	--	--	--	--	Light reddish brown sandy SILT	59.6	--	--	NP	NP	ML	--	--	--	--	2.72	--	--	--	--	--	--	--	--	--	--
GS-11	--	--	UD	3.0-5.0	--	--	--	--	Reddish brown elastic SILT w/ sand	73.3	--	--	51.0	17.0	MH	86.1	27.5	--	--	2.69	4.7×10^{-5}	--	--	--	--	--	--	--	--	--
GS-11	--	--	UD	10.0-12.0	--	--	--	--	Light brown sandy SILT	51.3	--	--	NP	NP	ML	95.0	15.4	--	--	2.67	7.3×10^{-5}	--	--	--	--	--	--	--	--	--
GS-13	--	--	Bulk	1.5-3.0	--	--	--	--	Light reddish brown elastic SILT w/ sand	78.5	--	--	50.0	17.0	MH	--	--	90.1	28.3	2.83	1.8×10^{-6}	87.7	29.8	19.7	2345	--	--	--	--	--
GS-13	--	--	Bulk	5.0-6.0	--	--	--	--	Light brown sandy SILT	59.1	--	--	NP	NP	ML	--	--	91.1	24.8	2.83	1.3×10^{-6}	89.7	26.3	18.2	5313	--	--	--	--	--
GS-16	--	--	UD	4.0-6.0	--	--	--	--	Dark brown elastic SILT	86.0	--	--	86.0	31.0	MH	78.6	40.8	--	--	2.83	8.2×10^{-6}	--	--	--	--	--	--	--	--	--
GS-16	--	--	UD	12.0-14.0	--	--	--	--	Light reddish brown sandy SILT	65.7	--	--	NP	NP	ML	87.0	22.1	--	--	2.70	2.3×10^{-4}	--	--	--	--	--	--	--	--	--
GS-17	--	--	SS	4.0-5.5	--	--	--	--	Reddish brown elastic SILT w/ sand	81.6	--	--	55.0	22.0	MH	--	--	--	--	2.74	--	--	--	--	--	--	--	--	--	--
GS-17	--	--	SS	14.5-15.5	--	--	--	--	Light brown sandy SILT	65.3	--	--	NP	NP	ML	--	--	--	--	2.73	--	--	--	--	--	--	--	--	--	--
GS-17	--	--	SS	24.0-25.5	--	--	--	--	Light brown sandy SILT	57.1	--	--	NP	NP	ML	--	--	--	--	2.83	--	--	--	--	--	--	--	--	--	--
GS-19	--	--	Bulk	1.5-3.0	--	--	--	--	Light reddish brown elastic SILT w/ sand	83.7	--	--	54.0	24.0	MH	--	--	98.2	22.5	2.75	2.4×10^{-6}	96.2	24.0	13.8	3030	--	--	--	--	--
GS-19	--	--	Bulk	6.0-7.0	--	--	--	--	Light reddish brown sandy SILT	57.4	--	--	NP	NP	ML	--	--	77.1	34.4	2.84	3.7×10^{-6}	75.6	34.4	27.4	5847	--	--	--	--	--
GS-21	--	--	UD	4.0-6.0	--	--	--	--	Reddish brown silty SAND	43.0	--	--	NP	NP	SM	97.5	11.3	--	--	2.78	6.6×10^{-5}	--	--	--	--	--	--	--	--	--
GS-21	--	--	UD	9.0-11.0	--	--	--	--	Brown silty SAND	46.1	--	--	NP	NP	SM	109.9	13.3	--	--	2.73	1.4×10^{-4}	--	--	--	--	--	--	--	--	--
GS-21	--	--	SS	49.5-51.0	--	--	--	--	Gray silty SAND	38.9	--	--	NP	NP	SM	--	--	--	--	2.75	--	--	--	--	--	--	--	--	--	--
GS-22	--	--	SS	4.5-6.0	--	--	--	--	Light brown SILT w/ sand	79.2	--	--	NP	NP	ML	--	--	--	--	2.69	--	--	--	--	--	--	--	--	--	--
GS-23	--	--	SS	1.0-2.5	--	--	--	--	Reddish brown elastic SILT w/ sand	80.4	--	--	54.0	18.0	MH	--	--	--	--	2.73	--	--	--	--	--	--	--	--	--	--
GS-23	--	--	SS	14.5-16.0	--	--	--	--	Light brown SILT w/ sand	71.0	--	--	NP	NP	ML	--	--	--	--	2.70	--	--	--	--	--	--	--	--	--	--
GS-23	--	--	SS	39.5-41.0	--	--	--	--	Light gray silty SAND	43.1	--	--	NP	NP	SM	--	--	--	--	2.86	--	--	--	--	--	--	--	--	--	--
GS-26	--	--	UD	1.0-3.0	--	--	--	--	Light brown silty SAND	35.4	--	--	NP	NP	SM	102.5	12.2	--	--	2.74	--	--	--	--	--	--	--	--	--	--
GS-26	--	--	UD	10.0-12.0	--	--	--	--	Brown silty SAND	33.6	--	--	NP	NP	SM	109.9	13.2	--	--	2.73	--	--	--	--	--	--	--	--	--	--
GS-28	--	--	UD	4.0-6.0	--	--	--	--	Reddish brown sandy SILT	55.5	--	--	NP	NP	ML	96.9	13.1	--	--	2.78	2.3×10^{-5}	--	--	--	--	--	--	--	--	--
GS-28	--	--	UD	11.0-12.5	--	--	--	--	Lavender sandy SILT	51.4	--	--	NP	NP	ML	100.4	15.5	--	--	2.75	7.1×10^{-5}	--	--	--	--	--	--	--	--	--
GS-29	--	--	Bulk	1.0-2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	100.2	21.8	--	1.7×10^{-7}	98.2	23.3	--	--	--	--	--	--	--
GS-29	--	--	SS	3.0-4.5	--	--	--	--	Reddish brown silty SAND	44.3	--	--	43.0	12.0	SM	--	--	--	--	2.79				--	--	--	--	--	--	--
GS-29	--	--	Bulk	6.0-8.0	--	--	--	--	--	--	--	--	--	--	--	--	--	101.5	20.6	--	5.7×10^{-7}	98.9	22.2	--	--	--	--	--	--	--
GS-29	--	--	SS	13.0-14.5	--	--	--	--	Light brown sandy SILT	55.3	--	--	NP	NP	ML	--	--	--	--	2.77	--	--	--	--	--	--	--	--	--	--
GS-29	--	--	SS	37.0-39.5	--	--	--	--	Light brown sandy SILT	32.0	--	--	NP	NP	SM	--	--	--	--	2.77	--	--	--	--	--	--	--	--	--	--
GS-101 (4-6)	1/21/2022	750.1	SS	4.0-6.0	2.0	1.9	95	10	Sandy SILT	56.1	1.5	42.4	46	14	ML - Sandy silt	--	--	--	--	--	--	--	--	--	--	--	28.3	32	--	--
GS-101 (16-18)	1/21/2022	738.1	SS	16.0-18.0	2.0	1.5	75	23	Silty SAND	24.8	6	69.2	NP	NP	SM-Silty sand	--	--	--	--	--	--	--	--	--	--	--	18.8	NP	--	--
GS-103 (12-14)	2/1/2022	759.1	SS	12.0-14.0	2.0	1.2	60	19	Silty SAND	42	3	55	NP	NP	SM-Silty sand	--	--	--	--	2.77	--	--	--	--	--	--	17.6	NP	--	--
GS-103 (33-35)	2/2/2022	738.1	SS	33.0-35.0	2.0	1.9	95	17	SILT with sand	76.8	0.1	23.1	NP	NP	ML-Silt with sand	--	--	--	--	--	--	--	--	--	--	--	48.4	NP	--	--
GS-104 (6-8)_ST	1/31/2022	721.1	UD	6.0-8.0	2.0	1.5	73	--	Silty SAND	49.2	6.1	44.7	46	10	SM-Silty sand	--	27.8 27.6	--	--	--	--	--	--	--	--	94.1 95.2	--	36	5.6, 15.2 11.2, 23.2	--
GS-104 (24-26)	1/31/2022	703.1	SS	24.0-26.0	2.0	1.8	90	10	Sandy SILT	62	4	34	NP	NP	ML-Silt with sand	--	--	--	--	--	--	--	--	--	--	--	36.7	NP	--	--
GS-105 (4-6)	2/4/2022	728.3	SS	4.0-6.0	2.0	1.5	75	15	Sandy elastic SILT	64	12	24	64	31	MH-Sandy elastic silt	--	--	--	--	--	--	--	--	--	--	--	37.8	33	--	--
GS-106 (20-22)	12/19/2021	750.7	SS	20.0-22.0	2.0	1.5	75	16	--	61	8	31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	28.7	--	--	--
GS-106a (38-40)	2/8/2022	732.5	SS	38.0-40.0	2.0	1.5	75	2	SILT with sand	75.1	--	24.9	NP	NP	ML-Silt with sand	--	--	--	--	--	--	--	--	--	--	--	--	NP	--	--
GS-106a (43-45)	2/8/2022	727.5	SS	43.0-45.0	2.0	2.0	100	2	SILT with sand	79.5	1.9	18.6	48	9	ML-Silt with sand	--	--	--	--	--	--	--	--	--	--	--	58.9	39	--	--
GS-108 (6-8)_ST	2/13/2022	733.8	UD	6.0-8.0	2.0	2.0	100	--	Sandy lean CLAY	69	1	30	28	4	CL-Sandy lean clay	--	28.4 25.1 25.0	--	--	2.69	4.5×10^{-7}	--	--	--	--	96.1 97.4 100.8	24.9	24	--	X
GS-111 (6-8)	1/23/2022	741.7	SS	6.0-8.0	2.0	1.7	95	33	Silty SAND	24.9	3	72.1	NP	NP	SM-Silty sand	--	--	--	--	--	--	--	--	--	--	--	14.3	NP	--	--
GS-112 (23-25)	2/15/2022	725.5	SS	23.0-25.0	2.0	2.0	100	7	SILT with sand	83.2	1.4	15.4	NP	NP	ML-Silt with sand	--	--	--	--	2.77	--	--	--	--	--	--	57	NP	--	--
GS-114 (16-18)	1/4/2022	781.4	SS	16.0-18.0	2.0	1.6	80	10	SILT with sand	80	2	18	48	11	ML-Silt with sand	--		--	--	--	--	--	--	--	--		49.4	37		--
GS-115 (4-6)	1/9/2022	726.2	SS	4.0-6.0	2.0	1.0	50	4	Sandy SILT	58	8	34	31	8	ML-Silt with sand	--	--	--	--	--	--	--	--	--	--	--	31	23	--	--
GS-115 (28-30)	1/9/2022	702.2	SS	28.0-30.0	2.0	1.3	65	>50	--	48.9	5.8	45.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19.1	--	--	--
GS-116 (6-8)_ST	1/5/2022	730.4	UD	6.0-8.0	2.0	1.6	81	--	Elastic SILT with sand	80.5	0.9	18.6	53	18	MH-Elastic silt with sand	--	29.5 28.6 29.8	--	--	--	--	--	--	--	--	94.3 95.1 92.7	29.3	35	2.8, 30.6 5.6, 50.9 11.2, 38.9	--
GS-116 (22-24)_ST	1/5/2022	714.4	UD	22.0-24.0	2.0	2.0	100	--	Sandy SILT	68.2	0.5	31.3	NP	NP	ML-Silt with sand	--	46.3 43.2 56.9	--	--	--	3.8×10^{-5}	--	--	--	--	71.6 78.5 65.6	49	NP	--	X
GS-117 (12-14)	1/6/2022	713.9	SS	12.0-14.0	2.0	1.6	80	13	--	--	--	--	32	3	--	--	--	--	--	--	--	--	--	--	--	--	33.1	29	--	--
GS-117 (16-18)	1/6/2022	709.9	SS	16.0-18.0	2.0	1.8	90	5	--	--	--	--	37	4	--	--	--	--	--	--	--	--	--	--	--	--	51.6	33	--	--
GS-117 (22-24)_ST	1/6/2022	703.9	UD	22.0-24.0	2.0	1.7	85	--	SILT	86.5	0.1	13.4	39	12	Ml-Silt	--	37.6 41.8 38.5	--	--	--	--	--	--	--	--	82.1 77.6 81.1	39.3	27	8.6, 20.8 17.2, 22.5 34.3, 33.5	--
GS-118 (18-20)_ST	2/18/2022	695.0	SS	18.0-20.0	2.0	1.5	75	15	Sandy SILT	68.3	0.7	31	NP	NP	ML-Sandy silt	--	33.5 50.6 54.4	--	--	--	--	--	--	--	--	79.6 68.8 65.4	--	NP	6.7, 16.5 13.4, 18.0 26.8, 23.6	--
GS-119 (8-10)	1/7/2022	702.4	SS	8.0-10.0	2.0	1.6	80	12	Sandy elastic SILT	67.4	2.2	30.4	55	24	MH-Sandy elastic silt	--	--	--	--	--	--	--	--	--	--	--	24.2	31	--	--
GS-119 (14-16)_ST	1/7/2022	696.4	UD	14.0-16.0	2.0	1.9	94	--	Elastic SILT with sand	71.2	--	28.8	50	10	MH-Elastic silt with sand	--	45.9 55.6 52.8	--	--	2.63	--	--	--	--	--	74.5 66.6 68.7	45.4	40	4.6, 15.5 9.2, 18.2 18.4, 22.2	X
GS-119 (20-22)	1/7/2022	690.4	SS	20.0-22.0	2.0	1.9	95	3	Sandy SILT	64	4	32	41	8	ML-Sandy silt	--	--	--	--	--	--	--	--	--	--	--	49.9	33	--	--
GS-120 (6-8)_ST	2/17/2022	702.8	UD	6.0-8.0	2.0	1.4	71	--	SILT with sand	71	2	27	NP	NP	ML-Silt with sand	--	35.3 39.0 44.4	--	--	--	--	--	--	--	--	79.9 75.4 77.1	--	NP	2.8, 15.5 11.2, 24.8	X
GS-121 (12-14)	1/8/2022	681.7	SS	12.0-14.0	2.0	1.8	90	5	Elastic SILT with sand	70.5	--	29.5	51	8	MH-Elastic silt with sand	--	--	--	--	--	--	--	--	--	--	--	58.3	43	--	--
GS-121 (26-28)	1/8/2022	667.7	SS	26.0-28.0	2.0	1.4	70	26	Sandy SILT	65.2	0.2	34.6	36	8	ML-Sandy silt	--	--	--	--	--	--	--	--	--	--	--	29.3	28	--	--
GS-122 (13-15)	2//15/2022	721.3	SS	13.0-15.0	2.0	2.0	100	3	Elastic SILT	95.6	--	4.4	76	12	MH-Elastic silt	--	--	--	--	--	--	--	--	--	--	--	76.8	64	--	--
GS-122 (23-25)	2/15/2022	711.3	SS	23.0-25.0	2.0	1.5	75	2	Elastic SILT	94.4	0.1	5.5	64	3	MH-Elastic silt	--	--	--	--	--	--	--	--	--	--	--	85.6	61	--	--

Notes:

LL - Liquid Limit
PI - Plasticity Index
% Fines - Sieve Analysis
SS - Split Spoon Sample
CEC - Cation Exchange Capacity
SPT - Standard Penetration Test
meq/100g - milliequivalents per 100 grams
psi - pounds per square inch

USCS - Unified Soil Classification System Designation
K_d - Sorption Coefficient
G_s - Specific Gravity
UD - Undisturbed Sample (Shelby Tube)
NP - Non Plastic
pcf - pounds per cubic foot
ml/g - milliliters per gram
cm/sec - centimeters per second

1. Locations GS-1 through GS-29 were drilled by *Southern Company Services* in 2006. Locations GS-101 through GS-122 were drilled by *Thompson Engineering* in 2021 - 2022.
2. Elevations are based on the North American Vertical Datum of 1988 (NAVD88).
3. One-dimensional consolidation testing was performed as indicated. Results are included in Appendix G.

Table 2-4
Seasonal Groundwater Elevations [(1)]
Plant Wansley CCR Landfill
Carroll and Heard Counties, Georgia

Well/Piezometer ID	Easting[2]	Northing[2]	Ground Surface Elevation (NAVD88)[3]	TOC Elevation (NAVD88)[3]	Top of Screen Elevation (NAVD88)[3]	Bottom of Screen Elevation (NAVD88)[3]	Well Depth (ft bgs)	Depth to Water 2/18/2022 (ft BTOC)	Groundwater Elevation 2/18/2022 (NAVD88)[3]	Depth to Water 2/28/2022 (ft BTOC)	Groundwater Elevation 2/28/2022 (NAVD88)[3]	Depth to Water 3/24/2022 (ft BTOC)	Groundwater Elevation 3/24/2022 (NAVD88)[3]	Depth to Water 4/27/2022 (ft BTOC)	Groundwater Elevation 4/27/2022 (NAVD88)[3]	Depth to Water 5/27/2022 (ft BTOC)	Groundwater Elevation 5/27/2022 (NAVD88)[3]	Depth to Water 6/29/2022 (ft BTOC)	Groundwater Elevation 6/29/2022 (NAVD88)[3]	Depth to Water 7/21/2022 (ft BTOC)	Groundwater Elevation 7/21/2022 (NAVD88)[3]
Groundwater Monitoring Wells																					
GWA-1	2027869.53	1236939.14	774.85	778.02	738.45	728.45	49.9	19.77	758.25	19.14	758.88	17.69	760.33	17.35	760.67	18.83	759.19	21.52	756.50	22.58	755.44
GWA-2	2027481.93	1237146.12	812.93	816.16	766.23	756.23	60.1	44.18	771.98	43.56	772.60	42.41	773.75	41.22	774.94	41.39	774.77	42.59	773.57	43.34	772.82
GWA-3	2027159.49	1237239.21	786.82	790.64	769.12	759.12	31.2	24.10	766.54	23.14	767.50	22.47	768.17	21.77	768.87	22.03	768.61	23.02	767.62	24.14	766.50
GWA-4	2026749.02	1237253.83	776.28	779.54	753.28	743.28	40.6	22.13	757.41	21.64	757.90	20.89	758.65	20.04	759.50	20.96	758.58	22.50	757.04	23.34	756.20
GWA-28	2025183.31	1237994.33	849.16	849.16	813.55	803.55	45.8	25.26	823.90	25.00	824.16	24.74	824.42	24.71	824.45	25.06	824.10	25.58	823.58	25.96	823.20
GWA-29	2024982.92	1238288.65	834.67	834.67	787.87	777.87	57.1	32.07	802.60	40.87	793.80	39.71	794.96	42.03	792.64	43.91	790.76	46.25	788.42	46.91	787.76
GWC-5	2026715.50	1237691.33	752.92	755.91	725.22	715.22	40.7	15.30	740.61	14.87	741.04	13.78	742.13	15.05	740.86	16.48	739.43	18.86	737.05	19.35	736.56
GWC-6	2027012.53	1237923.26	746.70	749.98	729.00	719.00	31.1	17.23	732.75	16.74	733.24	16.22	733.76	16.78	733.20	17.64	732.34	18.42	731.56	19.41	730.57
GWC-7	2027271.65	1238264.46	728.07	731.15	715.37	705.37	25.9	7.50	723.65	7.81	723.34	7.51	723.64	7.92	723.23	7.84	723.31	8.19	722.96	8.32	722.83
GWC-8	2027639.15	1238500.90	720.27	723.46	713.57	703.57	20.0	7.69	715.77	8.65	714.81	8.27	715.19	8.72	714.74	8.95	714.51	9.68	713.78	9.86	713.60
GWC-9	2027890.00	1238673.33	709.65	712.65	703.45	693.45	19.4	6.35	706.30	7.13	705.52	6.85	705.80	7.50	705.15	7.33	705.32	8.11	704.54	8.11	704.54
GWC-10	2028307.55	1238950.91	705.87	709.41	697.77	687.77	22.0	10.41	699.00	11.36	698.05	10.68	698.73	11.72	697.69	11.34	698.07	11.97	697.44	11.76	697.65
GWC-11	2028591.50	1238931.30	697.73	701.05	693.03	683.03	18.2	4.54	696.51	6.00	695.05	5.39	695.66	6.42	694.63	6.51	694.54	6.96	694.09	7.09	693.96
GWC-12	2028921.26	1238739.91	721.09	724.06	693.89	683.89	40.6	27.03	697.03	27.16	696.90	26.78	697.28	26.76	697.30	26.79	697.27	27.03	697.03	26.96	697.10
GWC-13	2029289.12	1238623.75	690.83	694.08	616.13	606.13	90.4	5.48	688.60	5.77	688.31	5.38	688.70	6.07	688.01	5.79	688.29	6.23	687.85	6.66	687.42
GWC-14	2029551.62	1238429.70	688.56	692.63	678.56	668.56	24.6	8.70	683.93	9.40	683.23	8.99	683.64	9.70	682.93	9.61	683.02	9.94	682.69	9.79	682.84
GWC-15	2029813.01	1238164.60	684.51	687.44	646.81	636.81	51.1	5.21	682.23	5.86	681.58	5.32	682.12	6.42	681.02	6.84	680.60	7.10	680.34	6.89	680.55
GWC-16	2029989.93	1237810.54	686.85	690.32	673.45	663.45	27.0	9.37	680.95	9.68	680.64	9.28	681.04	10.51	679.81	10.44	679.88	11.13	679.19	11.17	679.15
GWC-17	2029802.78	1237469.44	701.30	704.55	661.30	651.30	53.3	19.91	684.64	19.50	685.05	9.26	695.29[4]	19.80	684.75	20.50	684.05	21.40	683.15	21.33	683.22
GWC-18	2029693.01	1237098.47	697.19	700.31	679.99	669.99	30.5	12.15	688.16	12.46	687.85	12.11	688.20	13.29	687.02	13.87	686.44	15.45	684.86	15.07	685.24
GWC-19	2029324.62	1236842.26	696.80	698.47	672.60	662.60	38.6	3.33	695.14	6.48	691.99	6.01	692.46	7.75	690.72	8.41	690.06	10.20	688.27	7.45	691.02
GWC-20	2029150.85	1236646.16	702.55	706.29	644.85	634.85	71.1	5.37	700.92	4.88	701.41	4.53	701.76	5.11	701.18	5.32	700.97	6.68	699.61	7.31	698.98
GWC-21	2028635.02	1236231.35	717.37	721.02	693.07	683.07	38.3	13.00	708.02	12.56	708.46	11.11	709.91	12.32	708.70	14.07	706.95	16.41	704.61	16.87	704.15
GWC-22	2028325.82	1236394.61	740.99	744.17	677.29	667.29	77.2	23.38	720.79	22.88	721.29	21.78	722.39	22.42	721.75	22.34	721.83	23.97	720.20	24.81	719.36
GWC-23	2028089.68	1236656.21	770.42	773.41	715.72	705.72	68.1	35.26	738.15	35.06	738.35	34.14	739.27	33.69	739.72	34.24	739.17	35.46	737.95	35.90	737.51
GWC-24	2026408.82	1237354.39	787.13	790.37	749.23	739.23	51.1	41.59	748.78	41.71	748.66	39.57	750.80	38.55	751.82	39.38	750.99	41.00	749.37	42.39	747.98
GWC-25	2026090.24	1237403.28	809.18	812.36	761.18	751.18	61.2	51.17	761.19	50.82	761.54	50.44	761.92	49.79	762.57	49.22	763.14	49.66	762.70	50.23	762.13
GWC-26	2025790.83	1237623.47	782.49	785.60	736.29	726.29	59.4	30.48	755.12	24.06	761.54	29.31	756.29	27.82	757.78	28.07	757.53	29.18	756.42	29.97	755.63
GWC-27	2025523.43	1237827.75	811.24	814.32	753.54	743.54	70.8	44.21	770.11	43.19	771.13	41.54	772.78	41.05	773.27	42.09	772.23	43.60	770.72	44.75	769.57
GWC-30	2025117.63	1238566.16	788.45	791.10	751.75	741.75	49.6	25.55	765.55	24.98	766.12	23.93	767.17	24.24	766.86	25.67	765.43	27.00	764.10	27.86	763.24
GWC-31	2025617.59	1238700.61	793.62	797.50	770.02	760.02	38.0	29.78	767.72	29.50	768.00	28.76	768.74	28.84	768.66	30.04	767.46	31.50	766.00	33.52	763.98
GWC-32	2025875.03	1238775.08	782.17	785.38	764.47	754.47	31.1	25.06	760.32	24.78	760.60	24.34	761.04	24.77	760.61	24.69	760.69	25.60	759.78	25.87	759.51
GWC-33	2026322.02	1238819.20	757.04	760.05	746.34	736.34	24.0	13.37	746.68	13.27	746.78	13.29	746.76	13.55	746.50	13.57	746.48	13.80	746.25	13.79	746.26
GWC-34	2026570.30	1238558.91	731.84	735.40	694.64	684.64	51.3	4.11	731.29	3.97	731.43	3.71	731.69	4.49	730.91	4.17	731.23	4.73	730.67	4.92	730.48
GWC-35	2026822.30	1238244.59	728.11	730.64	700.41	690.41	40.8	7.46	723.18	7.80	722.84	7.68	722.96	7.77	722.87	7.92	722.72	8.23	722.41	7.87	722.77
Water Level Piezometers																					
GS-101	2026776.34	1239073.05	755.12	757.29	715.12	705.12	50.3	19.28	738.01	19.28	738.01	18.61	738.68	18.66	738.63	19.46	737.83	20.53	736.76	20.78	736.51
GS-102	2026891.14	1238540.08	761.68	764.85	727.68	717.68	44.3	28.27	736.58	28.09	736.76	27.62	737.23	27.14	737.71	28.41	736.44	29.24	735.61	29.91	734.94
GS-103	2027276.15	1239177.40	772.08	773.90	725.08	715.08	57.3	36.84	737.06	36.56	737.34	35.66	738.24	36.15	737.75	36.96	736.94	37.86	736.04	38.36	735.54
GS-104	2027282.36	1238728.13	728.10	732.50	708.10	698.10	30.3	9.31	723.19	8.51	723.99	7.86	724.64	9.73	722.77	11.89	720.61	13.05	719.45	12.92	719.58
GS-105	2027727.21	1238911.67	733.34	735.60	725.34	715.34	18.3	18.13	717.47	18.90	716.70	18.44	717.16	19.11	716.49	19.47	716.13	19.99	715.61	19.97	715.63

Notes:
ID = Identification
TOC = Top of Casing
ft bgs = Feet below ground surface
ft BTOC = Feet below top of casing
1. Table only includes wells and piezometers at or within the immediate vicinity of the CCR Landfill site.
2. Northings and Eastings are based on the North American Datum of 1983 (NAD83) Georgia State Plane, West zone, US Survey Foot
3. Elevations provided are based on the North American Vertical Datum of 1988 (NAVD88).
4. Measurement may be anomalous due to recording error in the field.

Table 2-4
Seasonal Groundwater Elevations [(1)]
Plant Wansley CCR Landfill
Carroll and Heard Counties, Georgia

Well/Piezometer ID	Easting[2]	Northing[2]	Ground Surface Elevation (NAVD88)[3]	TOC Elevation (NAVD88)[3]	Top of Screen Elevation (NAVD88)[3]	Bottom of Screen Elevation (NAVD88)[3]	Well Depth (ft bgs)	Depth to Water 8/26/2022 (ft BTOC)	Groundwater Elevation 8/26/2022 (NAVD88)[3]	Depth to Water 9/28/2022 (ft BTOC)	Groundwater Elevation 9/28/2022 (NAVD88)[3]	Depth to Water 10/27/2022 (ft BTOC)	Groundwater Elevation 10/27/2022 (NAVD88)[3]	Depth to Water 11/28/2022 (ft BTOC)	Groundwater Elevation 11/28/2022 (NAVD88)[3]	Depth to Water 12/28/2022 (ft BTOC)	Groundwater Elevation 12/28/2022 (NAVD88)[3]	Depth to Water 1/23/2023 (ft BTOC)	Groundwater Elevation 1/23/2023 (NAVD88)[3]
Groundwater Monitoring Wells																			
GWA-1	2027869.53	1236939.14	774.85	778.02	738.45	728.45	49.9	23.99	754.03	24.57	753.45	24.50	753.52	26.13	751.89	24.86	753.16	22.49	755.53
GWA-2	2027481.93	1237146.12	812.93	816.16	766.23	756.23	60.1	44.26	771.90	44.91	771.25	45.77	770.39	46.51	769.65	46.00	770.16	45.32	770.84
GWA-3	2027159.49	1237239.21	786.82	790.64	769.12	759.12	31.2	24.78	765.86	25.22	765.42	26.38	764.26	28.17	762.47	29.01	761.63	29.15	761.49
GWA-4	2026749.02	1237253.83	776.28	779.54	753.28	743.28	40.6	24.22	755.32	24.50	755.04	25.05	754.49	25.47	754.07	24.86	754.68	24.12	755.42
GWA-28	2025183.31	1237994.33	849.16	849.16	813.55	803.55	45.8	26.46	822.70	23.49	825.67	26.77	822.39	27.41	821.75	26.59	822.57	25.73	823.43
GWA-29	2024982.92	1238288.65	834.67	834.67	787.87	777.87	57.1	46.72	787.95	44.53	790.14	48.93	785.74	46.24	788.43	42.64	792.03	40.25	794.42
GWC-5	2026715.50	1237691.33	752.92	755.91	725.22	715.22	40.7	19.32	736.59	19.27	736.64	20.24	735.67	20.42	735.49	17.91	738.00	15.18	740.73
GWC-6	2027012.53	1237923.26	746.70	749.98	729.00	719.00	31.1	19.42	730.56	19.13	730.85	19.71	730.27	19.53	730.45	18.24	731.74	16.98	733.00
GWC-7	2027271.65	1238264.46	728.07	731.15	715.37	705.37	25.9	8.26	722.89	8.58	722.57	8.50	722.65	8.07	723.08	7.95	723.20	7.26	723.89
GWC-8	2027639.15	1238500.90	720.27	723.46	713.57	703.57	20.0	9.63	713.83	9.75	713.71	10.00	713.46	9.14	714.32	9.27	714.19	7.86	715.60
GWC-9	2027890.00	1238673.33	709.65	712.65	703.45	693.45	19.4	7.84	704.81	8.02	704.63	7.81	704.84	7.28	705.37	7.36	705.29	6.25	706.40
GWC-10	2028307.55	1238950.91	705.87	709.41	697.77	687.77	22.0	11.63	697.78	12.03	697.38	12.19	697.22	11.36	698.05	11.73	697.68	10.18	699.23
GWC-11	2028591.50	1238931.30	697.73	701.05	693.03	683.03	18.2	6.99	694.06	7.28	693.77	7.14	693.91	6.62	694.43	6.63	694.42	4.96	696.09
GWC-12	2028921.26	1238739.91	721.09	724.06	693.89	683.89	40.6	26.74	697.32	26.88	697.18	27.03	697.03	27.03	697.03	26.88	697.18	26.96	697.10
GWC-13	2029289.12	1238623.75	690.83	694.08	616.13	606.13	90.4	6.47	687.61	7.08	687.00	6.81	687.27	6.28	687.80	6.52	687.56	5.57	688.51
GWC-14	2029551.62	1238429.70	688.56	692.63	678.56	668.56	24.6	9.64	682.99	9.99	682.64	9.85	682.78	9.46	683.17	9.63	683.00	8.41	684.22
GWC-15	2029813.01	1238164.60	684.51	687.44	646.81	636.81	51.1	6.94	680.50	7.02	680.42	7.08	680.36	6.84	680.60	6.38	681.06	4.90	682.54
GWC-16	2029989.93	1237810.54	686.85	690.32	673.45	663.45	27.0	10.96	679.36	11.63	678.69	11.49	678.83	10.41	679.91	10.25	680.07	9.23	681.09
GWC-17	2029802.78	1237469.44	701.30	704.55	661.30	651.30	53.3	21.37	683.18	21.50	683.05	21.81	682.74	21.14	683.41	20.25	684.30	19.77	684.78
GWC-18	2029693.01	1237098.47	697.19	700.31	679.99	669.99	30.5	14.58	685.73	15.19	685.12	15.53	684.78	14.28	686.03	13.15	687.16	11.75	688.56
GWC-19	2029324.62	1236842.26	696.80	698.47	672.60	662.60	38.6	6.60	691.87	7.35	691.12	7.83	690.64	6.32	692.15	5.02	693.45	3.09	695.38
GWC-20	2029150.85	1236646.16	702.55	706.29	644.85	634.85	71.1	7.02	699.27	7.73	698.56	8.39	697.90	7.64	698.65	6.62	699.67	5.26	701.03
GWC-21	2028635.02	1236231.35	717.37	721.02	693.07	683.07	38.3	16.59	704.43	17.47	703.55	18.11	702.91	16.80	704.22	16.16	704.86	12.95	708.07
GWC-22	2028325.82	1236394.61	740.99	744.17	677.29	667.29	77.2	25.91	718.26	26.53	717.64	27.09	717.08	27.55	716.62	27.10	717.07	25.78	718.39
GWC-23	2028089.68	1236656.21	770.42	773.41	715.72	705.72	68.1	36.78	736.63	37.37	736.04	37.94	735.47	38.38	735.03	38.00	735.41	36.64	736.77
GWC-24	2026408.82	1237354.39	787.13	790.37	749.23	739.23	51.1	44.54	745.83	45.25	745.12	45.32	745.05	Dry	Dry	Dry	Dry	Dry	Dry
GWC-25	2026090.24	1237403.28	809.18	812.36	761.18	751.18	61.2	50.80	761.56	50.23	762.13	51.41	760.95	51.70	760.66	51.87	760.49	51.84	760.52
GWC-26	2025790.83	1237623.47	782.49	785.60	736.29	726.29	59.4	30.86	754.74	31.43	754.17	31.91	753.69	32.51	753.09	32.63	752.97	32.61	752.99
GWC-27	2025523.43	1237827.75	811.24	814.32	753.54	743.54	70.8	45.04	769.28	45.33	768.99	46.49	767.83	47.22	767.10	45.92	768.40	45.16	769.16
GWC-30	2025117.63	1238566.16	788.45	791.10	751.75	741.75	49.6	28.61	762.49	28.81	762.29	29.12	761.98	29.37	761.73	28.24	762.86	26.95	764.15
GWC-31	2025617.59	1238700.61	793.62	797.50	770.02	760.02	38.0	36.43	761.07	35.48	762.02	35.46	762.04	35.83	761.67	35.58	761.92	29.27	768.23
GWC-32	2025875.03	1238775.08	782.17	785.38	764.47	754.47	31.1	27.88	757.50	25.72	759.66	26.20	759.18	26.23	759.15	25.79	759.59	25.19	760.19
GWC-33	2026322.02	1238819.20	757.04	760.05	746.34	736.34	24.0	13.64	746.41	13.67	746.38	13.87	746.18	13.69	746.36	13.54	746.51	13.27	746.78
GWC-34	2026570.30	1238558.91	731.84	735.40	694.64	684.64	51.3	4.85	730.55	5.11	730.29	4.77	730.63	4.38	731.02	4.42	730.98	3.93	731.47
GWC-35	2026822.30	1238244.59	728.11	730.64	700.41	690.41	40.8	7.69	722.95	7.66	722.98	7.55	723.09	7.42	723.22	7.14	723.50	6.89	723.75
Water Level Piezometers																			
GS-101	2026776.34	1239073.05	755.12	757.29	715.12	705.12	50.3	19.82	737.47	21.00	736.29	21.12	736.17	20.86	736.43	20.23	737.06	19.44	737.85
GS-102	2026891.14	1238540.08	761.68	764.85	727.68	717.68	44.3	30.59	734.26	30.68	734.17	31.23	733.62	31.70	733.15	30.06	734.79	28.67	736.18
GS-103	2027276.15	1239177.40	772.08	773.90	725.08	715.08	57.3	38.81	735.09	38.97	734.93	39.31	734.59	39.48	734.42	38.56	735.34	35.83	738.07
GS-104	2027282.36	1238728.13	728.10	732.50	708.10	698.10	30.3	12.45	720.05	12.21	720.29	13.11	719.39	12.34	720.16	10.16	722.34	8.46	724.04
GS-105	2027727.21	1238911.67	733.34	735.60	725.34	715.34	18.3	20.00	715.60	19.96	715.64	20.07	715.53	19.93	715.67	19.46	716.14	17.86	717.74

Notes:
ID = Identification
TOC = Top of Casing
ft bgs = Feet below ground surface
ft BTOC = Feet below top of casing
1. Table only includes wells and piezometers at or within the immediate vicinity of the CCR Landfill site.
2. Northings and Eastings are based on the North American Datum of 1983 (NAD83) Georgia State Plane, West zone, US Survey Foot
3. Elevations provided are based on the North American Vertical Datum of 1988 (NAVD88).
4. Measurement may be anomalous due to recording error in the field.

Table 3-1
Summary of Horizontal Hydraulic Conductivity Results
Plant Wansley CCR Landfill
Carroll and Heard Counties, Georgia

Piezometer ID [1,2]	Screened Lithology	Saturated Thickness of Aquifer (feet)	Screen Length (feet)	Piezometer Diameter (inches)	Aquifer Test Type	Analysis Method	Horizontal Hydraulic Conductivity (cm/sec)	Horizontal Hydraulic Conductivity (ft/day)	Horizontal Hydraulic Conductivity by Lithological Unit (ft/day)		
									Max	Min	Geometric Mean
GS-3	Regolith	23	9	2	Falling (Slug in)	Bouwer-Rice	1.68E-04	0.48	3.14	0.18	0.63
					Rising (Slug out)	Bouwer-Rice	1.88E-04	0.53			
GS-21		40	9	2	Falling (Slug in)	Bouwer-Rice	1.11E-03	3.14			
					Rising (Slug out)	Bouwer-Rice	8.41E-04	2.39			
GS-27		100	9.5	2	Falling (Slug in)	Bouwer-Rice	3.25E-04	0.92			
					Rising (Slug out)	Bouwer-Rice	3.25E-04	0.92			
GS-29		100	10	1	Falling (Slug in)	Bouwer-Rice	1.59E-04	0.45			
					Rising (Slug out)	Bouwer-Rice	1.61E-04	0.46			
GS-101		33	10	2	Pneumatic Slug Test 1	Bouwer-Rice	3.63E-04	1.03			
					Pneumatic Slug Test 2	Bouwer-Rice	3.30E-04	0.94			
GS-103		21	10	1	Pneumatic Slug Test 1	Bouwer-Rice	6.67E-05	0.19			
					Pneumatic Slug Test 2	Bouwer-Rice	6.18E-05	0.18			
GS-104		23	10	1	Pneumatic Slug Test 1	Bouwer-Rice	1.34E-04	0.38			
					Pneumatic Slug Test 2	Bouwer-Rice	1.45E-04	0.41			
GS-102	Regolith/Bedrock	19	10	2	Pneumatic Slug Test 1	Bouwer-Rice	7.82E-05	0.22	0.35	0.22	0.28
					Pneumatic Slug Test 2	Bouwer-Rice	9.74E-05	0.28			
GS-105		5	10	2	Water Slug In Test 1	Bouwer-Rice	1.03E-04	0.29			
					Water Slug In Test 2	Bouwer-Rice	1.24E-04	0.35			
GS-4	Bedrock	12	9	2	Falling (Slug in)	Bouwer-Rice	3.62E-02	102.64	102.64	0.50	3.39
					Rising (Slug out)	Bouwer-Rice	2.06E-02	58.31			
GS-18		3	3.1	2	Falling (Slug in)	Bouwer-Rice	2.67E-04	0.76			
					Rising (Slug out)	Bouwer-Rice	3.38E-04	0.96			
GS-25		100	10	1	Falling (Slug in)	Bouwer-Rice	2.45E-04	0.70			
					Rising (Slug out)	Bouwer-Rice	1.76E-04	0.50			
								Regolith, Regolith/Bedrock, Bedrock combined	**102.64**	**0.18**	**0.84**

Notes:
1. GS-3, GS-4, GS-18, GS-21, GS-25, GS-27, and GS-29 were slug tested by Southern Company Services in November 2006.
2. GS-101, GS-102, GS-103, GS-104, and GS-105 were slug tested by Geosyntec Consultants in February 2022.

Table 3-2
LeGrand Analysis
Input Parameters and Results
Plant Wansley CCR Landfill
Carroll and Heard Counties, Georgia

Criteria	**Input Value or Type for Natural Site**	**LeGrand Score for Natural Site**	**LeGrand Score for Lined Site**
Water table depth below waste material (WT)	5.0 ft	0.3	0.3
Sorption (S)	Equal Amounts of Clay and Sand	3.0	4.0
Permeability (P)	Silty sand	2.5	3.0
Gradient (G)	Average gradient is 4%	4.1	4.6
Distance to potential receptor (D)	700 feet	4.5	4.5
Thickness of porous media below waste material (T)	Average 56 feet	2.0	2.8
Total		16.4	19.2
Rating		**Possible, but not likely**	**Possible, but not likely**

Notes:
1. The LeGrand (1964) rating chart for two-media sites was used for scoring.
2. "Possible, but not likely" indicates that the potential for pollution is possible, but it is not likely to occur.
3. Total Points and Pollution Potential for Site (taken from GA EPD Circular 14):
   0 - 4 = Imminent
   4 - 8 = Probable
   8 - 12 = Possible
   12 - 25 = Possible, but not likely
   25+ = Approaching Impossible

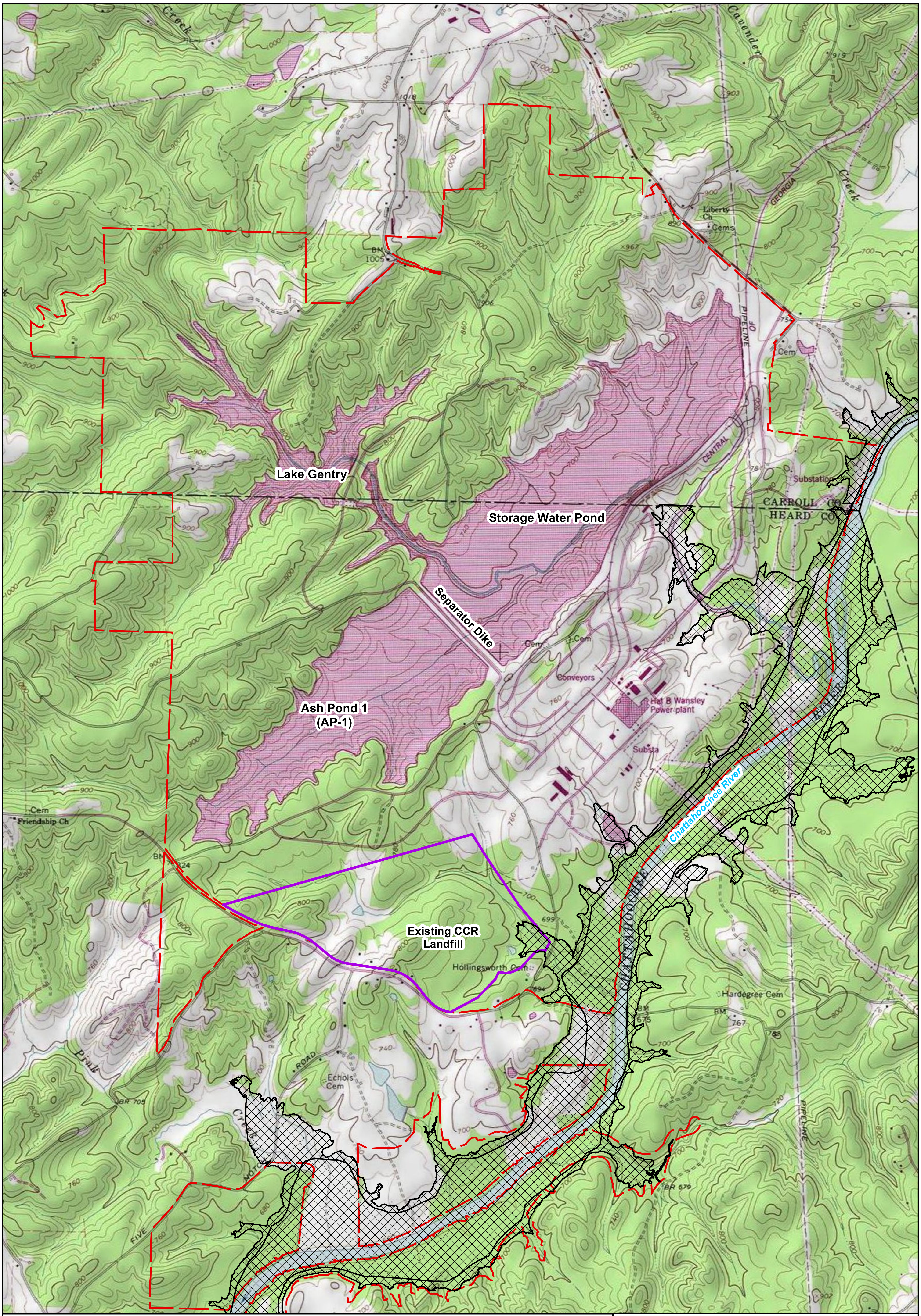
Table 3-3
Estimated Leachate Travel Time
Plant Wansley CCR Landfill
Carroll and Heard Counties, Georgia

	Horizontal Hydraulic Conductivity[1] K (ft/day)	Gradient[2] (ft/ft)	Effective Porosity[3]	Distance to Receptor[4] (ft)	Groundwater Flow Velocity (ft/day)	Estimated Travel Time (years)
Typical Conditions	0.84	0.038	0.15	700	0.21	9
Worst Case Conditions	3.14	0.048	0.15	700	1.00	2

Notes:

1. Hydraulic conductivity values are geometric mean from Southern Company Services and Geosyntec tests in regolith, regolith/PWR, and PWR/bedrock piezometers.
2. Hydraulic gradient from potentiometric surface map developed by Geosyntec Consultants (2022).
3. Effective porosity based on Maidment (1993).
4. The distance to nearest potential receptor is based on distance to a potential private well to the south (NewFields 2020).

FIGURES



Legend

Property Boundary

Existing Landfill Permit Boundary

100 Year Floodplain

N

0 500 1,000 2,000
Feet

Topographic map from USGS Lowell, Georgia Quadrangle, 7.5 minute series (1982).

Regional Topography and Site Location
Plant Wansley

Georgia Power Company
1371 Liberty Church Rd.
Carroll County, GA

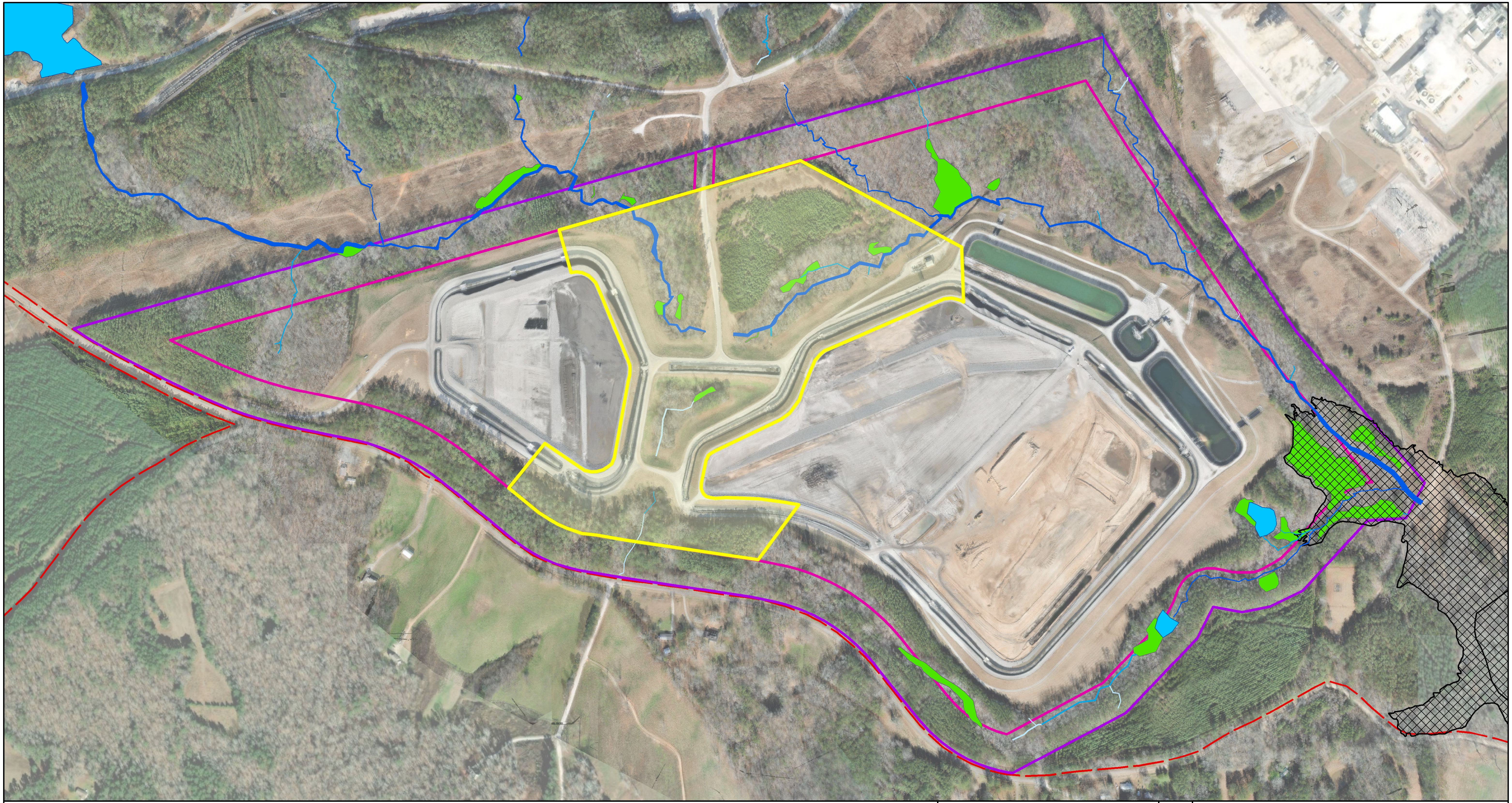
Geosyntec
consultants

Figure

1-1

Kennesaw, GA	January 2024

N:\GA Power\Plant Wansley\GIS\MXD\Landfill Expansion\SAR Figure XX Site and Topographic Map.mxd 1/2/2024 9:15:38 AM

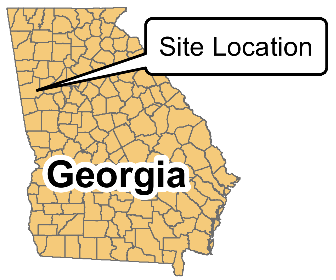


Legend

- Approx. Limit of Proposed Cell 4 Development
- 200-Foot Undisturbed Buffer
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- Wetland
- Open Water
- Existing Landfill Permit Boundary
- Property Boundary
- 100 Year Floodplain

Notes:
Stream and wetland data provided by Ecological Solutions, Inc.

0 300 600 1,200 Feet



N

Proximity to Streams and Wetlands

Georgia Power Company
1371 Liberty Church Road
Carrollton, Ga 30116

Prepared For: Georgia Power

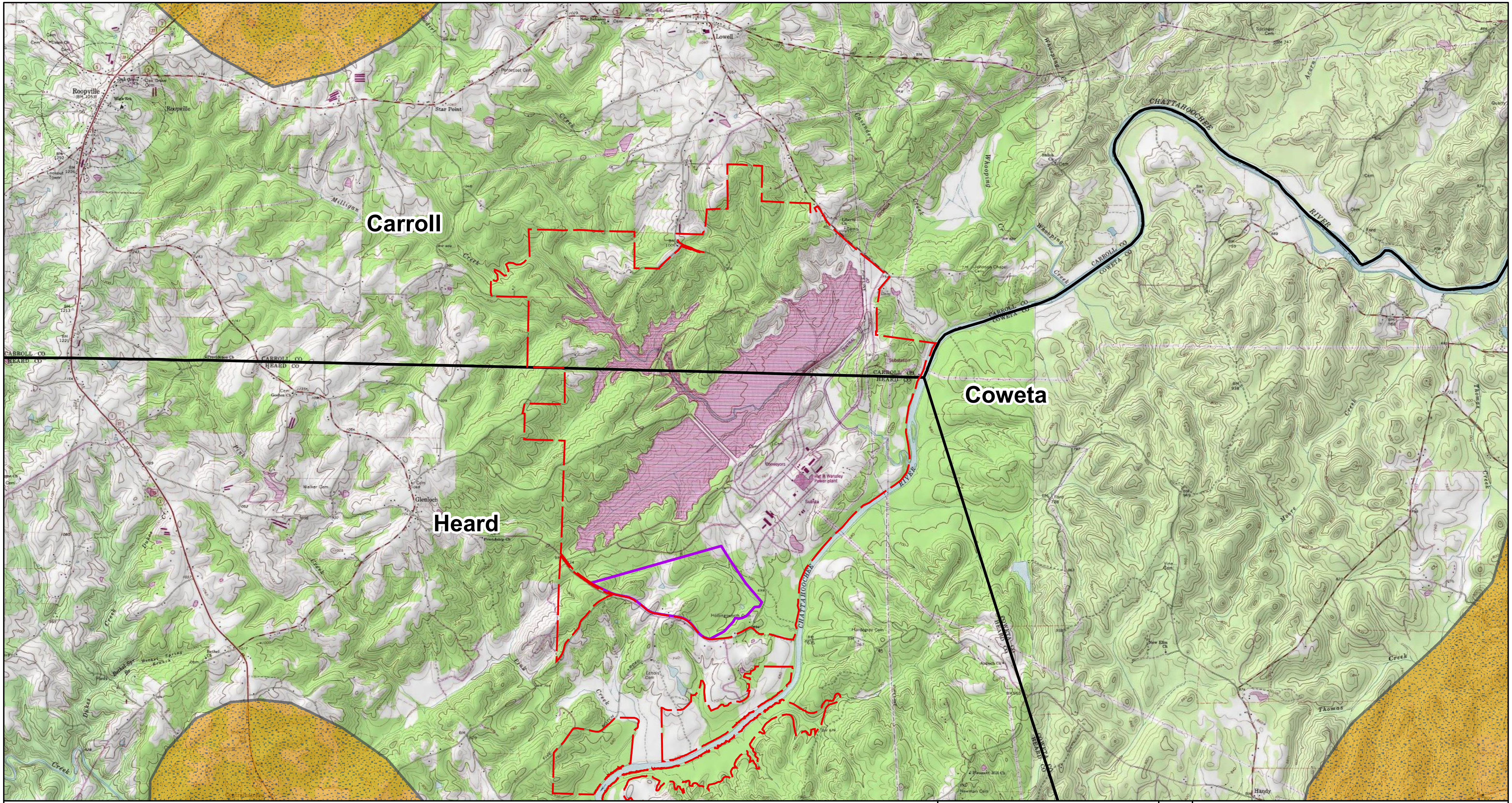
Prepared By: Geosyntec consultants

Kennesaw, Ga | January 2024

Figure

1-2

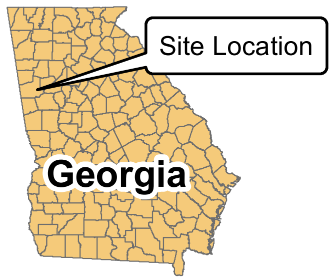
N:\GA Power\Plant Wansley\GIS\MXD\Landfill Expansion\SAR Figure 1-3 Proximity to Streams and Wetlands.mxd 1/2/2024 9:20:23 AM



Legend

- Property Boundary
- Existing Landfill Permit Boundary
- County
- Probable Areas of Thick Soils (may be Significant Recharge Area)

0 3,000 6,000 12,000 Feet



N

Proximity to County Lines and Significant Groundwater Recharge Areas
Georgia Power Company
1371 Liberty Church Road
Carrolton, Ga 30116

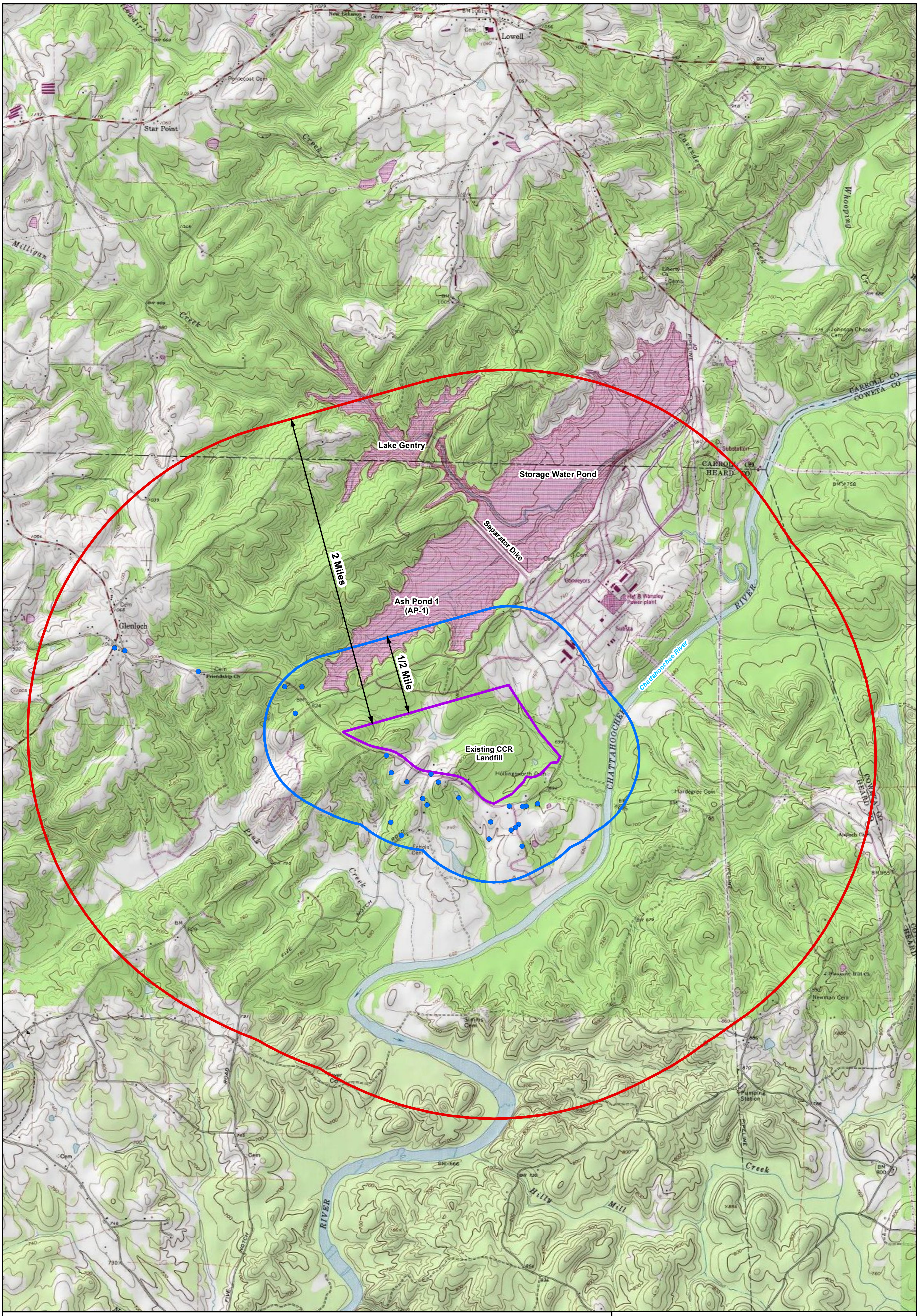
Prepared For: Georgia Power

Prepared By: Geosyntec consultants

Kennesaw, Ga | January 2024

Figure 1-3

N:\GA Power\Plant Wansley\GIS\MXD\Landfill Expansion\SAR Figure XX County Boundary.mxd 1/2/2024 9:24:31 AM



Legend

- Private Water Well
- Half Mile Buffer from CCR Permit Site Boundary
- Two Mile Buffer from CCR Permit Site Boundary
- Property Boundary
- Existing Landfill Permit Boundary

N

0 1,500 3,000 6,000 Feet

Topographic map from USGS Lowell, Georgia Quadrangle, 7.5 minute series (1982).

Private Water Wells Within 1/2 mile of Site Boundary - Plant Wansley

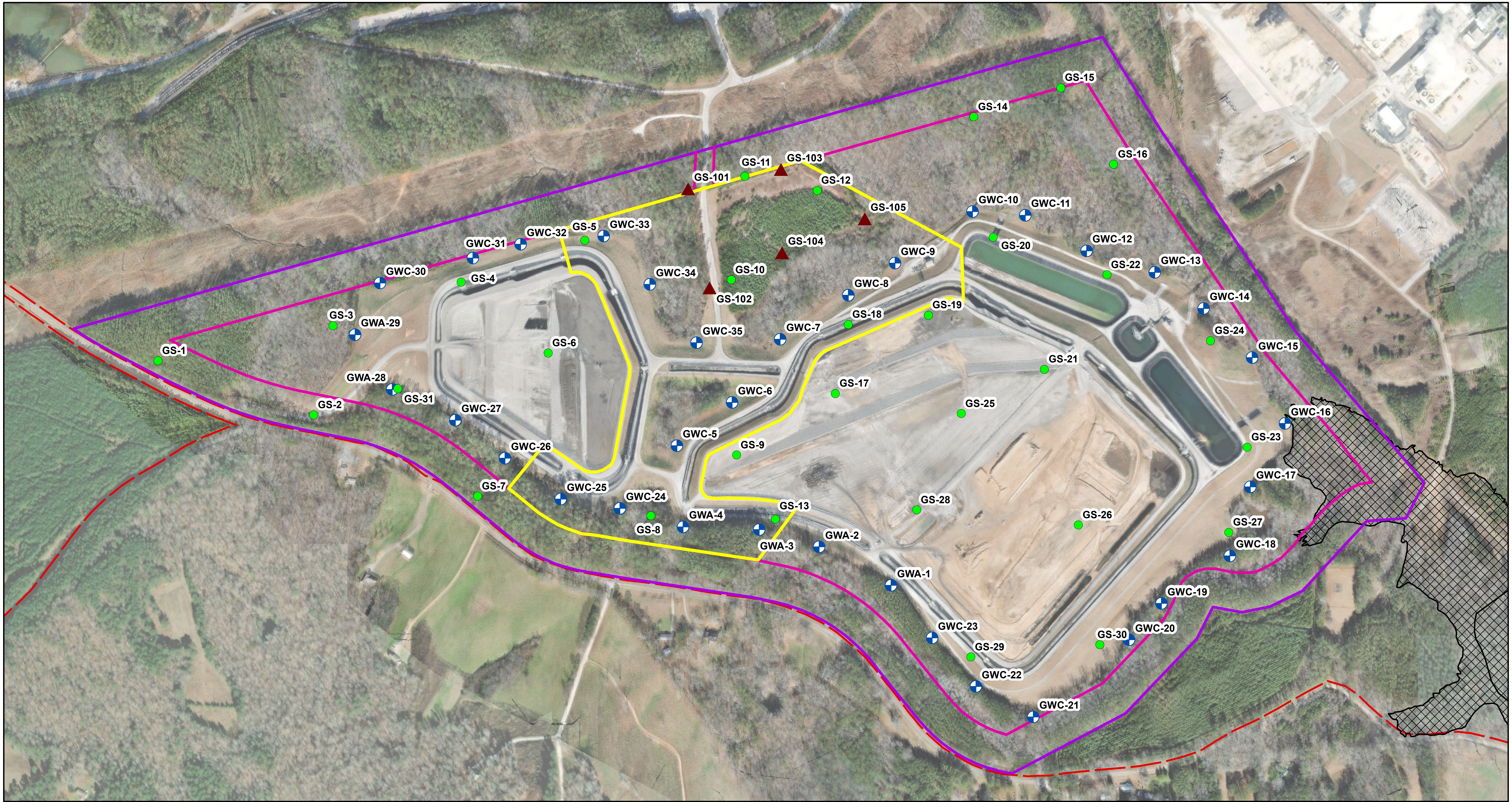
Georgia Power Company
1371 Liberty Church Rd.
Carroll County, GA

Geosyntec consultants

Kennesaw, GA | January 2024

Figure 1-4

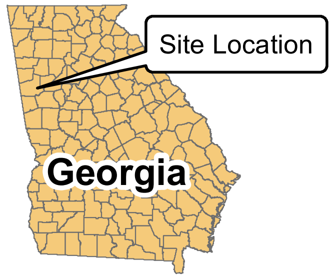
N:\GA Power\Plant Wansley\GIS\MXD\Landfill Expansion\Figure XX Residential Well Survey_v2.mxd 1/2/2024 9:30:10 AM



Legend

- Historical Boring/Piezometer (2006)
- Existing Landfill Monitoring Well (2011)
- Temporary Piezometer (2022)
- 200-foot Undisturbed Buffer
- Existing Landfill Permit Boundary
- Approx. Limit of Proposed Cell 4 Development
- Property Boundary
- 100 Year Floodplain

0 300 600 1,200 Feet



N

Piezometer and Well Locations

Georgia Power Company
1371 Liberty Church Road
Carrolton, Ga 30116

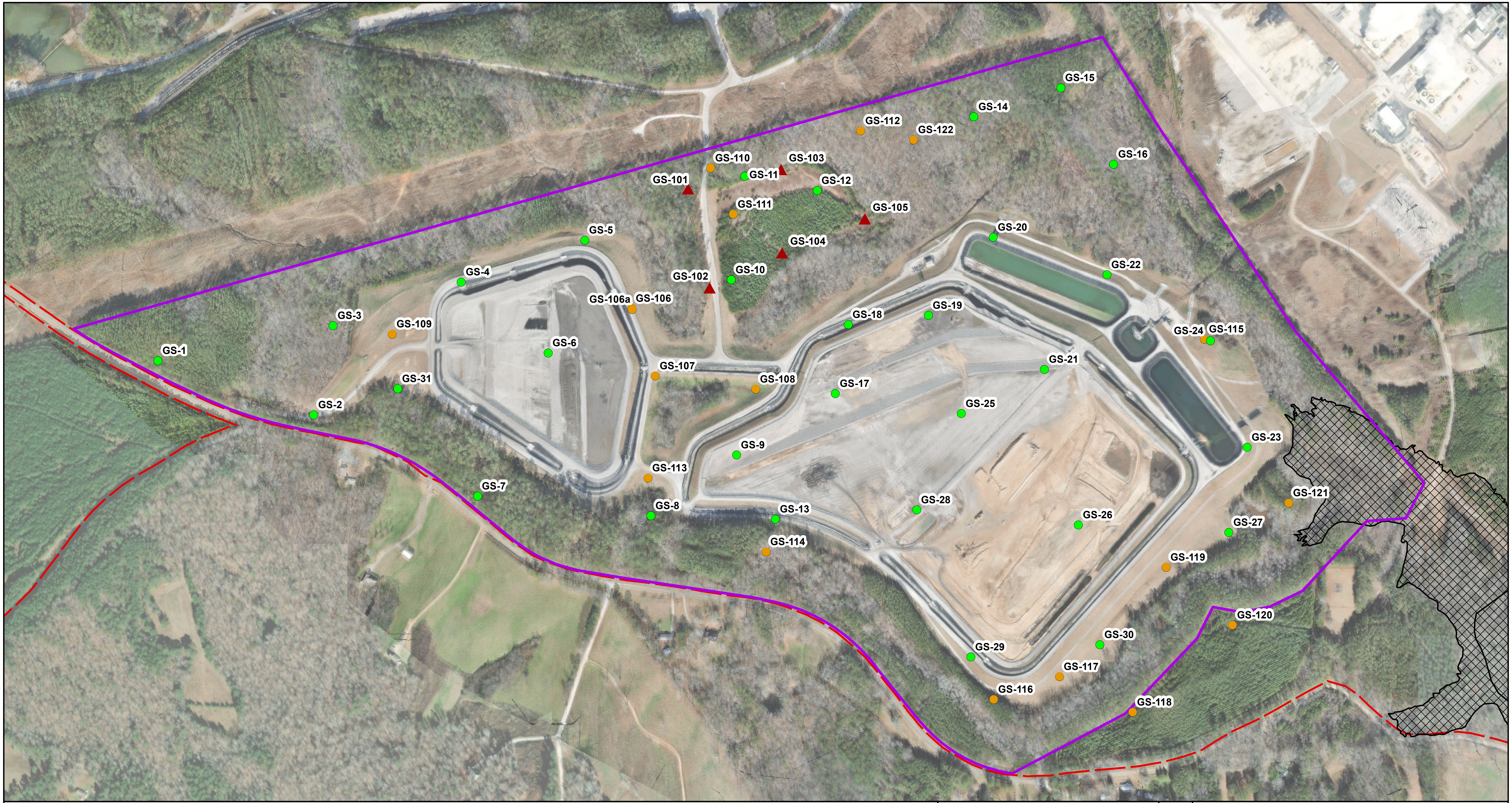
Prepared For: Georgia Power

Prepared By: Geosyntec consultants

Kennesaw, Ga | January 2024

Figure 2-1

N:\GA Power\Plant Wansley\GIS\MXD\Landfill Expansion\SAR Figure 2-1 PZ and Well Locations.mxd 1/2/2024 10:23:29 AM



Legend

- Historical Boring/Piezometer (2006)
- Geotechnical Boring (2022)
- Temporary Piezometer (2022)
- Existing Landfill Permit Boundary
- Property Boundary
- 100 Year Floodplain

0 300 600 1,200 Feet

Site Location

Georgia

N

Geotechnical Boring Locations

Georgia Power Company
1371 Liberty Church Road
Carrolton, Ga 30116

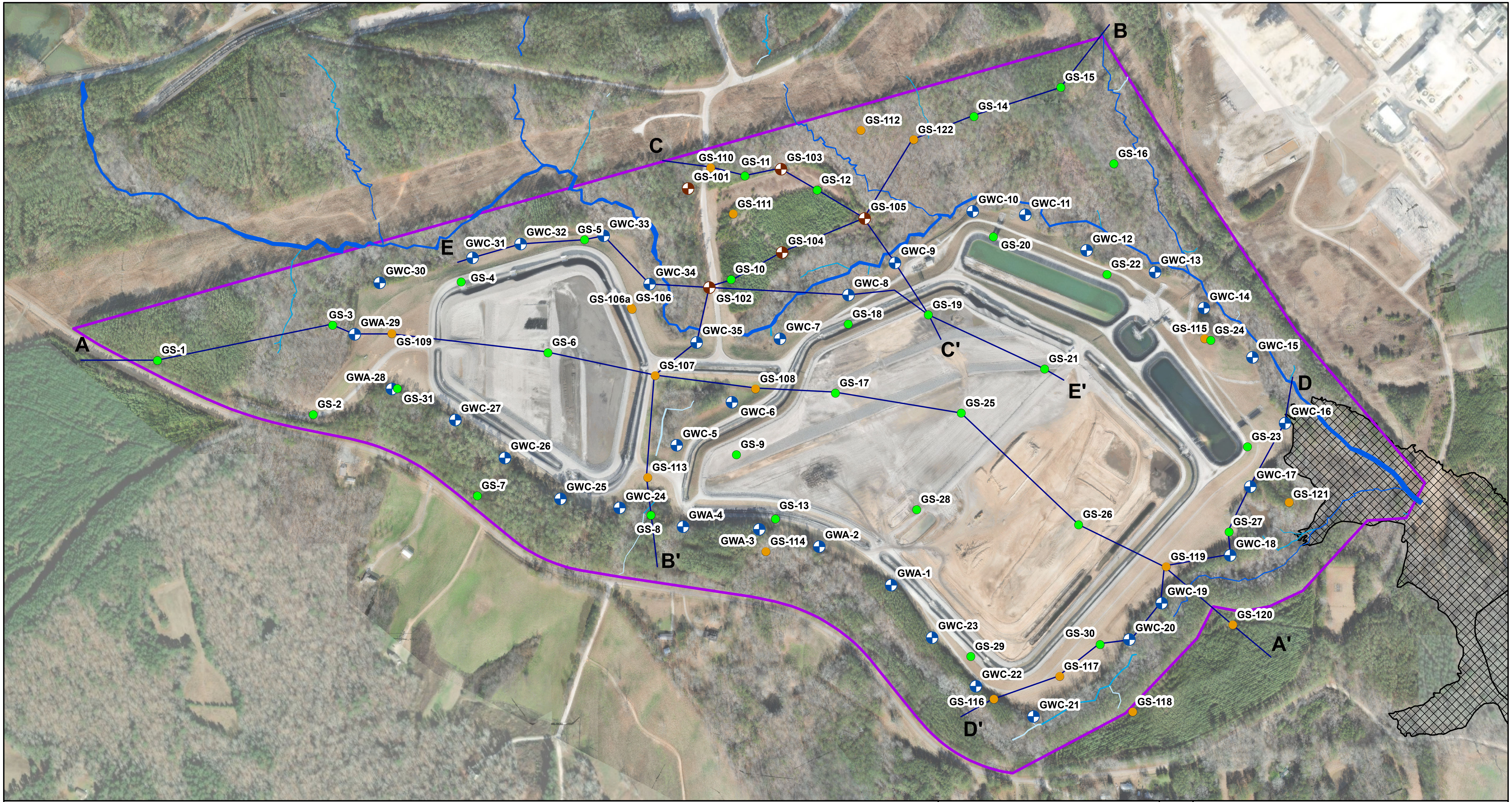
Prepared For: Georgia Power

Prepared By: Geosyntec consultants

Kennesaw, Ga | January 2024

Figure 2-2

N:\GA Power\Plant Wansley\GIS\MXD\Landfill Expansion\SAR Figure 2-2 Geotechnical Boring Locations.mxd 1/2/2024 10:38:50 AM



Legend

- Historical Boring/Piezometer
- Temporary Piezometer
- Existing Landfill Monitoring Well Network
- Geotechnical Boring
- Cross Section Line
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream
- Existing Landfill Permit Boundary
- 100 year Floodplain

0 300 600 1,200 Feet

N

Geologic Cross-Section Alignments

Georgia Power Company
1371 Liberty Church Road
Carrolton, Ga 30116

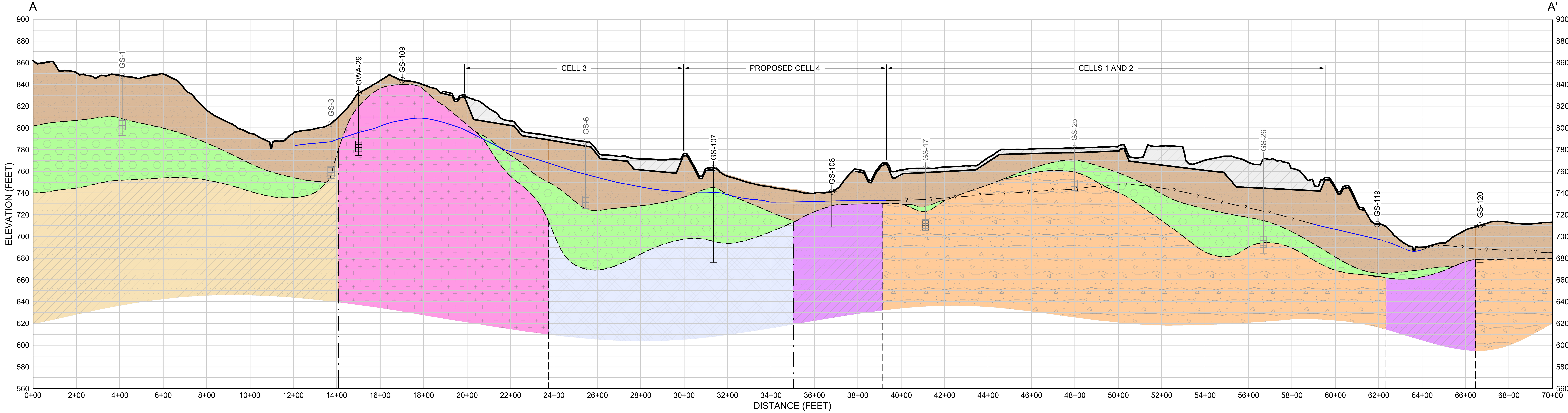
Prepared For: Georgia Power

Prepared By: Geosyntec consultants

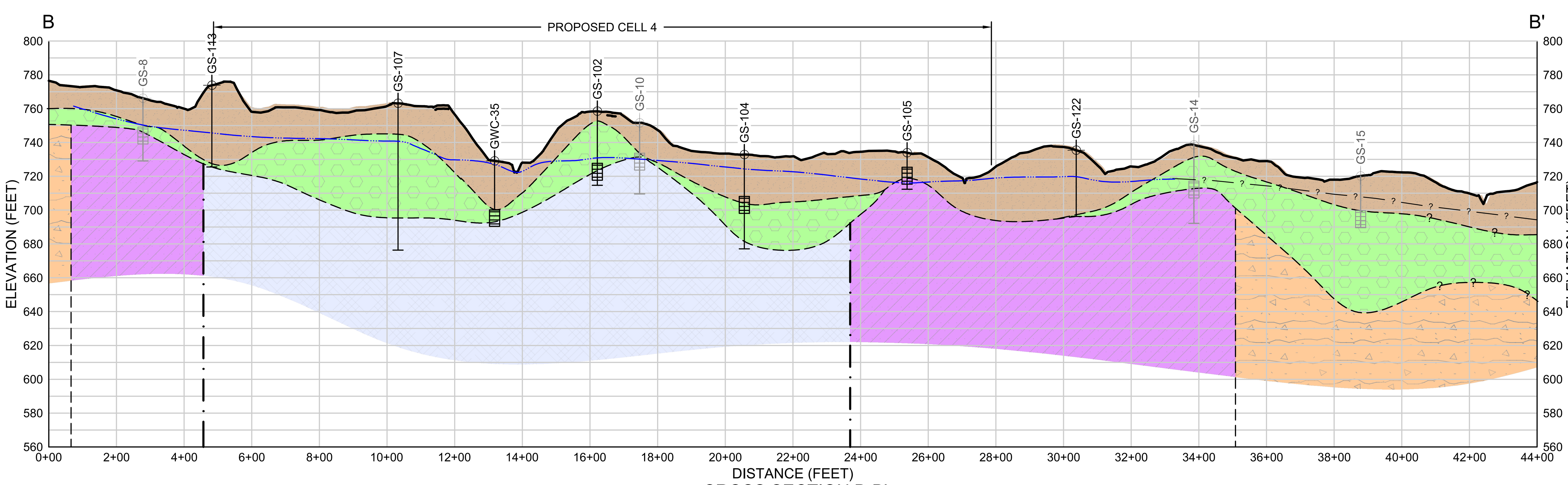
Kennesaw, Ga | January 2024

Figure 2-3

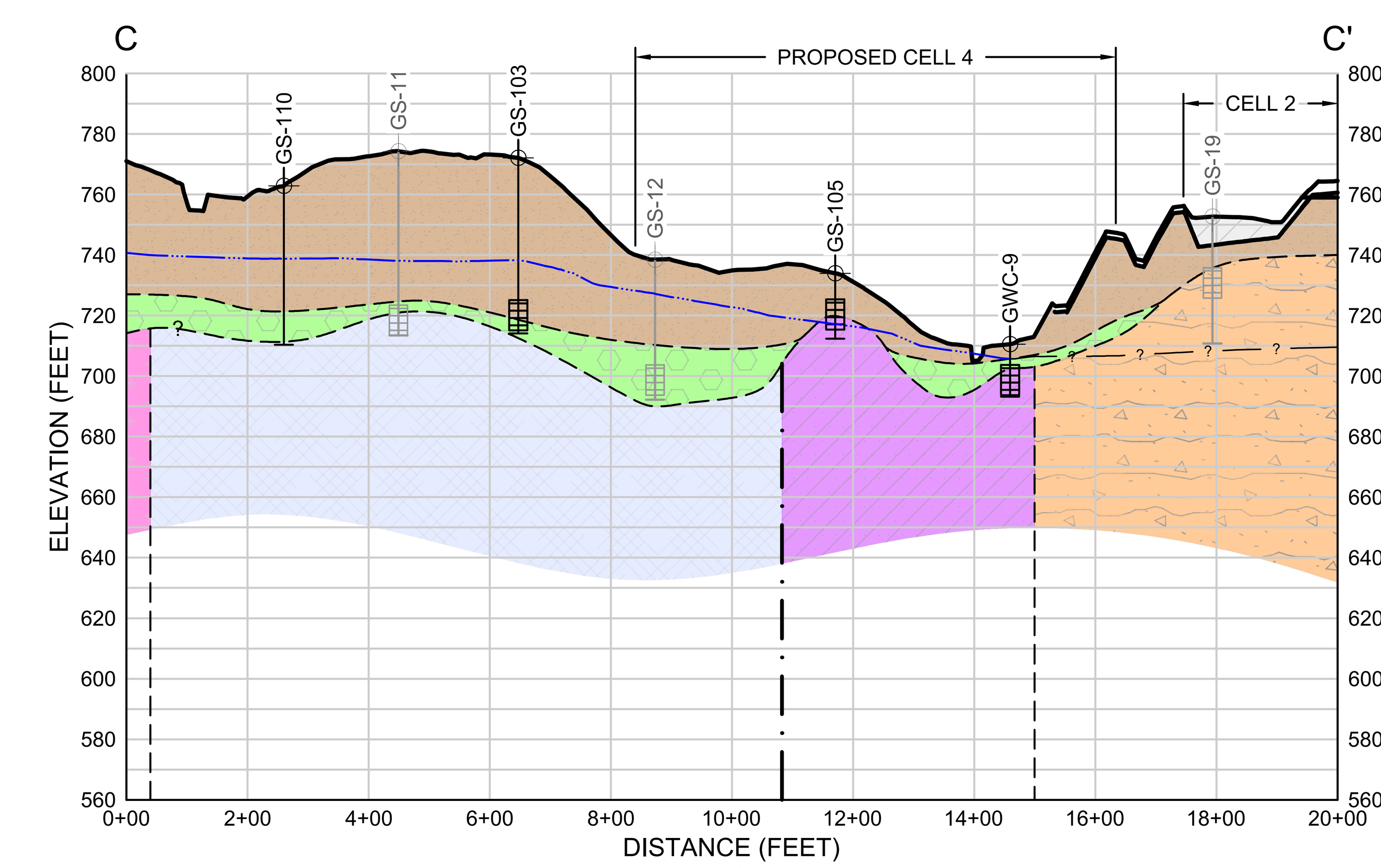
N:\GA Power\Plant Wansley\GIS\MXD\Landfill Expansion\SAR Figure XX Cross Sections.mxd 1/2/2024 10:59:37 AM



CROSS SECTION A-A'



CROSS SECTION B-B'



CROSS SECTION C-C'

LEGEND

	WELL SCREEN LOCATION
	SOIL BORING ON ALIGNMENT (GRAYED OUT IF ABANDONED)
	EXISTING GROUND ELEVATION - MARCH 2022
	GROUND WATER TABLE ELEVATION - MARCH 24, 2022
	INFERRED GROUND WATER TABLE ELEVATION
	LITHOLOGIC CONTACT
	INFERRED LITHOLOGIC CONTACT
	APPROXIMATE LOCATION OF FAULT

- GYPSUM
- RESIDUAL AND SAPROLITIC SOILS: SILT, SANDY SILT, SILTY SAND
- PARTIALLY WEATHERED ROCK (PWR)
- MUSCOVITE SCHIST
- GARNET SCHIST
- QUARTZITE
- SCHIST-AMPHIBOLITE
- LONG ISLAND CREEK GNEISS
- SHEARED BUTTON SCHIST
- BIOTITE GNEISS
- AMPHIBOLITE

NOTE:
BORINGS GS-1 THROUGH GS-31 WERE INSTAmLLED AS PART OF THE 2006 SITE INVESTIGATION AND ABANDONED FOLLOWING A YEAR OF WATER LEVEL COLLECTION.

0 250 500
SCALE IN FEET (H)

0 50 100
SCALE IN FEET (V)

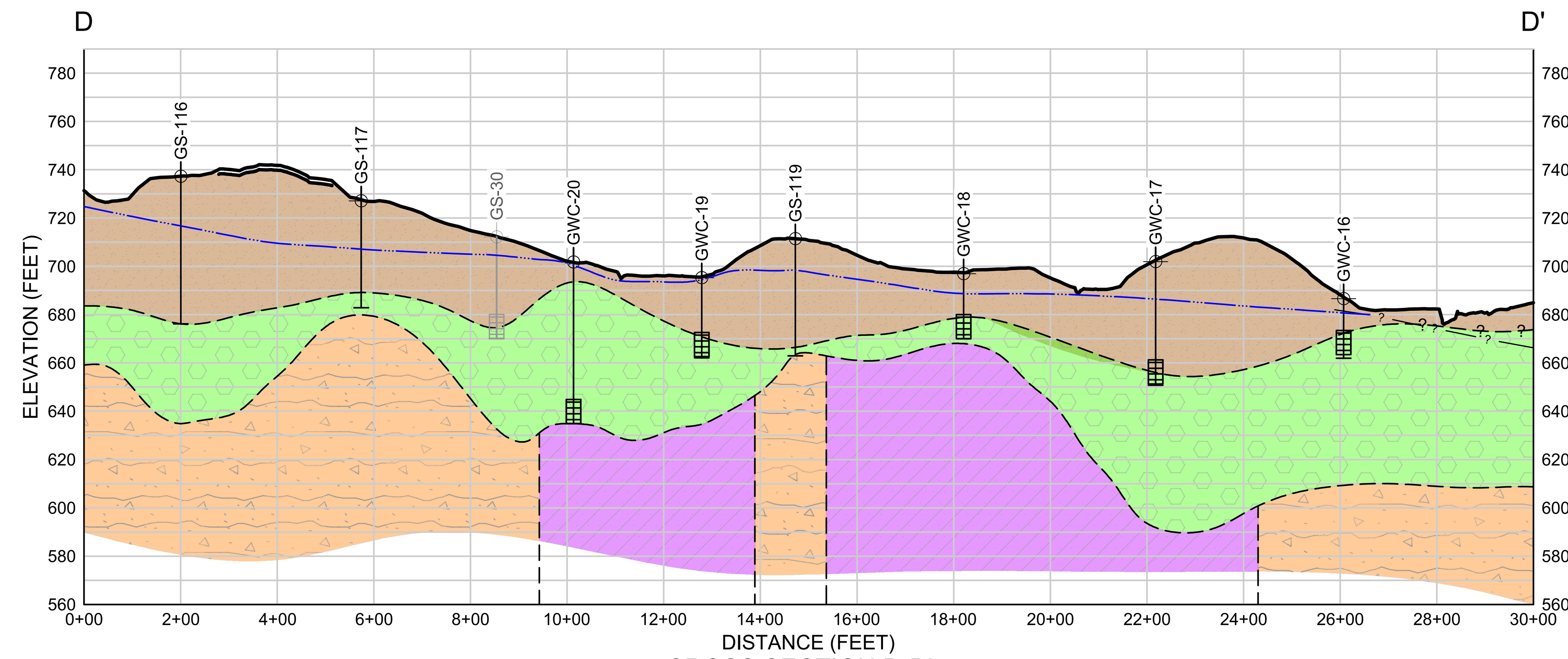
GEOLOGIC CROSS-SECTIONS
GEORGIA POWER COMPANY
1371 LIBERTY CHURCH ROAD
CARROLLTON, GA 30116

Geosyntec consultants

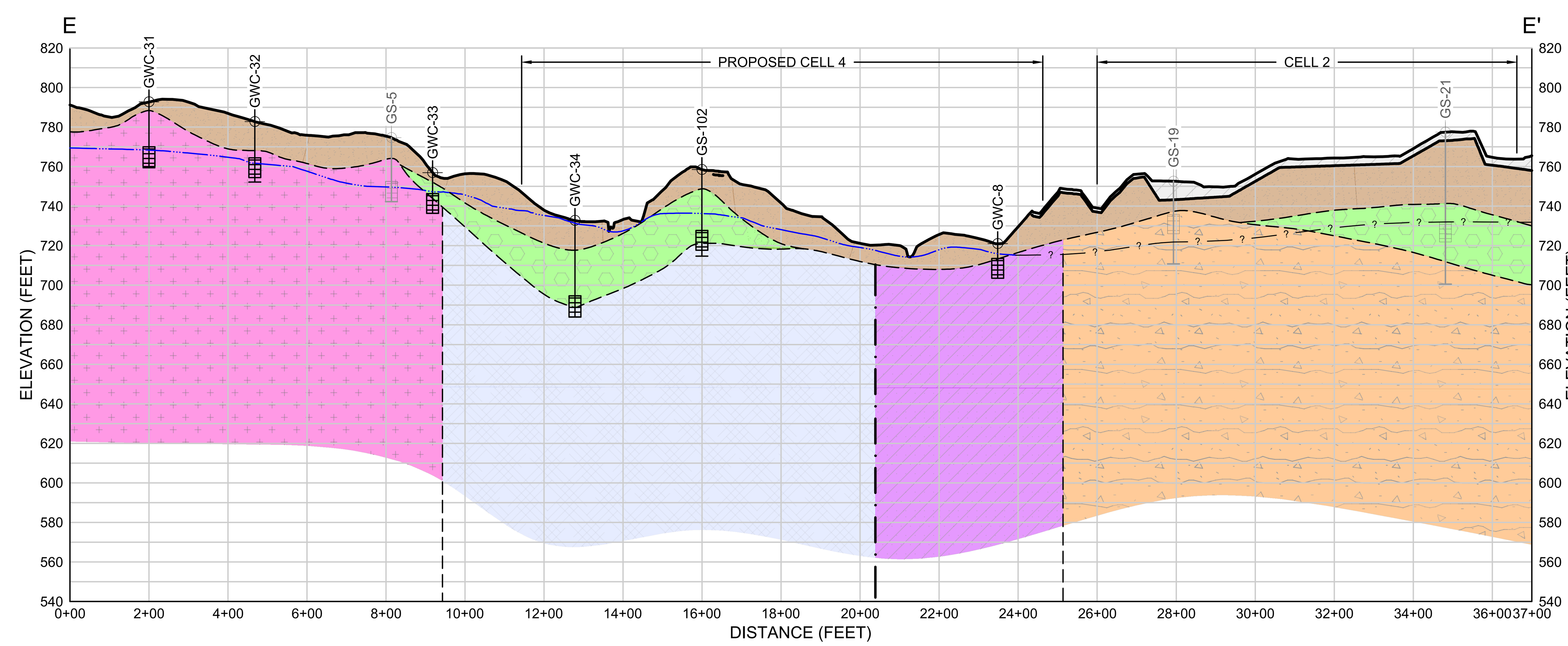
FIGURE 2-4A

PROJECT NO: GW7306.05 | JANUARY 2024

geosyntec-pw-01\Documents\Clients\G\GEORGIA POWER\GW7306 - PLANT WANSLEY DESIGN\CADD\05 - EXISTING LANDFILL INVESTIGATION\WORKING\SAR\FIGURES\GW7306.05_SAR-FIG004



CROSS SECTION D-D'



CROSS SECTION E-E'

LEGEND

- WELL SCREEN LOCATION
- SOIL BORING ON ALIGNMENT (GRAYED OUT IF ABANDONED)
- EXISTING GROUND ELEVATION - MARCH 2022
- GROUND WATER TABLE ELEVATION - MARCH 24, 2022
- INFERRED GROUND WATER TABLE ELEVATION
- LITHOLOGIC CONTACT
- INFERRED LITHOLOGIC CONTACT
- APPROXIMATE LOCATION OF FAULT
- GYPSUM
- RESIDUAL AND SAPROLITIC SOILS: SILT, SANDY SILT, SILTY SAND
- PARTIALLY WEATHERED ROCK (PWR)
- MUSCOVITE SCHIST
- GARNET SCHIST
- QUARTZITE
- SCHIST-AMPHIBOLITE
- LONG ISLAND CREEK GNEISS
- SHEARED BUTTON SCHIST
- BIOTITE GNEISS
- AMPHIBOLITE

NOTE:
BORINGS GS-1 THROUGH GS-31 WERE INSTAmLLED AS PART OF THE 2006 SITE INVESTIGATION AND ABANDONED FOLLOWING A YEAR OF WATER LEVEL COLLECTION.

0 250 500
SCALE IN FEET (H)

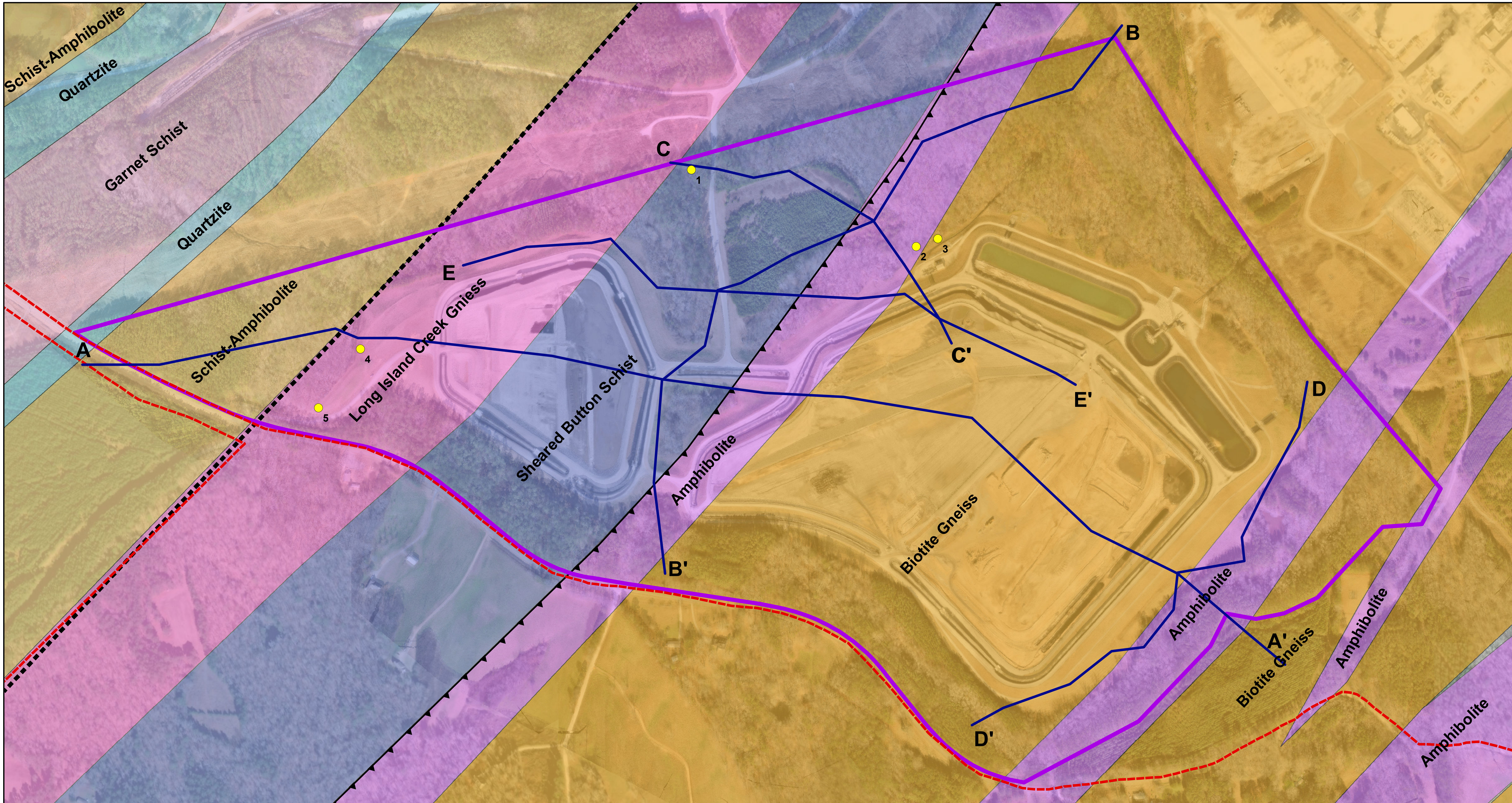
0 50 100
SCALE IN FEET (V)

GEOLOGIC CROSS-SECTIONS
GEORGIA POWER COMPANY
1371 LIBERTY CHURCH ROAD
CARROLLTON, GA 30116

Geosyntec consultants

FIGURE 2-4B

PROJECT NO: GW7306.05 | JANUARY 2024



Legend

- Strike and Dip Measurement (Geosyntec 2023)
- Cross Section Line
- Plant Boundary
- Existing Landfill Permit Boundary
- Strike-Slip Fault
- Thrust Fault
- Amphibolite
- Biotite Gneiss
- Garnet Schist
- Long Island Creek Gneiss
- Quartzite
- Schist-Amphibolite
- Sheared Button Schist

Measurement	Strike	Dip	Type
1	N61°E	30°SE	Joint
2	N28°E	33°SE	Foliation/Joint
3	N36°E	38°SE	Foliation/Joint
4	N60°E	77°SE	Foliation
5	N42°E	33°SE	Foliation

0 300 600 1,200 Feet

N

Site Geology

Georgia Power Company
1371 Liberty Church Road
Carrolton, Ga 30116

Prepared For: Georgia Power

Prepared By: Geosyntec consultants

Kennesaw, Ga | January 2024

Figure 2-5

N:\GA Power\Plant Wansley\GIS\MXD\Landfill Expansion\SAR Figure XX Site Geology.mxd 12/26/2023 10:38:28 AM

Legend

- Boring Location & Bedrock Elevation
- Bedrock Elevation
- (NAVD88) Existing Landfill
- 100 Year Floodplain

0 300 600 1,200 Feet

Site Location

Georgia

N

Elevation of Bedrock

Georgia Power Company
1371 Liberty Church Road
Carrolton, Ga 30116

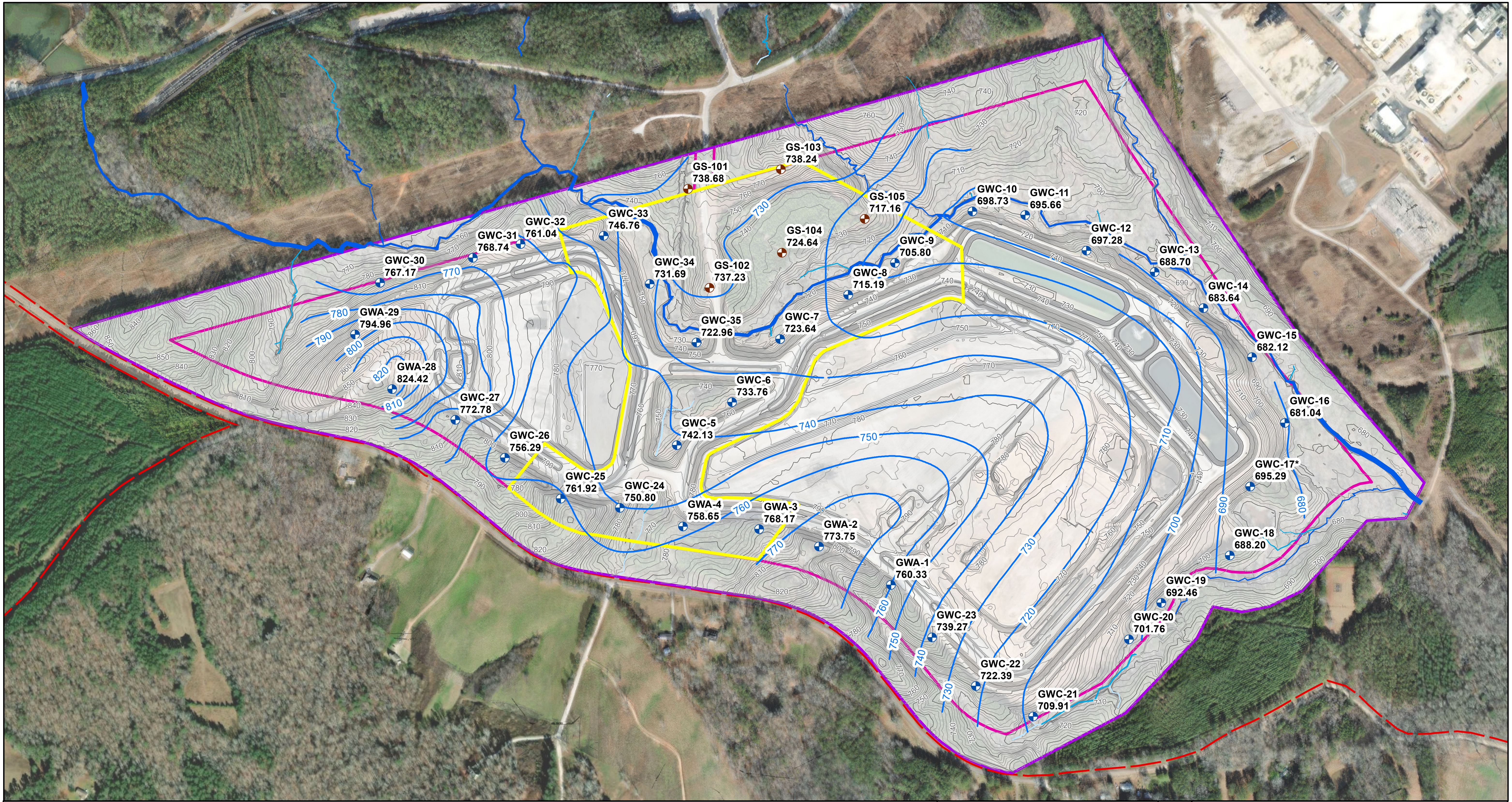
Prepared For: Georgia Power

Prepared By: Geosyntec consultants

Kennesaw, Ga | January 2024

Figure 2-6

N:\GA Power\Plant Wansley\GIS\MXD\Landfill Expansion\SAR Depth to Bedrock Surface.mxd 12/27/2023 10:33:38 AM



Legend

- Groundwater Elevation Iso-Contour (24 March 2022)
- Existing Landfill Monitoring Well Network
- Temporary Piezometer
- Approx. Limit of Proposed Cell 4 Development
- 200-Foot Undisturbed Buffer
- Existing Landfill Permit Boundary
- Property Boundary
- Perennial Stream
- Intermittent Stream
- Ephemeral Stream

1) Ground elevation contours based on 2023 Thompson survey.
* - Water level considered anomalous and not used for groundwater contouring.

0 300 600 1,200 Feet

Site Location

N

Potentiometeric Surface - 24 March 2022

Georgia Power Company
1371 Liberty Church Road
Carrolton, Ga 30116

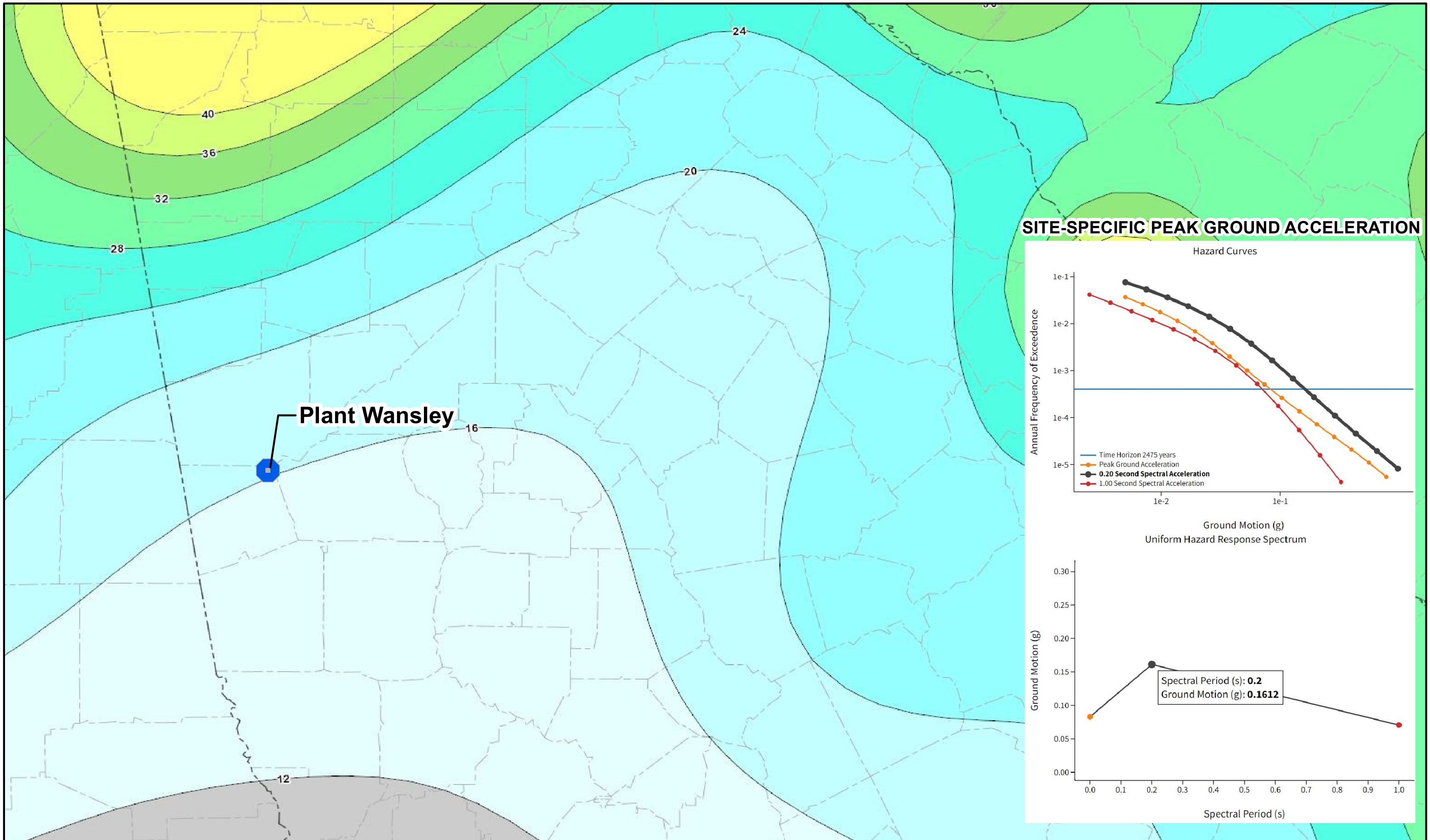
Prepared For: Georgia Power

Prepared By: Geosyntec consultants

Kennesaw, Ga | January 2024

Figure 2-7

N:\GA Power\Plant Wansley\GIS\MXD\Landfill Expansion\SAR Figure XX March2022 Pot Map_ACC_v2.mxd 1/2/2024 11:12:59 AM



Legend

—— Peak Ground Acceleration (%g)

140,000 70,000 0 140,000 Feet

Notes:
Peak ground acceleration contours (% of g) from https://earthquake.usgs.gov/hazards/interactive.
Contours consider an event with a 2% probability of exceedance in 50 years using the most recent model developed (2014).
Site-specific peak ground acceleration from the USGS Unified Hazard Tool for the Coterminous U.S. (v4.1.1, 2014).

Seismic Hazard Potential
Plant Wansley
Georgia Power Company
1371 Liberty Church Rd.
Carrollton, GA 30116

Geosyntec consultants

Kennesaw, GA | January 2024

Figure 2-8

N:\GA Power\Plant Wansley\GIS\MXD\Landfill Expansion\SAR Figure XX Seismic Hazard Map.mxd 2/25/2022 11:13:20 AM