

PRELIMINARY DETERMINATION

PERMIT MAJOR MODIFICATION

Chambers County Landfill, LLC
420 West 7th Street, P.O. Box 86
West Point, GA 31833

Chambers County Landfill
Permit No. 09-02

March 19, 2026

Browne and Company, LLC, on behalf of Chambers County Landfill, LLC, has submitted to the Alabama Department of Environmental Management (ADEM) a request to modify the Solid Waste Disposal Facility Permit for the Chambers County Landfill (Permit No. 09-02). The major modification would allow a western expansion of the disposal area of the landfill, increasing the disposal area by approximately 8.3 acres, from 19.6 acres to 27.9 acres. The permitted acreage of 50.5 acres would remain the same. They have also requested a variance from ADEM Admin. Code 335-13-4-.20(2)(c)2. requiring a maximum 4:1 (25%) final grade for the final closure system; they have requested a 3:1 (33.3%) final grade for the final closure system instead. The waste streams for Chambers County Landfill would remain non-putrescible and non-hazardous construction and demolition waste, yard debris, tires, and rubbish as defined by ADEM Admin. Code 335-13-1-.03, fiberglass manufacturing process waste, off-spec fiberglass insulation, and process waste from process equipment cleanout generated during the manufacture of fiberglass insulation from the Knauf Insulation Plant in Lanett, Alabama; foundry and core sand generated as part of foundry operations in the manufacture of auto parts at the HL Mando Plant in Hogansville, Georgia. The service area for the Chambers County Landfill would remain the states of Alabama and Georgia. The maximum average daily volume of waste disposed at the landfill would remain 2,500 tons per day. All other permit conditions would remain the same.

The landfill is located in the Northeast $\frac{1}{4}$ of the Southeast $\frac{1}{4}$ and the Southeast $\frac{1}{4}$ of the Northeast $\frac{1}{4}$ of Section 36, Township 22 North, Range 27 East in Chambers County, Alabama.

The Land Division has determined that the permit modification application complies with the applicable requirements of ADEM's Administrative Code 335-13 regulations for an industrial landfill.

Technical Contact:

Melissa H. Adornato
Solid Waste Engineering Section
Land Division
(334) 270-5605



SOLID WASTE DISPOSAL FACILITY PERMIT

PERMITTEE: Chambers County Landfill, LLC

FACILITY NAME: Chambers County Landfill

FACILITY LOCATION: Northeast ¼ of the Southeast ¼ and the Southeast ¼ of the Northeast ¼ of Section 36, Township 22 North, Range 27 East in Chambers County, Alabama. The total permitted area is approximately 50.5 acres with 27.9 acres approved for disposal.

PERMIT NUMBER: 09-02

PERMIT TYPE: Industrial

WASTE APPROVED FOR DISPOSAL: Non-putrescible and non-hazardous construction and demolition waste, yard debris, tires, and rubbish as defined by ADEM Admin. Code r. 335-13-1-.03, fiberglass manufacturing process waste, off-spec fiberglass insulation, and process waste from process equipment cleanout generated during the manufacture of fiberglass insulation from the Knauf Insulation Plant in Lanett, Alabama; foundry and core sand generated as part of foundry operations in the manufacture of auto parts at the HL Mando Plant in Hogansville, Georgia.

APPROVED WASTE VOLUME: Maximum Daily Volume of 2,500 tons per day

APPROVED SERVICE AREA: States of Alabama and Georgia

In accordance with and subject to the provisions of the Alabama Solid Wastes and Recyclable Materials Management Act, as amended, Code of Alabama 1975, SS 22-27-1 to 22-27-27 ("SWRMMA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, SS 22-22A-1 to 22-22A-15, and rules and regulations adopted thereunder, and subject further to the conditions set forth in this permit, the Permittee is hereby authorized to dispose of the above-described solid wastes at the above-described facility location.

ISSUANCE DATE: September 27, 2024

EFFECTIVE DATE: September 27, 2024

MODIFICATION DATE: ????????

EXPIRATION DATE: September 26, 2034

**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
SOLID WASTE PERMIT**

Permittee: Chambers County Landfill, LLC
420 West 7th Street, P.O. Box 86
West Point, GA 31833

Landfill Name: Chambers County Landfill

Landfill Location: A part of the Northeast ¼ of the Southeast ¼ and the Southeast ¼ of the Northeast ¼ of Section 36, Township 22 North, Range 27 East in Chambers County, Alabama

Permit Number: 09-02

Landfill Type: Industrial Landfill

Pursuant to the Alabama Solid Wastes and Recyclable Materials Management Act, Code of Alabama 1975, §§ 22- 27-1, *et seq.*, as amended, and attendant regulations promulgated thereunder by the Alabama Department of Environmental Management (ADEM), this permit is issued to Chambers County Landfill, LLC (hereinafter called the Permittee), to operate a solid waste disposal facility, known as the Chambers County Landfill.

The Permittee must comply with all terms and conditions of this permit. This permit consists of the conditions set forth herein (including those in any attachments), and the applicable regulations contained in Chapters 335-13-1 through 335-13-16 of the ADEM Administrative Code (hereinafter referred to as the “ADEM Admin. Code”). Rules cited are set forth in this document for the purpose of Permittee reference. Any Rule that is cited incorrectly in this document does not constitute grounds for noncompliance on the part of the Permittee. Applicable ADEM Administrative Codes are those that are in effect on the date of issuance of this permit or any revisions approved after permit issuance.

This permit is based on the information submitted to the Department on October 25, 2023, for permit renewal, and May 31, 2024, for permit major modification, and as amended, and known as the Permit Application (hereby incorporated by reference and hereinafter referred to as the Application). Any inaccuracies found in this information could lead to the termination or modification of this permit and potential enforcement action. The Permittee must inform the Department of any deviation from or changes in the information in the Application that would affect the Permittee's ability to comply with the applicable ADEM Admin. Code or permit conditions.

This permit is effective as of **September 27, 2024, modified XXXXXX**, and shall remain in effect until **September 26, 2034**, unless suspended or revoked.

Alabama Department of Environmental Management

Date Signed

SECTION I. STANDARD CONDITIONS

A. Effect of Permit

The Permittee is allowed to dispose of nonhazardous solid waste in accordance with the conditions of this permit and ADEM Admin. Code 335-13. Issuance of this permit does not convey property rights of any sort or any exclusive privilege, nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local laws or regulations. Except for actions brought under Code of Alabama 1975, §§ 22-27-1, *et seq.*, as amended, compliance with the conditions of this permit shall be deemed to be in compliance with applicable requirements in effect as of the date of issuance of this permit and any future revisions.

B. Permit Actions

This permit may be suspended, revoked, or modified for cause. The filing of a request for a permit modification or the notification of planned changes or anticipated noncompliance on the part of the Permittee, and the suspension or revocation does not stay the applicability or enforceability of any permit condition.

C. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

D. Definitions

For the purpose of this permit, terms used herein shall have the same meaning as those in ADEM Admin. Code 335-13, unless this permit specifically provides otherwise; where terms are not otherwise defined, the meaning associated with such terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

1. "EPA", for purposes of this permit, means the United States Environmental Protection Agency.
2. "Permit Application", for the purposes of this permit, means all permit application forms, design plans, operational plans, closure plans, technical data, reports, specifications, plats, geological and hydrological reports, and other materials which are submitted to the Department in pursuit of a solid waste disposal permit.

E. Duties and Requirements

1. Duty to Comply

The Permittee must comply with all conditions of this permit except to the extent and for the duration such noncompliance is authorized by a variance granted by the Department. Any permit noncompliance constitutes a violation of Code of Alabama 1975, §§ 22-27-1, *et seq.*, as amended, and is grounds for enforcement action, permit suspension, revocation, modification, and/or denial of a permit renewal application.

2. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The renewal application must be submitted to the Department at least one hundred eighty (180) days before this permit expires.

3. Permit Expiration

This permit and all conditions therein will remain in effect beyond the permit's expiration date if the Permittee has submitted a timely, complete application as required by Section I, Paragraph E, Subparagraph 2, and, through no fault of the Permittee, the Department has not made a final decision regarding the renewal application.

4. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of this permit.

5. Duty to Mitigate

In the event of noncompliance with this permit, the Permittee shall take all reasonable steps to minimize releases to the environment and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

6. Proper Operation and Maintenance

The Permittee shall, at all times, properly operate and maintain all facilities and systems of control (and related appurtenances) that are installed or used by the Permittee to achieve compliance with the conditions of this permit.

7. Duty to Provide Information

If requested, the Permittee shall furnish to the Department, within a reasonable time, any information that the Department may reasonably need to determine whether cause exists for denying, suspending, revoking, or modifying this permit, or to determine compliance with this permit. If requested, the Permittee shall also furnish the Department with copies of records kept as a requirement of this permit.

8. Inspection and Entry

Upon presentation of credentials and other documents as may be required by law, the Permittee shall allow the employees of the Department or their authorized representative to:

- a. Enter at reasonable times the Permittee's premises where the regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit.
- c. Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.
- d. Sample or monitor, at reasonable times, any substances or parameters at any location for the purposes of assuring permit compliance or as otherwise authorized by Code of Alabama 1975, §§ 22-27-1, *et seq.*

9. Monitoring, Corrective Actions, and Records

- a. Samples and measurements taken for the purpose of monitoring or corrective action shall be representative of the monitored activity. The methods used to obtain representative samples

to be analyzed must be the appropriate method from ADEM Admin. Code 335-13-4 or the methods as specified in the Application attached hereto and incorporated by reference. Laboratory methods must be those specified in Standard Methods for the Examination of Water and Wastewater (American Public Health Association, latest edition), Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020), Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA Publication SW-846, latest edition), other appropriate EPA methods, or as specified in the Application. All field tests must be conducted using approved EPA test kits and procedures.

- b. The Permittee shall retain records, at the location specified in Section I, Paragraph I, of all monitoring or corrective action information, including all calibration and maintenance records, copies of all reports and records required by this permit, and records of all data used to complete the application for this permit for a period of at least three years from the date of the sample, measurement, report or record, or for periods elsewhere specified in this permit. These periods may be extended by the request of the Department at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility.
- c. Records of monitoring and corrective action information shall include:
 - i. The exact place, date, and time of sampling or measurement.
 - ii. The individual(s) and company who performed the sampling or measurements.
 - iii. The date(s) analyses were performed.
 - iv. The individual(s) and company who performed the analyses.
 - v. The analytical techniques or methods used.
 - vi. The results of such analyses.
- d. The Permittee shall submit all monitoring and corrective action results at the interval specified elsewhere in this permit.

10. Reporting Planned Changes

The Permittee shall notify the Department, in the form of a request for permit modification, at least one hundred twenty (120) days prior to any change in the permitted service area, increase in the waste received, or change in the design or operating procedure as described in this permit, including any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

11. Transfer of Permit

This permit may be transferred to a new owner or operator. All requests for transfer of permits shall be in writing and shall be submitted on forms provided by the Department. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of this permit.

12. Certification of Construction

Before the Permittee may commence disposal of waste in any new cell or phase:

- a. The Permittee must submit a letter to the Department signed by both the Permittee and a professional engineer stating that the facility has been constructed in compliance with the permit.
- b. The Department must inspect the constructed cells or phases unless the Permittee is notified that the Department will waive the inspection.
- c. The Permittee may not commence disposal activities in any new cells or phases until approval of the new cells or phases is granted by the Department.

13. Noncompliance

The Permittee shall report all instances of noncompliance with the permit at the time noncompliance is discovered.

14. Other Information

If the Permittee becomes aware that information required by the Application was not submitted or was incorrect in the Application or in any report to the Department, the Permittee shall promptly submit such facts or information. In addition, upon request, the Permittee shall furnish to the Department, within a reasonable time, information related to compliance with the permit.

F. Design and Operation of Facility

The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of contaminants (including leachate and explosive gases) to air, soil, groundwater, or surface water, which could threaten human health or the environment.

G. Inspection Requirements

1. The Permittee shall comply with all requirements of ADEM Admin. Code 335-13-4-.21(1)(b).
2. The Permittee shall conduct random inspections of incoming loads.
3. Records of all inspections shall be included in the operating record.

H. Recordkeeping and Reporting

1. The Permittee shall maintain a written operating record at the location specified in Section I, Paragraph I. The operating record shall include:
 - a. Documentation of inspection and maintenance activities.
 - b. Daily Volume reports.
 - c. Personnel training documents and records.
 - d. Solid/Hazardous Waste Determination Forms for Industrial Wastes and associated ADEM disposal approval correspondence for industrial waste and special waste.
 - e. Groundwater monitoring records, if required.
 - f. Explosive gas monitoring records, if required.
 - g. Copies of this Permit and the Application.

- h. Copies of all variances granted by the Department, including copies of all approvals of special operating conditions.

2. Quarterly Volume Report

Beginning with the effective date of this permit, the Permittee shall submit, within thirty (30) days after the end of each calendar quarter, a report summarizing the daily waste receipts for the previous (just ended) quarter. Copies of the quarterly reports shall be maintained in the operating record.

3. Monitoring and Corrective Action Reports

The Permittee shall submit reports on all monitoring and corrective action activities conducted pursuant to the requirements of this permit, including, but not limited to, groundwater, surface water, explosive gas, and leachate monitoring. Groundwater monitoring is not required at this time, but if it is determined that monitoring is necessary, the Permittee shall conduct monitoring and submit reports as directed by the Department. Likewise, if necessary, explosive gas monitoring must be conducted and reports submitted as directed by the Department. Copies of the groundwater and explosive gas monitoring reports shall be maintained in the operating record.

4. Availability, Retention, and Disposition of Records

- a. All records, including plans, required under this permit or ADEM Admin. Code 335-13 must be furnished upon request and made available at reasonable times for inspection by any officer, employee, or representative of the Department.
- b. All records, including plans, required under this permit or ADEM Admin. Code 335-13 shall be retained by the Permittee for a period of at least three years. The retention period for all records is extended automatically during the course of any unresolved enforcement action regarding the facility, or as requested by the Department.
- c. A copy of records of waste disposal locations and quantities must be submitted to the Department and local land authority upon closure of the facility.

I. Documents to be maintained by the Permittee

The Permittee shall maintain, at the Chambers County Landfill office, the following documents and amendments, revisions, and modifications to these documents until an engineer certifies closure:

- 1. Operating record.
- 2. Closure Plan.

J. Mailing Location

All reports, notifications, or other submissions which are required by this permit should be sent via signed mail (i.e. certified mail, express mail delivery service, etc.) or hand delivered:

- 1. Mailing Address:
Chief, Solid Waste Branch, Land Division
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, AL 36130-1463

2. Physical Address:
Chief, Solid Waste Branch, Land Division
Alabama Department of Environmental Management
1400 Coliseum Blvd.
Montgomery, Alabama 36110-2400

K. Signatory Requirement

All applications, reports, or information required by this permit, or otherwise submitted to the Department, shall be signed and certified by the owner as follows:

1. If an individual, by the applicant.
2. If a city, county, or other municipality or governmental entity, by the ranking elected official or by a duly authorized representative of that person.
3. If a corporation, organization, or other legal entity, by a principal executive officer, of at least the level of Vice President, or by a duly authorized representative of that person.

L. Confidential Information

The Permittee may claim information submitted as confidential pursuant to ADEM Admin. Code 335-1-1-.06.

M. State Laws and Regulations

Nothing in this permit shall be construed to preclude the initiation of any legal action or to relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation.

SECTION II. GENERAL OPERATING CONDITIONS

A. Operation of Facility

The Permittee shall operate and maintain the disposal facility consistent with the Application, this permit, and ADEM Admin. Code 335-13.

B. Open Burning

The Permittee shall not allow open burning without prior written approval from the Department and other appropriate agencies. A burn request should be submitted in writing to the Department outlining why that burn request should be granted. This request should include, but not be limited to, specifically what areas will be utilized, types of waste to be burned, the projected starting and completion dates for the project, and the projected days and hours of operation. The approval, if granted, shall be included in the operating record.

C. Prevention of Unauthorized Disposal

The Permittee shall follow the approved procedures, as provided in the Application, for detecting and preventing the disposal of free liquids, regulated hazardous waste, PCBs, regulated medical waste, and other unauthorized waste streams at the facility.

D. Unauthorized Discharge

The Permittee shall operate the disposal facility in such a manner that there will be no water pollution or unauthorized discharge. Any discharge from the disposal facility, or practice thereof, may require a National Pollutant Discharge Elimination System permit under the Alabama Water Pollution Control Act.

E. Industrial Waste Disposal

The Permittee shall dispose of industrial waste as required by ADEM Admin. Code 335-13-4-.21(1)(c) and as specified in the Application.

F. Boundary Markers

The Permittee shall ensure that the facility is identified with a sufficient number of permanent boundary markers that are at least visible from one marker to the next.

G. Certified Operator

The Permittee shall be required to have an operator certified by the Department on-site during hours of operation, in accordance with the requirements of ADEM Admin. Code 335-13-12.

SECTION III. SPECIFIC REQUIREMENTS FOR INDUSTRIAL WASTE LANDFILLS

A. Waste Identification and Management

1. Subject to the terms of this permit, the Permittee may dispose of the nonhazardous solid wastes listed in Section III, Paragraph B. Disposal of any other wastes is prohibited, except waste granted a temporary or one-time waiver by the Director.
2. The total permitted area for the Chambers County Landfill is approximately 50.5 acres, with approximately 27.9 acres permitted for disposal operations.
3. The maximum average daily volume of waste disposed at the facility shall not exceed 2,500 tons per day. Should the average daily volume exceed this value by 20% or 100 tons/day, whichever is less, for two (2) consecutive quarters, the Permittee shall be required to modify the permit in accordance with ADEM Admin. Code 335-13-5-.06(2)(b)2. An increase in maximum average daily volume shall not be approved by ADEM unless the Permittee has received local approval for the increased maximum average daily volume. The average daily volume shall be computed as specified by ADEM Admin. Code 335-13-4-.23(2)(f).

B. Waste Streams

The Permittee may accept for disposal non-putrescible and non-hazardous construction and demolition waste, yard debris, tires, and rubbish as defined by ADEM Admin. Code 335-13-1-.03, fiberglass manufacturing process waste, off-spec fiberglass insulation, and process waste from process equipment cleanout generated during the manufacture of fiberglass insulation from the Knauf Insulation Plant in Lanett, Alabama; foundry and core sand generated as part of foundry operations in the manufacture of auto parts at the HL Mando Plant in Hogansville, Georgia, in accordance with ADEM Admin. Code 335-13-4-.26(3). (See Section VIII, Paragraph 1.) Special waste approved by ADEM may also be accepted.

C. Service Area:

The Permittee is allowed to receive for disposal waste from the states of Alabama and Georgia.

D. Waste Placement, Compaction, and Cover

All waste shall be confined to an area as small as possible within a single working face and placed onto an appropriate slope not to exceed 4 to 1 (25%) or as otherwise approved by the Department. All waste shall be spread in layers two feet or less in thickness and thoroughly compacted weekly with adequate landfill equipment prior to placing additional layers of waste or placing the weekly cover. A minimum of six inches of compacted earth or other alternative cover material approved by the Department and listed in Section VIII shall be added at the conclusion of each week's operation unless a variance is granted in Section VIII.

E. Liner Requirements

At this time, the Permittee shall not be required to install a liner system. The base of the landfill shall be a minimum of five (5) feet above the highest measurement of the groundwater level as determined by ADEM Admin. Code 335-13-4-.11(2)(a).

F. Security

The Permittee shall provide artificial and/or natural barriers, which prevent entry of unauthorized vehicular traffic to the facility.

G. All Weather Access Roads

The Permittee shall provide an all-weather access road to the dumping face that is wide enough to allow passage of collection vehicles.

H. Adverse Weather Disposal

The Permittee shall provide for disposal activities in adverse weather conditions.

I. Personnel

The Permittee shall maintain adequate personnel to ensure continued and smooth operation of the facility.

J. Environmental Monitoring and Treatment Structures

The Permittee shall provide protection and proper maintenance of environmental monitoring and treatment structures.

K. Vector Control

The Permittee shall provide for vector control as required by ADEM Admin. Code 335-13.

L. Bulk or Noncontainerized Liquid Waste

The Permittee shall not dispose of bulk or noncontainerized liquid waste, or containers capable of holding liquids, unless the conditions of ADEM Admin. Code 335-13-4-.23(1)(j) are met.

M. Empty Containers

Empty containers larger than 10 gallons in size must be rendered unsuitable for holding liquids prior to disposal in the landfill unless otherwise approved by the Department.

N. Other Requirements

The Department may enhance or reduce any requirements for operating and maintaining the landfill as deemed necessary by the Land Division.

O. Other Permits

The Permittee shall operate the landfill according to this and any other applicable permits.

P. Scavenging and Salvaging Operations

The Permittee shall prevent scavenging and salvaging operations, except as part of a controlled recycling effort. Any recycling operation must be in accordance with plans submitted and approved by the Department.

Q. Signs

If the landfill is available to the public or commercial haulers, the Permittee shall provide a sign outlining instructions for use of the site. The sign shall be posted and have the information required by ADEM Admin. Code 335-13-4-.23(1)(f).

R. Litter Control

The Permittee shall control litter.

S. Fire Control

The Permittee shall provide fire control measures.

SECTION IV. GROUNDWATER MONITORING REQUIREMENTS:

Groundwater monitoring is not required at this landfill provided that the waste stream is in accordance with Section III, Paragraph B. Should any waste be disposed other than the waste streams indicated in Section III, Paragraph B, the Department may require that groundwater monitoring wells be installed.

SECTION V. GAS MONITORING REQUIREMENTS

The permittee must install and maintain an explosive gas monitoring system in accordance with ADEM Admin. Code 335-13.

SECTION VI. SURFACE WATER MANAGEMENT

The Permittee shall construct and maintain run-on and run-off control structures to control the discharge of pollutants in stormwater. Any discharges from drainage control structures shall be permitted through a discharge permit issued by the ADEM Water Division.

SECTION VII. CLOSURE AND POST-CLOSURE REQUIREMENTS

The Permittee shall close the landfill and perform post-closure care of the landfill in accordance with ADEM Admin. Code 335-13.

A. Final Cover

The Permittee shall grade final soil cover such that surface water does not pond over the permitted area as specified in the Application. The final cover system shall comply with ADEM Admin. Code 335-13. The Permittee has been granted a variance from ADEM Admin. Code 335-13-4-.20(2)(c)2. requiring a maximum 4 to 1 (25%) final grade for the final closure system. The final cover system shall not exceed a final grade of 3 to 1 (33.3%). (See Section VIII, Paragraph 2.)

B. Vegetative Cover

The Permittee shall establish a vegetative or other appropriate cover, as approved by the Department, within ninety (90) days after completion of final grading requirements in the Application. Preparation of a vegetative cover shall include, but not be limited to, the placement of seed, fertilizer, mulch, and water.

C. Notice of Intent

The Permittee shall place in the operating record and notify the Department of their intent to close the landfill prior to beginning closure.

D. Completion of Closure Activities

The Permittee must complete closure activities of each landfill unit in accordance with the Closure Plan within one hundred eighty (180) days of the last known receipt of waste.

E. Certification of Closure

Following closure of each unit, the Permittee must submit to the Department a certification, signed by a registered professional engineer, verifying the closure has been completed according to the Closure Plan.

F. Post-Closure Care Period

Post-closure care activities shall be conducted after closure of each unit throughout the life of this permit and continuing for a period of a minimum of thirty (30) years following closure of the facility. The Department may shorten or extend the post-closure care period applicable to the solid waste disposal facility.

G. Post-Closure Maintenance

The Permittee shall provide post-closure maintenance of the facility to include regularly scheduled inspections. This shall include maintenance of the cover, vegetation, monitoring devices and pollution control equipment, and correction of other deficiencies that may be observed by the Department. Monitoring requirements shall continue throughout the post-closure period as determined by the Department unless all waste is removed and no unpermitted discharge to waters of the State has occurred.

H. Post-Closure Use of Property

The Permittee shall ensure that post-closure use of the property never be allowed to disturb the integrity of the final cover, liner, or any other component of the containment system. This shall preclude the growing of deep-rooted vegetation on the closed area.

I. Certification of Post-Closure

Following post-closure of each unit, the Permittee must submit to the Department a certification, signed by an independent registered professional engineer, verifying the post-closure has been completed according to

the Post-Closure Plan.

J. Recording Instruments

The Permittee must provide documentation of compliance with the requirements of the Uniform Environmental Covenants Program in ADEM Admin Code 335-5 and shall execute the following:

1. Record a notation onto the land deed within ninety (90) days from the certification of closure. This notation shall state that the land has been used as a solid waste disposal facility, the name of the Permittee, type of disposal activity, location of the disposal facility, and beginning and closure dates of the disposal activity.
2. File the covenant at the courthouse where the land deed is held within thirty (30) days of receipt of the covenant signed by ADEM's Land Division Chief.
3. The Permittee shall submit a certified copy of the recording instrument to ADEM within one hundred twenty (120) days after permit expiration, revocation, or as directed by ADEM as described in the Application.

K. Removal of Waste

If the Permittee, or any other person(s), wishes to remove waste, waste residues, or any liner or contaminated soils, the owner must request and receive prior approval from the Department.

SECTION VIII. VARIANCES AND SPECIAL CONDITIONS

1. The foundry and core sand must undergo a quarterly TCLP (Toxicity Characteristic Leaching Procedure) analysis for the RCRA (Resource Conservation and Recovery Act) 8 metals, submit each analysis to the Department, and maintain a copy in the landfill's operating records. (See Section III, Paragraph B.)
2. The Permittee has been granted a variance from ADEM Admin. Code 335-13-4-.20(2)(c)2. requiring a maximum 4 to 1 (25%) final grade for the final closure system. The final cover system shall not exceed a final grade of 3 to 1 (33.3%). (See Section VII, Paragraph A.)

Any variance granted by the Department may be terminated by the Department whenever the Department finds, after notice and opportunity for hearing, that the petitioner is in violation of any requirement, condition, schedule, limitation or any other provision of the variance, or that operation under the variance does not meet the minimum requirements established by state and federal laws and regulations or is unreasonably threatening the public health.

Permit No. 09-02 Major

Modification Application

BROWNE
AND COMPANY, LLC
3312 Northside Drive • Bldg D, Suite 220
Macon, Georgia 31210
Phone: 478-743-4843 Browne1234@aol.com

May 31, 2024

Ms. Melissa H. Adornato
Solid Waste Engineering Section, Land Division
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, Alabama 36130-1463

**Re: West Expansion Application
Chambers County Landfill
Permit No. 09-02
Proj. No. 505-41-0104**

Dear Ms. Adornato:

On behalf of Chambers County Landfill, LLC, Permittee and Operator of the Chambers County Landfill, we are submitting a Solid Waste Disposal Facility Permit Application Package to expand the disposal footprint within the existing permitted property.

We have enclosed the following information and documents for your review:

- A completed application form (ADEM Form 439), with a location map
- A list of adjacent landowners and drawing showing the site and adjacent landowners
- Application Support Documents
- Revised Facility Permit Drawings

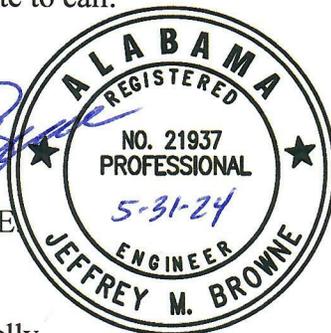
A fee in the amount of \$4,375 for the required Major Modification fee will be provided under separate cover.

We certify that the information contained in this application is accurate. If you have any questions, please do hesitate to call.

Sincerely,



Jeff Browne, P.E.
President



cc: Jared Kelly
Charles M. Russell, III
Nathan Dunn

**SOLID WASTE DISPOSAL FACILITY
PERMIT APPLICATION PACKAGE**

January 16, 2018

MEMORANDUM

TO: Applicants Seeking a Permit for Solid Waste Facilities

FROM: Stephen A. Cobb, Chief
Land Division
Alabama Department of Environmental Management

RE: Processing Solid Waste Permits by ADEM

Any permit issued by ADEM must be in accordance with §22-27-48 and §22-27-48.1 Code of Alabama. This section indicates that ADEM may not consider an application for a new or modified permit unless such application has received approval by the affected unit of local government having an approved plan. ADEM, therefore, will require the following before it can process a new or modified permit application:

1. The local government having jurisdiction must approve the permit application in accordance with §22-27-48 and §22-27-48.1 Code of Alabama.
2. Local governments should follow the procedures outlined in §22-27-48 and §22-27-48.1 Code of Alabama and the siting standards included in the local approved plan in considering approval of a facility.

This procedure applies to applications for new or modified permits. ADEM cannot review an application unless it includes approval from the affected local government. This procedure shall not apply to exempted industrial landfills receiving waste generated on site only by the permittee.

Please contact the Solid Waste Branch of ADEM at (334) 274-4201 if there are any questions.

SAC/sss/abj

SOLID WASTE APPLICATION

PERMIT APPLICATION
SOLID WASTE DISPOSAL FACILITY
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
(Submit in Triplicate)

1. Facility type: Municipal Solid Waste Landfill (MSWLF)
 Industrial Landfill (ILF)
 Construction and Demolition Landfill (C/DLF)
 CCR Landfill (CCRLF)
 CCR Surface Impoundment (CCRSI)
 Other (explain) _____

2. Facility Name Chambers County Landfill

3. Applicant/Permittee:

Name: Chambers County Landfill, LLC

Address: 420 W. 7th Street P.O. Box 86
West Point, GA 31833

Telephone: (205) 788-1400

If applicant/permittee is a Corporation, please list officers:

Charles M. Russell, III CEO

4. Location: (include county highway map or USGS map)

Township 22N Range 28E & 27E
Section 31 & 32 County Chambers Co. State Highway 50

5. Land Owner:

Name: Chambers County

Address: 2 South LaFayette Street
LaFayette, AL 36862

Telephone: (334) 864-4311

(Attach copy of agreement from landowner if applicable.)

Solid Waste Permit Application
Page 2

6. Contact Person:

Name Nathan Dunn

Position or Affiliation Vice President - Post Collection Operations

Address: 420 West 7th Street, P.O. Box 86
West Point, GA 31833

Telephone: (334) 209-3776

7. Size of Facility: 50.48 Acres Size of Disposal Area(s): 27.9 Acres

8. Identify proposed service area or specific industry that waste will be received from:

States of Alabama and Georgia

9. Proposed maximum average daily volume to be received at landfill (choose one):

2500 Tons/Day _____ Cubic Yards/Day

10. List all waste streams to be accepted at the facility (i.e., household solid waste, wood boiler ash, tires, trees, limbs, stumps, etc.):

Non-putrescible and non-hazardous construction and demolition waste, yard debris, tires, and rubbish as defined by ADEM Rule 335-13-1-.03, waste from fiberglass manufacturing process waste, off-spec fiberglass insulation, and process waste from process equipment cleanout generated during the manufacture of fiberglass insulation from the Knauf Insulation Plant in Lanett, Alabama; foundry and core sand generated as part of foundry operations in the manufacture of auto parts at the HL Mando Plant in Hogansville, Georgia.

SIGNATURE (Responsible official of permit applicant):

 TITLE: VP - Post Collections

Nathan Dunn DATE: 5/31/24
(please print or type name)

ADDITIONAL REQUIRED INFORMATION

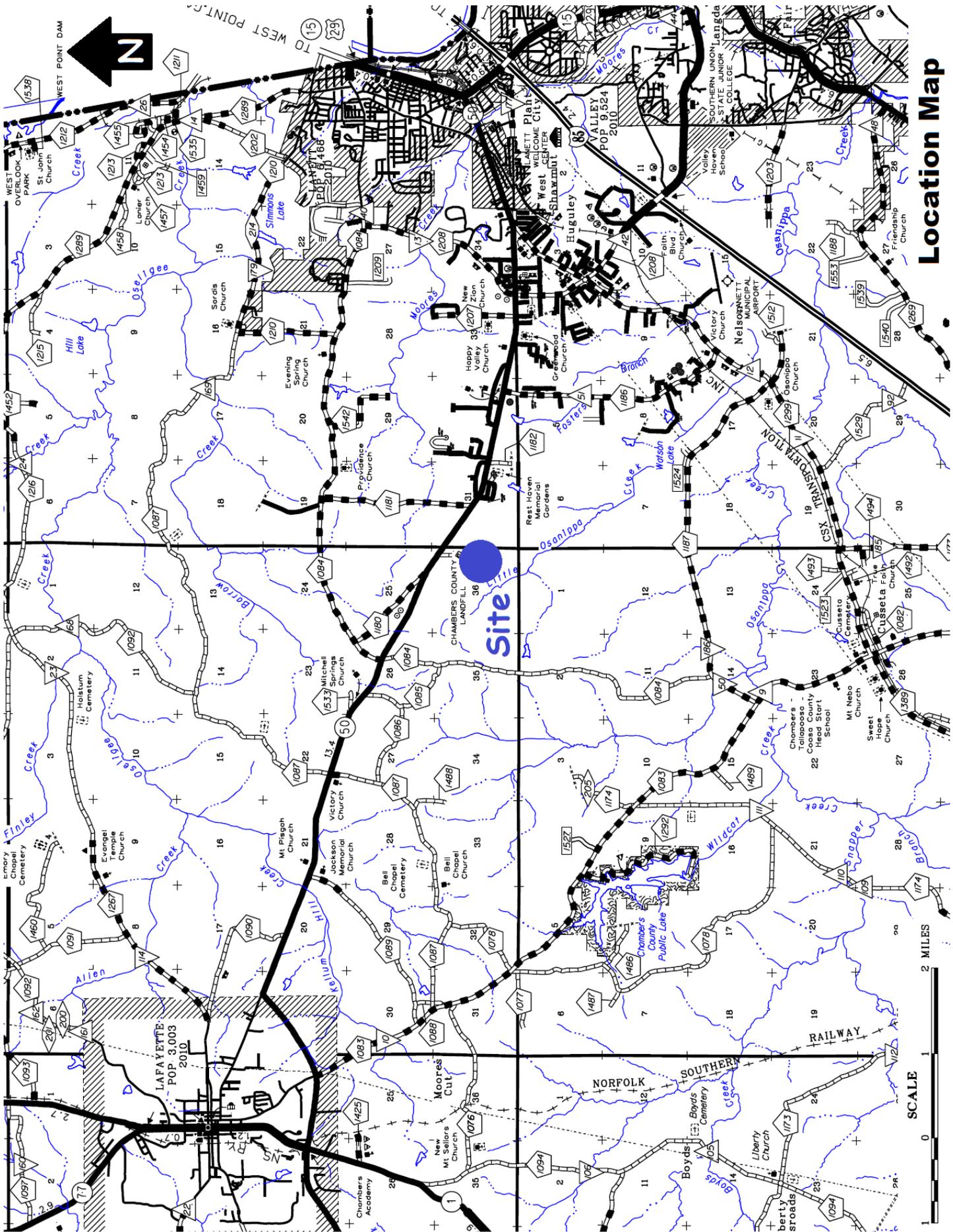
Applicants seeking to obtain a permit to construct and/or continue to operate a municipal solid waste (MSW) landfill, industrial landfill, construction and demolition (C/D) landfill, coal combustion residuals (CCR) landfill, or CCR surface impoundment are required to submit additional information as part of the Solid Waste Disposal Facility Permit Application. These additional information requirements vary depending on the facility type.

For new and existing landfill units, refer to ADEM Admin Code 335-13-5-.02 for a list of additional information to be submitted in the permit application. Some requirements apply only to MSW landfills and CCR landfills, while other requirements apply to industrial landfills and C/D landfills. You need only to address the requirements that pertain to your type landfill. For new and existing CCR surface impoundments, refer to ADEM Admin Code 335-13-15-.09 for additional information to be submitted in the permit application.

Each rule that is applicable to your type landfill or surface impoundment must be addressed in detail in the operational narrative and/or engineering drawings before the review process can be completed. All operational narratives, engineering drawings, survey maps and legal descriptions are to be prepared by licensed engineers or surveyors registered in the State of Alabama and with their stamp or seal on each drawing/map and cover of the narrative.

Act No. 89-824 Section 9(a) states "The department may not consider an application for a new or modified permit for a facility unless such application has received approval by the affected unit of local government having an approved plan." This document must be received by the Department prior to processing the application.

The referenced rules are covered in greater detail in ADEM's Administrative Code, Division 13. Clarification can be obtained by reviewing the regulations. Copies of the ADEM Administrative Code, Division 13 regulations, can be obtained for a fee by contacting ADEM's Permits and Services Division. If the Department can answer any questions, please contact the Solid Waste Branch at (334) 274-4201.



Location Map

SCALE 0 1 2 MILES

Parcel ID MAP

Source: <https://www.alabamagis.com/Chambers/>
Chambers County, AL Revenue Commissioner



7-36-6

7-36-4

7-36-1

9-31-3.011

SITE

9-31-3.003

9-31-3.001

7-36-6.001

7-36-7.000

9-31-75

1-1-1

3-6-2

Adjacent Landowners: Chambers County C&D Landfill
May 31, 2024

| <u>Parcel ID</u> | <u>Owner Name / Address</u> |
|---|---|
| 12 11 07 36 0 000 001.000 (7-36-1) | Fuller, Shelia & Todd 8060 Veterans Memorial Parkway Lanett, AL 36863 |
| 12 10 09 31 0 001 003.001 (9-31-3.001) | Lynn, Ricky & Tamra 5745 26th Avenue Valley, AL 36854 |
| 12 10 09 31 0 001 003.011 (9-31-3.011) | Mattter Management, LLC 1400 Porter Road Mulga, AL 35118 |
| 12 10 09 31 0 001 003.003 (9-31-3.002) | Chambers County Alabama 18 Alabama Avenue E. LaFayette, AL 36862 |
| 12 10 09 31 0 001 075.000 (9-31-75) | Hennon King Properties LLC P.O. Box 348 LaFayette, AL 36862 |
| 12 17 03 06 0 000 002.000 (3-6-2) | Hennon King Properties LLC P.O. Box 348 LaFayette, AL 36862 |
| 12 16 01 01 0 000 001.000 (1-1-1) | Hennon King Properties LLC P.O. Box 348 LaFayette, AL 36862 |
| 12 11 07 36 0 000 006.001 (7-36-6.001) | Hennon King Properties LLC P.O. Box 348 LaFayette, AL 36862 |
| 12 11 07 36 0 000 006.000 (7-36-6) | Clark, Christopher S. P.O. Box 874 Lanett, AL 36863 |
| 12 11 07 36 0 000 007.000 (7-36-7.000) | City of Lanett Alabama P.O. Box 290 Lanett, AL 36863 |
| 12 11 07 36 0 000 004.000 (7-36-4) | Chris Clark Properties, LLC P.O. Box 874 Lanett, AL 36863 |

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BROWNE
AND COMPANY, LLC

3312 Northside Drive • Building D, Suite 220
Macon, Georgia 31210 Ph/Fx: 478-743-4843

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

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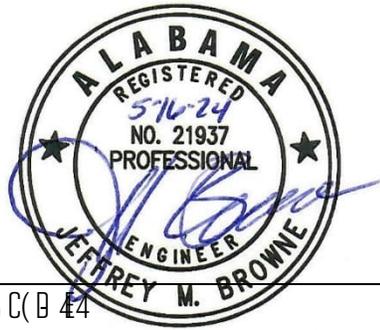
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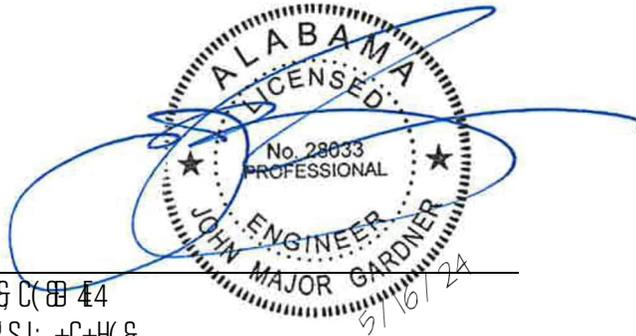
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Table of Contents

- I. Application Form
- II. Landfill Siting Standards
 - A. FIRM 100-Year Flood Map (*previously submitted November 11, 2020*)
 - B. Waters of the US and Endangered Species Act Site Review (*by Inver Environmental Consulting, LLC*).
 - C. Limited Hydrogeologic Assessment (*by Bunnell-Lammons Engineering, Inc.*)
 - D. Phase I Cultural Resources Survey (*by TerraXplorations, Inc.*)
- III. Operations Plan
 - A. Unauthorized Waste Identification Plan
- IV. Erosion and Sedimentation Control Calculations
- V. Variance Request for Final Cover
 - A. RUSLE Soil Loss Calculation
 - B. Slope Stability Evaluation
 - C. Final Cover Diversion Flow and Lining Calculation

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**SOLID WASTE DISPOSAL FACILITY
PERMIT APPLICATION PACKAGE**

January 16, 2018

MEMORANDUM

TO: Applicants Seeking a Permit for Solid Waste Facilities

FROM: Stephen A. Cobb, Chief
Land Division
Alabama Department of Environmental Management

RE: Processing Solid Waste Permits by ADEM

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SAC/sss/abj

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 TITLE: VP - Post Collections

Nathan Dunn DATE: 5/31/24
(please print or type name)

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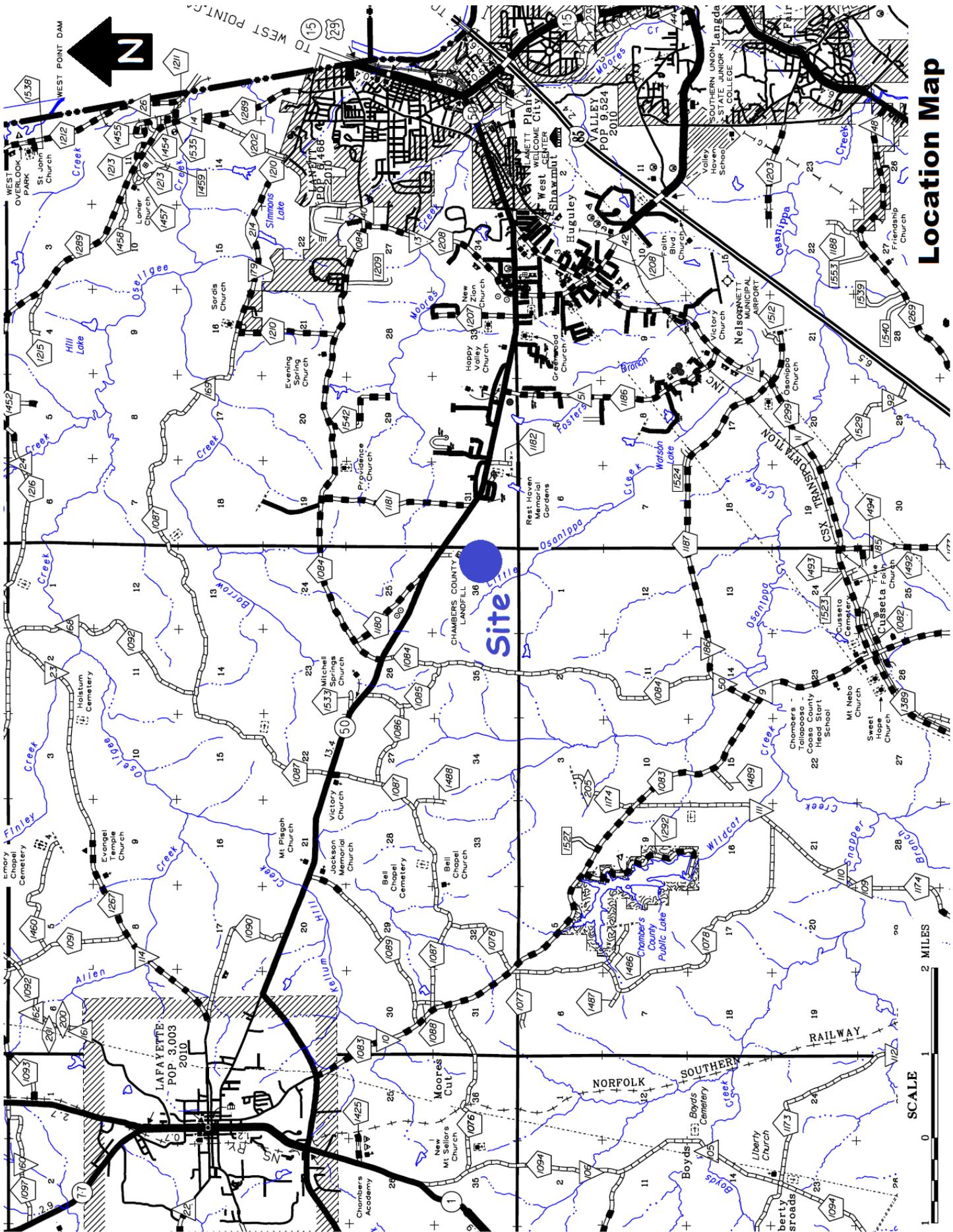
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Location Map

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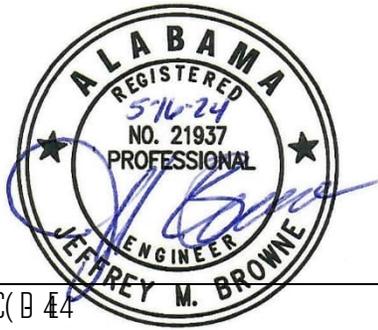
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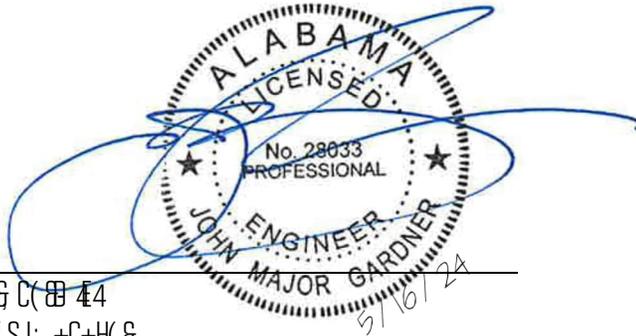
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 - C. **Limited Hydrogeologic Assessment** (*by Bunnell-Lammons Engineering, Inc.*)
 - D. **Phase I Cultural Resources Survey** (*by TerraXplorations, Inc.*)

This summary of Landfill Siting Standards was prepared for the existing Chambers County Landfill (Landfill) to demonstrate compliance with the requirements of the Alabama Department of Environmental Management (Department), Land Division – Solid Waste Program (Division 13) Administrative Code. In accordance with the current permit, the total permitted area for the Chambers County Landfill is approximately 50.5 acres, with approximately 19.6 acres currently permitted for disposal operations.

This summary addresses the permitted area which includes the existing landfill area and the proposed western disposal area which adds about 8.3 acres for a total disposal area of about 27.9 acres within the 50.5 acre permitted footprint. The administrative provisions of Section 4 (Permit Requirements), Subsection 1¹ are recited below in *italicized* font with the provisions of compliance at the Landfill immediately following in **Bold**.

Landfill Siting Standards
(ADEM Admin. Code r. 335-13-4-.01)

New or existing landfill units shall comply with the following standards in order to prevent adverse effects on health or the environment. As part of the application, the owner/operator must submit documentation addressing to the satisfaction of the Department the following siting standards.

(1) Location Standards.

- (a) A facility located in a floodplain shall not restrict the flow of the 100- year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste, so*

¹ ADEM Admin. Code r. 355-13-4-.01: Landfill Siting Standards

as to pose a hazard to human health and the environment.

The Landfill permitted area is not located within a 100-year floodplain. Refer to Attachment A which presents the site location within the 2011 FIRM mapping.

(b) *A facility shall be located in consideration of the following:*

1. *A facility shall not jeopardize the continued existence of endangered or threatened species protected under the Endangered Species Act of 1973.*

The Landfill permitted area (including disposal operations within it) will not affect federally protected, endangered or threatened species. Refer to the report prepared by Inver Environmental Consulting, LLC which is included as Attachment B.

2. *The facility shall not result in the destruction or adverse modification of critical habitats protected under the Endangered Species Act of 1973.*

The Landfill permitted area (including disposal operations within it) will not affect federally protected endangered or threatened species or their habitats. Refer to the report prepared by Inver Environmental Consulting, LLC included as Attachment B.

(c) *A MSWLF unit shall not be sited within 10,000 feet of any airport runway end. Owners or operators proposing to renew existing or site new MSWLF units located within a five-mile radius of any airport runway must notify the affected airport and the Federal Aviation Administration (FAA).*

Not applicable. The Landfill is an Industrial landfill that accepts construction and demolition waste and is not permitted to accept municipal solid waste or any putrescible waste.

(d) *Zones of active faults, seismic impact zones, and unstable areas shall be avoided in locating facilities and practices unless a site-specific evaluation as described below, demonstrates minimum potential for adverse effects upon waters of the State.*

1. *Site specific evaluations for geology and hydrology shall comply with 335-13-4-.11 through 335-13-4-.14.*

The Landfill permitted area is not located within a zone of active faults, seismic impact zones, or unstable areas. Refer to geologic borings included in Attachment C. Additionally, refer to the evaluation of slope stability included with the Petition for Variance which addresses the seismic stability of the existing and proposed disposal areas of the Landfill.

2. *Site specific evaluation shall include minimum design parameters necessary to protect the waters of the State and human health to include minimum requirements of 335-13-4-.15 through 335-13-4-.24.*

The Landfill design incorporates the following design features to protect the

waters of the State and human health:

- A minimum 5-foot separation between the base of the landfill and the seasonal high groundwater table. Refer to the geologic borings and groundwater potentiometric map included as Attachment C.
 - Final cover design grades, diversion berms at 20-foot spacings and a perimeter channel system to prevent sedimentation and siltation of downslope areas. Refer to
 - A sediment/storm water management pond designed to prevent the discharge of sediment from the property.
3. *Landfill units shall not be located within 200 feet of a fault that has had displacement within the Holocene epoch unless the owner or operator demonstrates to the Department that an alternative setback distance of less than 200 feet will not result in damage to the structural integrity of the facility and will be protective of human health and the environment.*

There are no active faults within 200 feet of the Landfill's permitted area. Refer to the geologic map included in Attachment C.

4. *Landfill units shall not be located in seismic impact zones, unless the owner or operator demonstrates to the Department that all containment structures, including liners, leachate collection systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.*

The Landfill's permitted area is not located in a seismic impact zone. Refer to the evaluation of slope stability included with the Petition for Variance which addresses the seismic stability of the Landfill permitted area.

5. *Landfill units shall not be located in an unstable area unless engineering measures have been incorporated in the design of the facility to ensure that the integrity of the structural components of the facility will not be disrupted. The following factors, at a minimum, must be considered when determining whether an area is unstable:*

The Landfill is not located in an unstable area. Refer to the evaluation of slope stability included with the Petition for Variance which addresses the site-specific soil and geologic conditions under both static and seismic conditions of the Landfill permit area.

- (i) *On-site or local soil and subsurface conditions that may result in significant differential settling;*

The Landfill is not located in an area with soil and subsurface conditions that could result in significant differential settling. Refer to the evaluation of slope stability included with the Petition for Variance which addresses the site-specific soil and geologic conditions under both static and seismic conditions of the Landfill permit area.

- (ii) *On-site or local geologic or geomorphologic features; and*

No local geologic or geomorphologic features within the Landfill expansion area is

anticipated to cause instability. Refer to the evaluation of slope stability included with the Petition for Variance which addresses the site-specific soil and geologic conditions under both static and seismic conditions of the Landfill permit area.

(iii) On-site or local human-made features or events (both surface and subsurface).

There are no known on-site or human-made features or events within the Landfill permit area that could cause instability.

(e) Landfill units shall not be located on a site that is archaeologically or historically sensitive as determined by the Alabama Historical Commission. Written certification must be provided from the State Historic Preservation Officer.

There are no known archaeologically or historically sensitive areas that have been identified within the Landfill permit area. Refer to the report prepared by TerraXplorations included in Attachment D.

(2) Water Quality Standards.

A facility shall be located so as to not adversely impact water quality by complying with the following:

(a) A facility shall not cause a discharge of pollutants into waters of the State, including wetlands, that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES), Alabama Water Pollution Control Act, Code of Alabama 1975, §§ 22-22-1 to 22-22-14 and/or section 404 of the Clean Water Act, as amended.

Refer to the report prepared by INVER included as Attachment B which delineates streams and wetlands within the Landfill's permitted area and selected, adjacent areas. No discharges from the Landfill permitted area (including disposal operations within it) will be in violation of the National Pollutant Discharge Elimination System (NPDES), Alabama Water Pollution Control Act, Code of Alabama 1975, §§ 22-22-1 to 22-22-14 and/or section 404 of the Clean Water Act, as amended.

(b) A facility shall not cause non-point source pollution of waters of the State, including wetlands, that violates any requirements of an area wide and statewide water quality management plan that has been approved under the Alabama Water Pollution Control Act.

Refer to the report prepared by INVER included as Attachment B which delineates streams and wetlands within the Landfill's permitted area and selected, adjacent areas. No non-point discharges from the Landfill permitted area (including disposal operations within it) will be in violation of any requirements of an area wide and statewide water quality management plan that has been approved under the Alabama Water Pollution Control Act.

(c) Landfill units including buffer zones shall not be permissible in wetlands, beaches or dunes.

Refer to the report prepared by INVER included as Attachment B which delineates streams and wetlands within the Landfill's permitted area and selected, adjacent areas. There will be no Landfill disposal areas within areas delineated as wetlands, as delineated in the INVER report. There are no beaches or dunes within the Landfill property.

- (d) *Landfill units shall not be permissible in any location where the disposal of solid waste would significantly degrade wetlands, beaches or dunes.*

Refer to the report prepared by INVER included as Attachment B which delineates streams and wetlands within the Landfill's permitted area and selected, adjacent areas. There will be no Landfill disposal areas within areas delineated as wetlands, as delineated in the INVER report. There are no beaches or dunes within the Landfill property.

- (e) *Landfill units shall be located outside the boundaries of the coastal area, unless no other reasonable alternative is available. If a site within the coastal area is proposed for development as a landfill unit, it shall be demonstrated to the satisfaction of the Department that siting, design, construction, and operation will ensure that present levels of coastal plants and animals will be maintained.*

Not applicable, the Landfill property is not located within the boundaries of the coastal area.

(3) Other Requirements

Solid Waste Disposal Facilities must comply with any other applicable State or Federal rules, laws, regulations or other requirements.

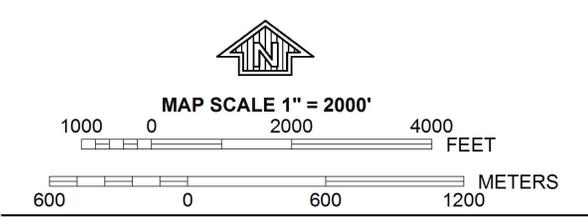
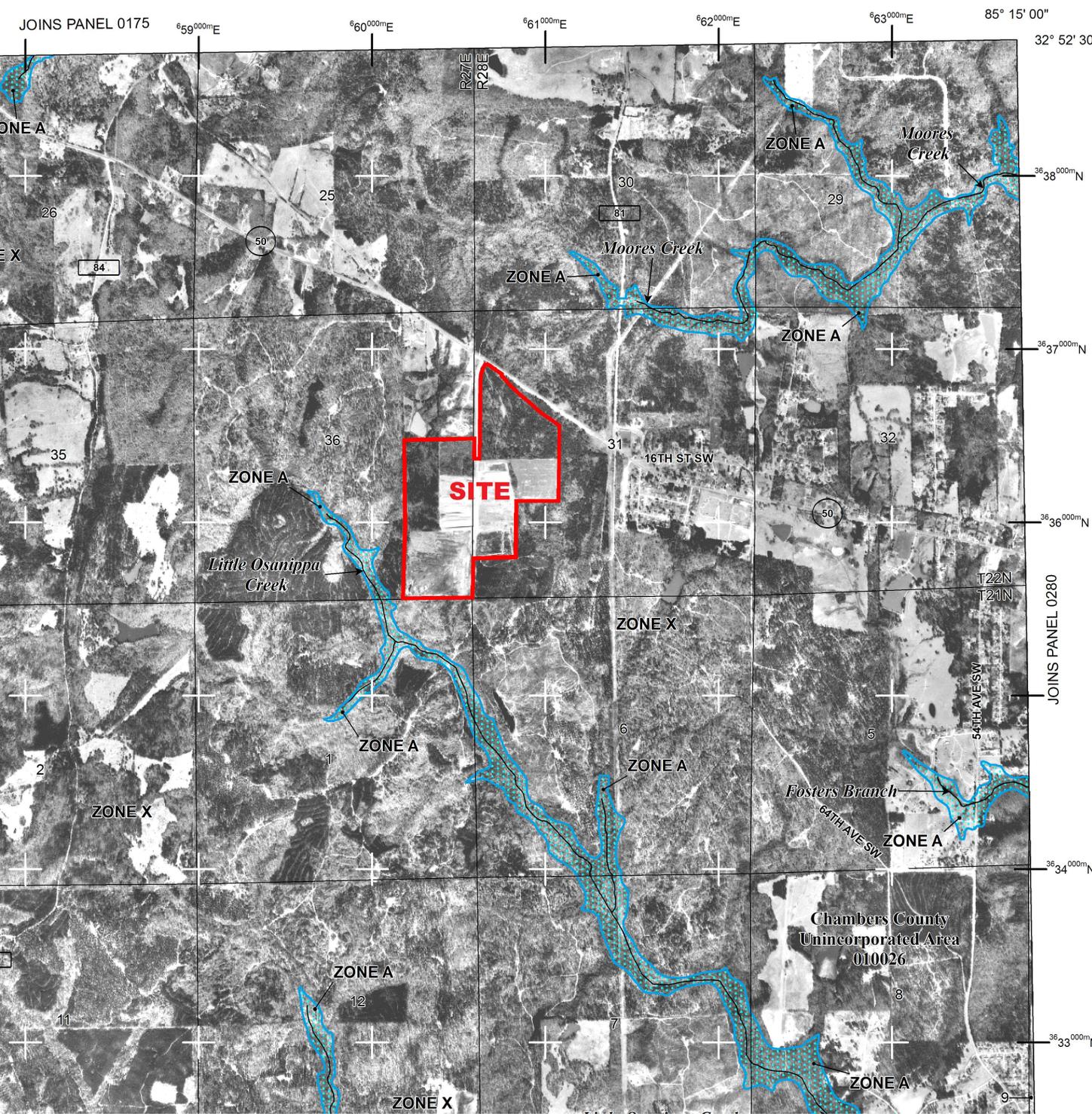
The Landfill complies with applicable State or Federal rules, laws, and regulations as well as local (Chambers County) requirements.

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Attachment A

FIRM Mapping

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NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0275C

FIRM
FLOOD INSURANCE RATE MAP
CHAMBERS COUNTY,
ALABAMA
AND INCORPORATED AREAS

PANEL 275 OF 425
 (SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|-----------------|--------|-------|--------|
| CHAMBERS COUNTY | 010026 | 0275 | C |

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

EFFECTIVE DATE **MAP NUMBER**
FEBRUARY 18, 2011 **01017C0275C**



State of Alabama
 Federal Emergency Management Agency

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Attachment B

**INVER Report - Waters of the US and
Endangered Species Act Site Review**

**Siting Standards
Chambers County Landfill
May 2024**

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Inver Environmental Consulting, LLC
102 W 3rd St, Suite 1000, Winston-Salem NC 27101

www.inverenv.com
(919) 606-1065

April 18, 2024

Mr. Jeff Browne, PE
Browne & Company, LLC
3312 Northside Dr. – D220
Macon, GA 31210

**RE: Waters of the US and Endangered Species Act Site Review
Chambers County Landfill
Chambers County AL**

Dear Mr. Browne;

As requested, Inver Environmental Consulting, LLC (Inver) has completed a review of the above referenced project for potential Waters of the US (WOTUS) regulated under the Clean Water Act and habitat for species protected under the Endangered Species Act (ESA) and listed by the US Fish and Wildlife Service (USFWS) as potentially occurring on the site. The review area comprises approximately 127 acres of the 182 acre property located south of Veterans Memorial Parkway west of Huguley, Alabama (**Figure 1**).

The purpose of this site review was to determine if proposed solid waste activities comply with ADEM Solid Waste Program rules related to water quality standards and protected species. Each pertinent rule is addressed in the appropriate section below.

Site Description

The site is located north of Little Osanippa Creek and has two unnamed tributaries shown on US Geological Survey (USGS) topographic mapping, draining generally from north to south on or in proximity of the site (**Figure 2**). The Natural Resources Conservation Service (NRCS) Chambers County Soil Survey shows three areas mapped as Sandy alluvial land, which are classified as Poorly Drained (**Figure 3**). The US Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping also shows the two USGS-mapped features on or near the review area (**Figure 4**).

The site is currently comprised of closed and operating landfill, along with associated borrow areas, and two forested areas in the northeast and west portions of the review area (**Figure 5**). The northeastern wooded area is comprised of gullied land with areas of small loblolly pine (*Pinus taeda*) and scrub vegetation. Other portions of the northwest wooded area have larger trees including red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), American holly (*Ilex opaca*), and red cedar (*Juniperus virginiana*) with an understory containing highbush blueberry (*Vaccinium corymbosum*), ground cedar (*Diphasiastrum digitatum*), muscadine grape (*Vitis rotundifolia*), and greenbrier (*Smilax rotundifolia*).

The forested western edge of the site is slightly more mature and includes loblolly pine, tulip poplar (*Liriodendron tulipifera*), ironwood (*Carpinus caroliniana*), sweetgum, water oak (*Quercus nigra*), hickory (*Cary sp.*), sourwood (*Oxydendrum arboretum*), and river birch (*Betula nigra*), with a limited understory

of muscadine grape, Japanese honeysuckle (*Lonicera japonica*), and yellow jessamine (*Gelsemium semipervirens*). Note understory layers are likely to contain additional plants since the field visit was early in the growing season.

Potential Waters of the US

The Review Area (**Figure 5**) was traversed on foot on March 16, 2023 to identify the presence, and limits, of potential WOTUS, including streams and wetlands. Identification and delineation of potential wetland resources was performed according to the methodologies described in the US Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual and 2012 Eastern Mountains and Piedmont Regional Supplement (Version 2.0). Potential streams were identified using Regulatory Guidance Letter 05-05 and the 2022 Interim National Ordinary High Water Mark Field Delineation Manual.

Four potential stream channels and four potential wetlands were found within the review area (**Figure 5**). Stream SA and wetland WA are located between closed landfill cells in the eastern portion of the site. Streams SB and SC and wetlands WB, WC, and WD are located in the western portion of the review area. Stream SD is located at the edge of the property in the northwest corner, just outside the review area.

The identified wetlands exhibited all three criteria (hydrology, vegetation, and soils) indicative of potential jurisdiction. Wetland delineation forms, and corresponding upland forms, are included in **Attachment 1** to document the characteristics found in these areas. Note that the forms for WD also represent WC as they are similar in nature and landscape position.

Streams exhibited characteristics of Ordinary High Water Mark (OHWM) including continuous bed and bank, alluvial substrate, and lack of vegetation. All potential streams exhibited flow during a relatively normal period of precipitation (**Attachment 2**). Stream SC may have been dug in uplands as a discharge from an upstream basin, but the lower end of the ditch, where stream characteristics begin to appear, is shown as potentially jurisdictional as a conservative measure.

The relevant DEM rules are provided below in *italics* with corresponding text responding to each item.

Siting Criteria regarding Water Quality Standards (Chapter 335-13-4-.01(2)):

(2) Water Quality Standards. A facility shall be located so as to not adversely impact water quality by complying with the following:

(a) A facility shall not cause a discharge of pollutants into waters of the State, including wetlands, that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES), Alabama Water Pollution Control Act, Code of Alabama 1975, §§ 22-22-1 to 22-22-14 and/or section 404 of the Clean Water Act, as amended.

Based on the limits of disturbance provided on April 4, 2024, the proposed landfill expansion would not result in a direct discharge into wetlands potentially subject to Section 404 of the Clean Water Act. Sediment and erosion control measures, addressed by others, meeting state standards would address unforeseen discharges into the wetlands.

(b) A facility shall not cause non-point source pollution of waters of the State, including wetlands, that violates any requirements of an area wide and statewide water quality management plan that has been approved under the Alabama Water Pollution Control Act.

Little Osanippa Creek and its tributaries are not listed by ADEM as having a water quality management plan. Osanippa Creek downstream is listed as a Water Supply Watershed. Sediment and erosion control measures meeting state standards would ensure compliance with water quality standards.

(c) Landfill units including buffer zones shall not be permissible in wetlands, beaches or dunes.

Landfill units will not be located within buffer zones of wetlands identified above. No beaches or dunes are present on the site.

(d) Landfill units shall not be permissible in any location where the disposal of solid waste would significantly degrade wetlands, beaches or dunes.

Solid waste disposal will be contained within the proposed landfill meeting ADEM requirements, and degradation of nearby wetlands is not anticipated. Proposed buffers of approximately 25 to over 120 linear feet between the limits of disturbance and identified wetland boundaries further protect these resources.

(e) Landfill units shall be located outside the boundaries of the coastal area, unless no other reasonable alternative is available. If a site within the coastal area is proposed for development as a landfill unit, it shall be demonstrated to the satisfaction of the Department that siting, design, construction, and operation will ensure that present levels of coastal plants and animals will be maintained.

Chambers County is not within the ADEM Coastal Area Management Program Coastal Area Boundary.

Endangered Species Act

The ESA requires federal agencies to coordinate with the USFWS on the potential for a federal action (i.e. permit, funding, or use of federal property) to affect species protected by the rule. **Table 1** provides a list of species potentially occurring on the site based on the USFWS Information for Planning and Consultation (IPaC) (April 9, 2024), along with their federal status, presence of habitat, and (if required) a Biological Conclusion regarding the potential for the proposed project to affect the species. The USFWS IPaC report for the site is provided in **Attachment 3**. Note that this is a draft IPaC report as consultation with USFWS is not required at this time.

Table 1: USFWS IPaC Species List (04/09/24)

| Scientific Name | Common Name | Federal Status* | Habitat Present | Biological Conclusion |
|-------------------------------|---------------------------|-----------------|-----------------|-----------------------|
| <i>Myotis septentrionalis</i> | Northern long-eared bat | E | Yes | N/A |
| <i>Perimyotis subflavus</i> | Tricolored bat | PE | Yes | N/A |
| <i>Grus americana</i> | Whooping crane | EXPN | No | N/A |
| <i>Macrochelys temminckii</i> | Alligator snapping turtle | PT | No | No Effect |
| <i>Danaus Plexippus</i> | Monarch butterfly | C | No | N/A |

*E = Endangered; PE = Proposed Endangered; PT = Proposed Threatened; C = Candidate; EXPN = Experimental Population, Non-essential

“Proposed” species (either endangered or threatened) requires federal agencies to confer with the USFWS if the action will jeopardize the continued existence of the proposed species.

Northern long-eared bat: Potential summer habitat (forested areas) is present on the site. The USFWS IPaC report states that this species only needs to be considered if the project includes wind turbine operations. Since this is not applicable to the proposed project, no biological conclusion is proposed.

Tricolored bat: Potential summer habitat (forested areas) is present on the site. The USFWS IPaC report states that this species only needs to be considered if the project includes wind turbine operations. Since this is not applicable to the proposed project, no biological conclusion is proposed.

Whooping Crane: Experimental Population species do not require federal agency consultation with USFWS unless on a National Park or National Wildlife Refuge. Federal agencies are required to confer with USFWS only if the action will jeopardize the continued existence of the species. Since no whooping crane habitat, shallow marshes and adjacent open grasslands, is present on the site no biological conclusion is proposed.

Alligator snapping turtle: No habitat is present on the site for this species, which inhabits deeper waters including sloughs, lakes, swamps and rivers. The streams on or adjacent to the site are small headwater features without adequate depth. The project will have No Effect on this species.

Monarch butterfly: Candidate species have no requirements for consultation under the ESA.

ADEM Rules (335-13-4-.01(1)(b))

(b) A facility shall be located in consideration of the following:

- 1. A facility shall not jeopardize the continued existence of endangered or threatened species protected under the Endangered Species Act of 1973.*

Based on the results of the IPaC screening for the site boundary (**Attachment 3**), and the assessments described above, the facility will not jeopardize the continued existence of an ESA listed species.

- 2. The facility shall not result in the destruction or adverse modification of critical habitats protected under the Endangered Species Act of 1973.*

As documented in the attached IPaC report (**Attachment 3**), no critical habitat for ESA listed species is present in or adjacent to the project.

Conclusion

Based on the site review and assessments described above, it is our professional opinion that the project will not affect potential WOTUS resources or federally protected endangered/threatened species. No documentation is required from the USACE if impacts to WOTUS are not proposed, however a request for a jurisdictional determination can be submitted if requested to confirm the delineation results. As noted above, the delineation includes conservative identification of potential WOTUS where questionable, such as stream SC, and changes as a result of USACE verification are unlikely to increase the size of identified features. Informal coordination with USFWS, to confirm no effects on the listed species in **Table 1**, is recommended if a federal action is associated with the project.

If you have any questions or require additional information please contact me at your earliest convenience at philm@inverenv.com or 919-606-1065.

Sincerely,

Inver Environmental Consulting, LLC

DocuSigned by:

Philip May
EA265839ADE54E4...

Senior Consultant

Cc: John Gardner, PE, Smith Gardner, Inc.
Nathan Dunn, Amwaste USA

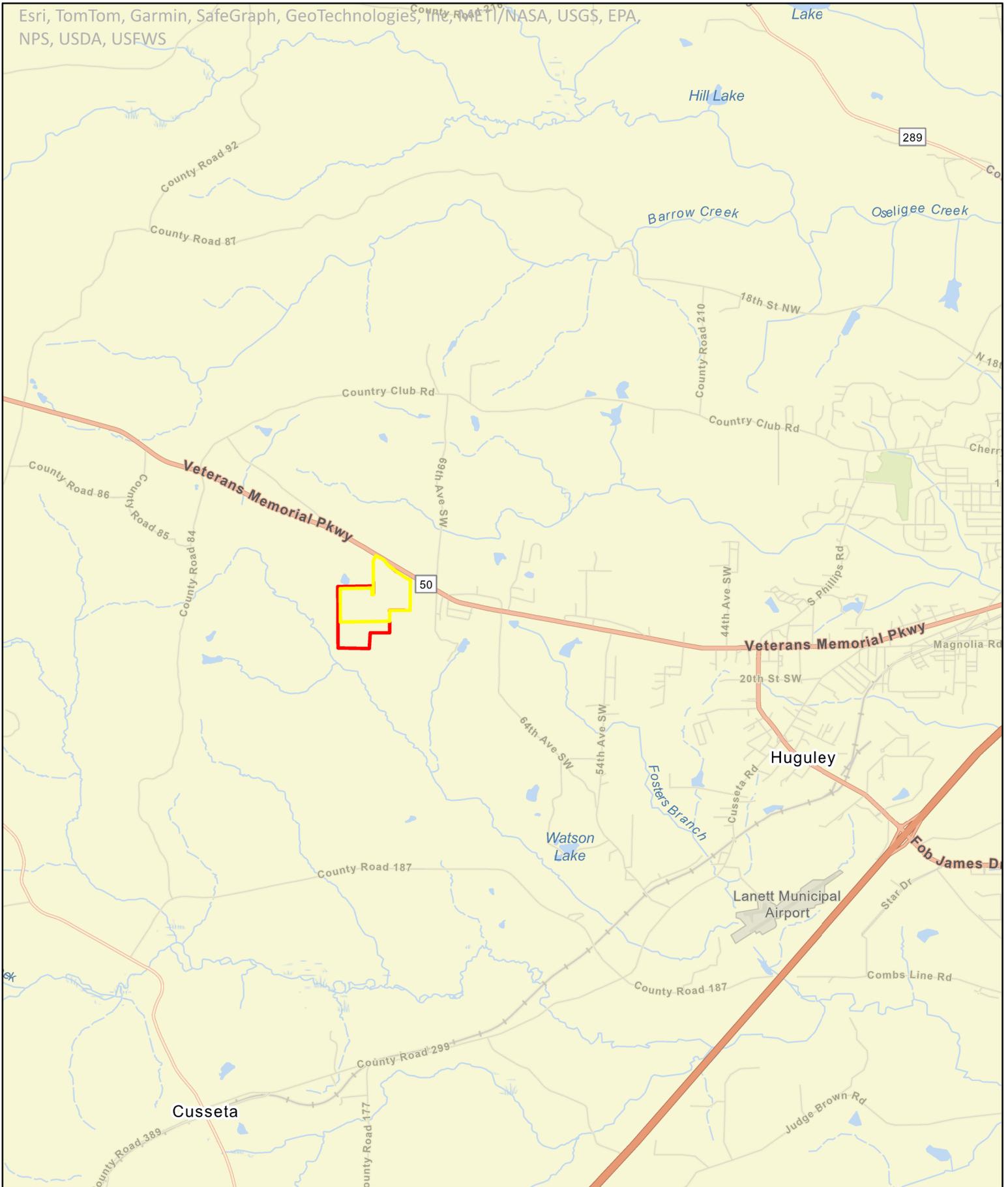
Figures

- Figure 1: Vicinity Map
- Figure 2: USGS National Map
- Figure 3: NRCS Soils Map
- Figure 4: USFWS National Wetland Inventory
- Figure 5: Potential Aquatic Resources

Attachments

- Attachment 1: Wetland/Upland Data Forms
- Attachment 2: USACE Antecedent Precipitation Tool Report
- Attachment 3: USFWS IPaC Report (Not for consultation)

FIGURES



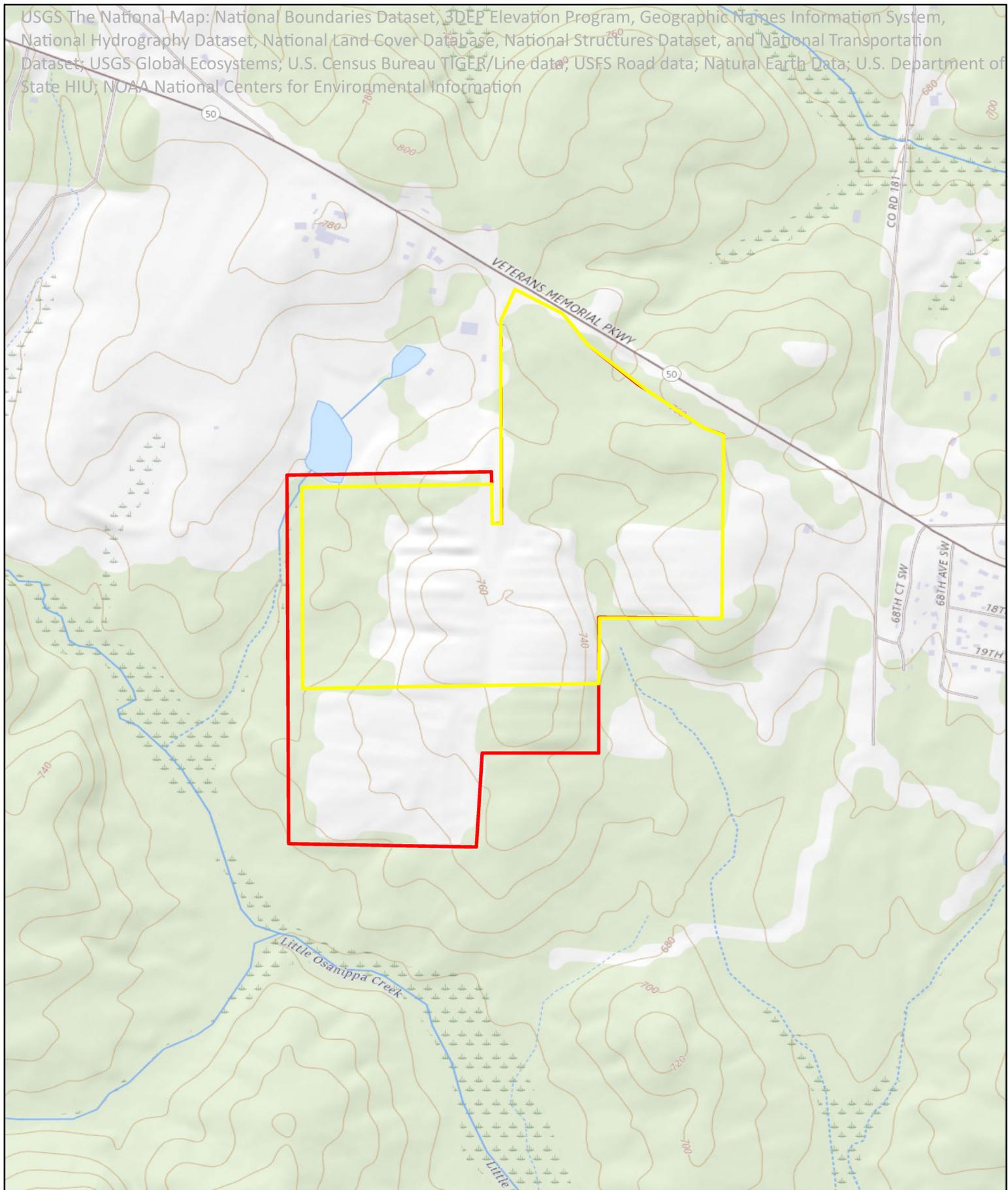
0 3,000 6,000
Feet

- Review Area
- Site Boundary

Figure 1
Vicinity Map
Chambers Co Landfill
Chambers Co AL

03/01/24

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State HIU; NOAA National Centers for Environmental Information



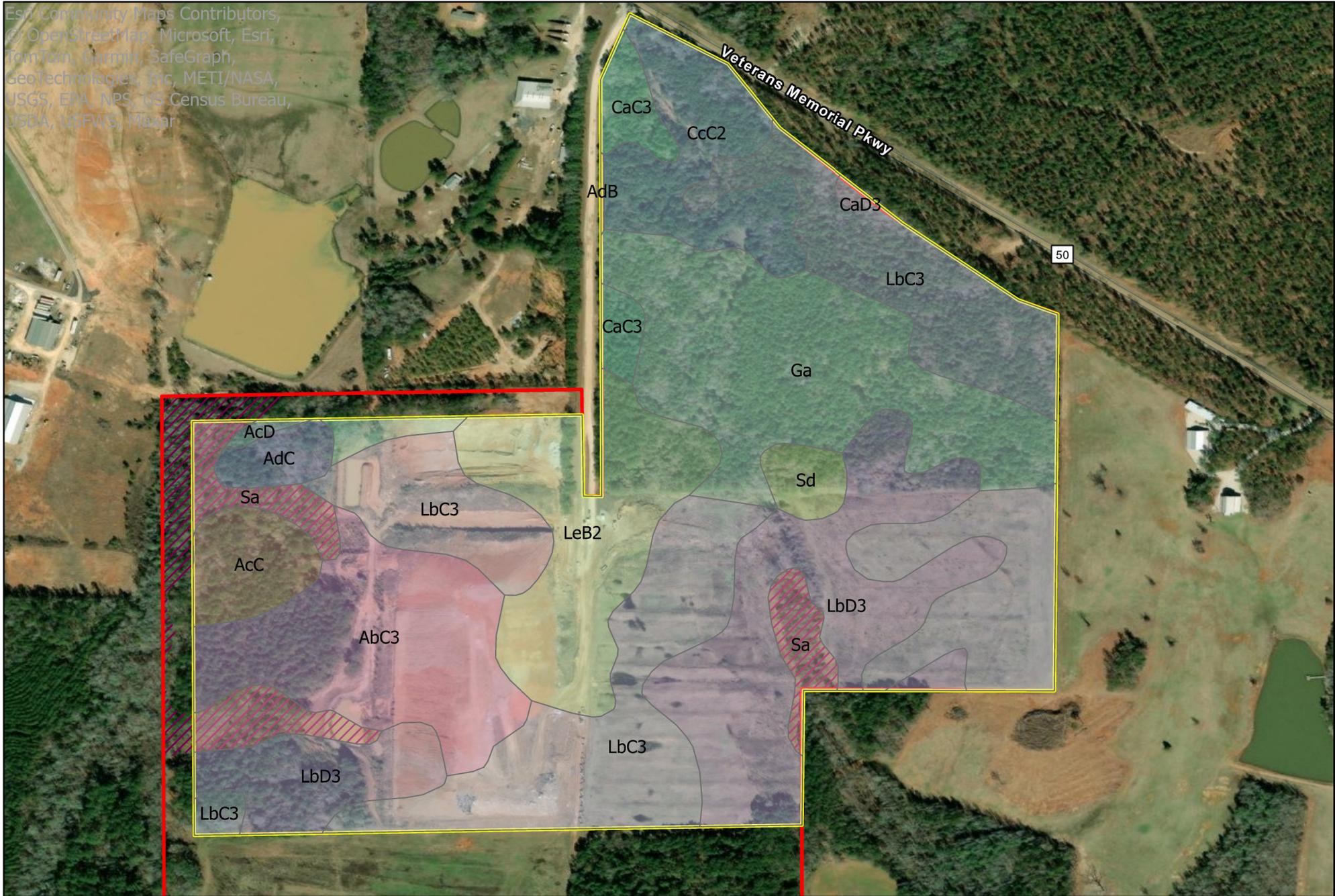
Review Area
Site Boundary

0 600 1,200 Feet

Figure 2
USGS National Map
Chambers Co Landfill
Chambers Co AL

03/01/24

Esri Community Maps Contributors,
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TomTom, Garmin, SafeGraph,
GeoTechnologies, Inc, METI/NASA,
USGS, EPA, NPS, US Census Bureau,
USDA, USFWS, Maxar



03/01/24

- Review Area
- Site Boundary
- Poorly Drained Soils

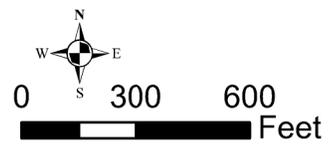
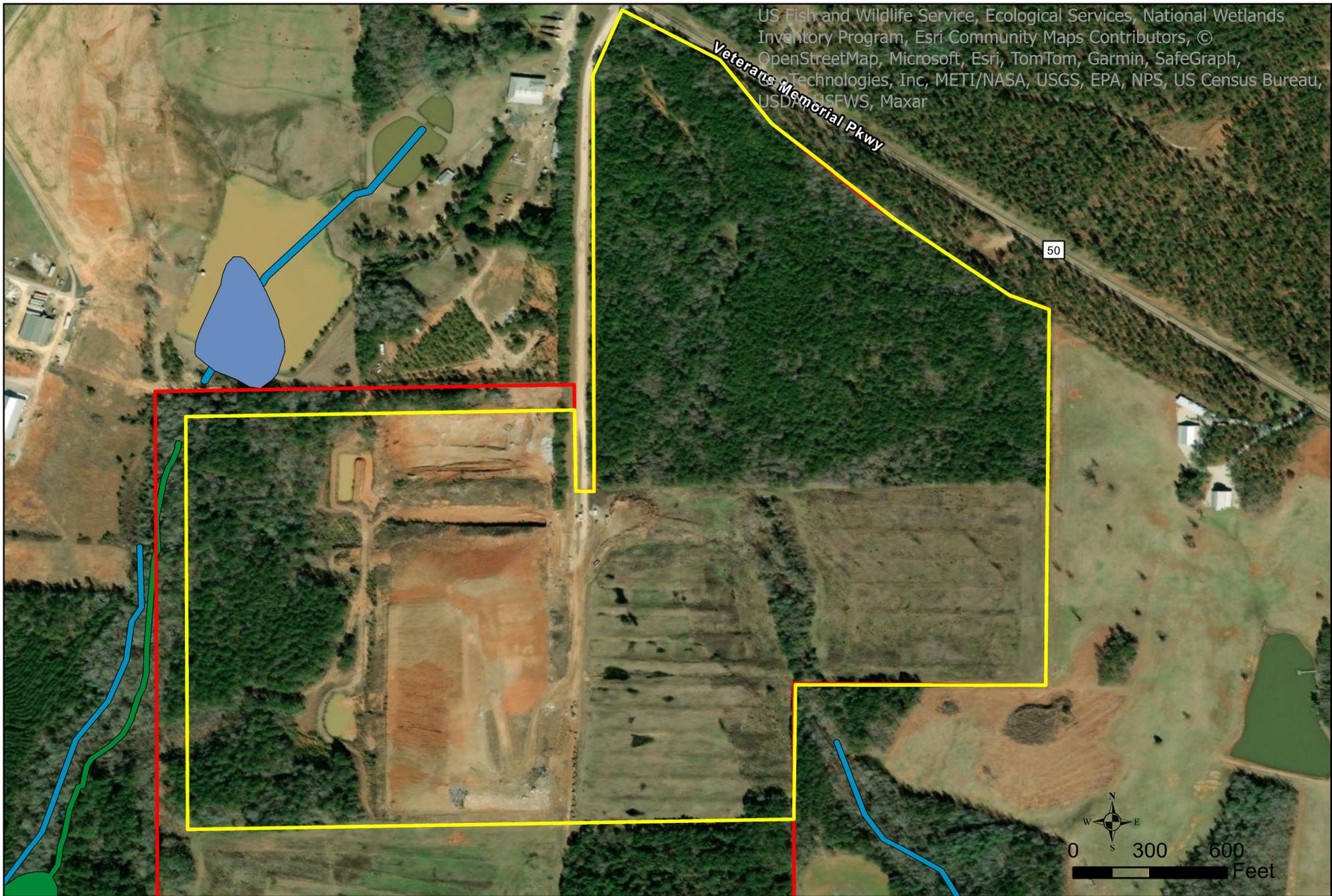


Figure 3
NRCS Soils Map
Chambers Co Landfill
Chambers Co AL

US Fish and Wildlife Service, Ecological Services, National Wetlands Inventory Program, Esri Community Maps Contributors, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, Mapbox, Technologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Maxar



03/01/24

 Review Area
 Site Boundary

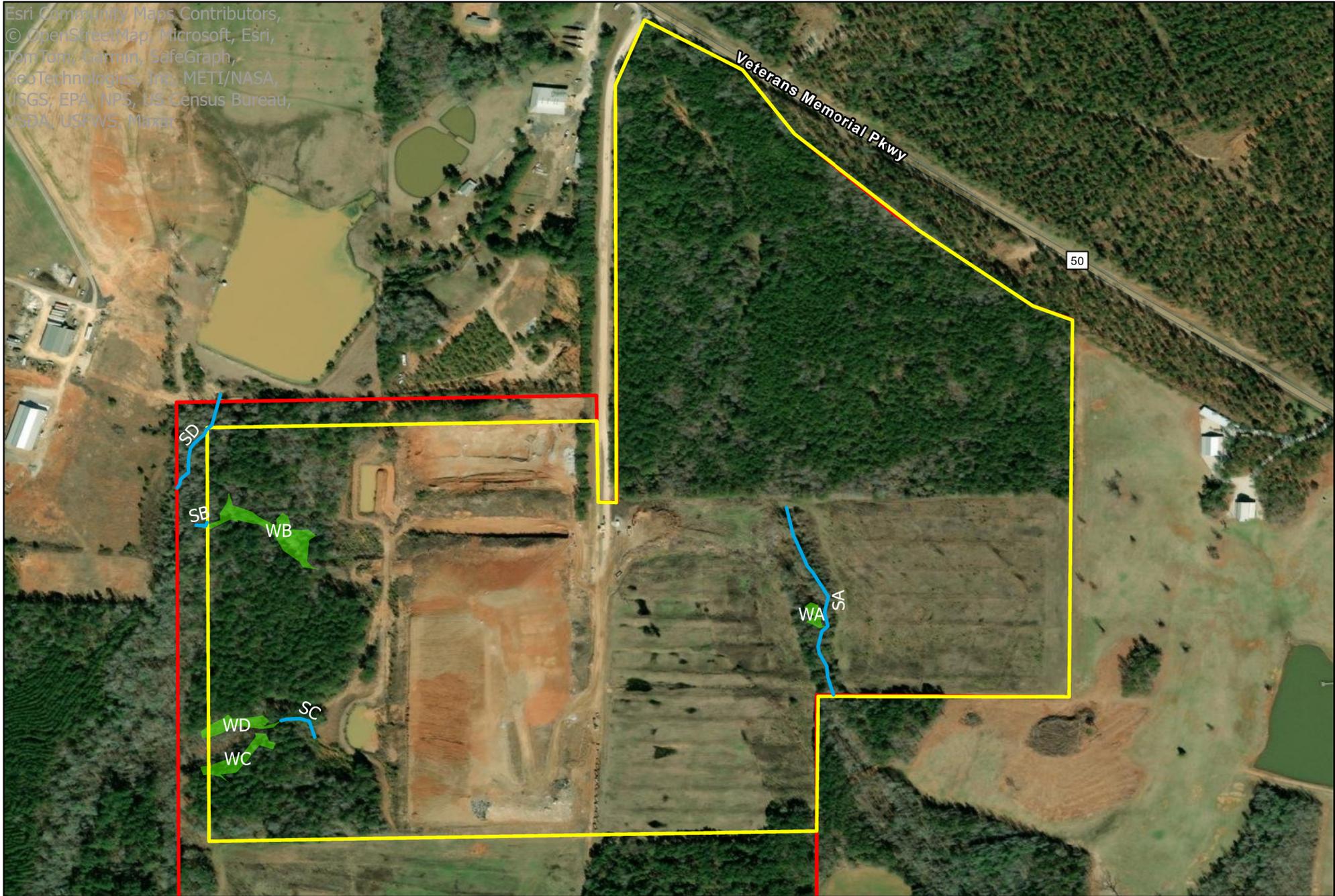
 Estuarine and Marine Deepwater
 Estuarine and Marine Wetland

 Freshwater Emergent Wetland
 Freshwater Forested/Shrub Wetland
 Freshwater Pond

 Lake
 Other
 Riverine

Figure 4
National Wetland Inventory
Chambers Co Landfill
Chambers Co AL

Esri Community Maps Contributors,
© OpenStreetMap, Microsoft, Esri,
TomTom, Garmin, SafeGraph,
GeoTechnologies, Inc. METI/NASA,
USGS, EPA, NPS, US Census Bureau,
USDA, USFWS, Maxar



03/01/24

- Stream
- Review Area
- Wetland

Site Boundary

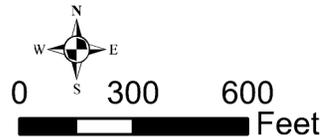


Figure 5
Potential Aquatic Resources
Chambers Co Landfill
Chambers Co AL

ATTACHMENT 1
WETLAND/UPLAND DATA FORMS

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Chambers Co Landfill City/County: Chambers County Sampling Date: 2023-03-16
 Applicant/Owner: _____ State: Alabama Sampling Point: WAup
 Investigator(s): Phil May Section, Township, Range: sec 31 T022N R028E
 Landform (hillslope, terrace, etc.): Other Local relief (concave, convex, none): None Slope (%): 0-2
 Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 32.8521480 Long: -85.2814951 Datum: WGS84
 Soil Map Unit Name: Sandy alluvial land, poorly to somewhat poorly drained NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|---|
| Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
|--|---|

Remarks:
Data point just outside wetland boundary - FAC/FACW vegetation on wetland side.

HYDROLOGY

| | |
|---|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13) | <u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5) |
|---|--|

| | |
|---|--|
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe) | Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> |
|---|--|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology indicators except geomorphic position

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WAup

| | Absolute % Cover | Dominant Species? | Indicator Status | | | | | |
|---|--|----------------------|--|---|--|--|-----------|--|
| Tree Stratum (Plot size: <u>30</u>) | | | | | | | | |
| 1. <i>Platanus occidentalis</i> | 40 | Y | FACW | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.00</u> (A/B) | | | | |
| 2. <i>Acer rubrum</i> | 30 | Y | FAC | | | | | |
| 3. _____ | | | | | | | | |
| 4. _____ | | | | | | | | |
| 5. _____ | | | | | | | | |
| 6. _____ | | | | | | | | |
| 7. _____ | | | | | | | | |
| <u>70.0</u> = Total Cover | | | | | | | | |
| 50% of total cover: <u>35.0</u> 20% of total cover: <u>14.0</u> | | | | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15</u>) | | | | | | | | |
| 1. <i>Ligustrum sinense</i> | 20 | Y | FACU | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>0.00</u> x 1 = <u>0.00</u> FACW species <u>0.00</u> x 2 = <u>0.00</u> FAC species <u>0.00</u> x 3 = <u>0.00</u> FACU species <u>0.00</u> x 4 = <u>0.00</u> UPL species <u>0.00</u> x 5 = <u>0.00</u> Column Totals: <u>0.00</u> (A) <u>0.00</u> (B) Prevalence Index = B/A = _____ | | | | |
| 2. _____ | | | | | | | | |
| 3. _____ | | | | | | | | |
| 4. _____ | | | | | | | | |
| 5. _____ | | | | | | | | |
| 6. _____ | | | | | | | | |
| 7. _____ | | | | | | | | |
| 8. _____ | | | | | | | | |
| 9. _____ | | | | | | | | |
| <u>20.0</u> = Total Cover | | | | | | | | |
| 50% of total cover: <u>10.0</u> 20% of total cover: <u>4.0</u> | | | | | | | | |
| Herb Stratum (Plot size: <u>5</u>) | | | | | | | | |
| 1. <i>Arundinaria gigantea</i> | 80 | Y | FACW | Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | |
| 2. <i>Woodwardia areolata</i> | 10 | N | FACW | | | | | |
| 3. _____ | | | | | | | | |
| 4. _____ | | | | | | | | |
| 5. _____ | | | | | | | | |
| 6. _____ | | | | | | | | |
| 7. _____ | | | | | | | | |
| 8. _____ | | | | | | | | |
| 9. _____ | | | | | | | | |
| 10. _____ | | | | | | | | |
| 11. _____ | | | | | | | | |
| <u>90.0</u> = Total Cover | | | | | | | | |
| 50% of total cover: <u>45.0</u> 20% of total cover: <u>18.0</u> | | | | | | | | |
| Woody Vine Stratum (Plot size: <u>30</u>) | | | | | | | | |
| 1. <i>Lonicera japonica</i> | 20 | Y | FACU | Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. | | | | |
| 2. <i>Smilax rotundifolia</i> | 10 | Y | FAC | | | | | |
| 3. _____ | | | | | | | | |
| 4. _____ | | | | | | | | |
| 5. _____ | | | | | | | | |
| <u>30.0</u> = Total Cover | | | | | | | | |
| 50% of total cover: <u>15.0</u> 20% of total cover: <u>6.0</u> | | | | | | | | |
| <table style="width:100%; border:none;"> <tr> <td style="width:60%;"></td> <td style="width:10%;">Hydrophytic Vegetation Present?</td> <td style="width:10%;">Yes _____</td> <td style="width:20%;">No <input checked="" type="checkbox"/></td> </tr> </table> | | | | | | Hydrophytic Vegetation Present? | Yes _____ | No <input checked="" type="checkbox"/> |
| | Hydrophytic Vegetation Present? | Yes _____ | No <input checked="" type="checkbox"/> | | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) | | | | | | | | |

SOIL

Sampling Point: WAup

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-2 | 7.5YR | 3/4 | 100 | | | | Loam | |
| 2-12 | 5YR | 4/6 | 100 | | | | SCL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators: | | Indicators for Problematic Hydric Soils³: | |
|--|--|---|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) | |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | <input type="checkbox"/> Coast Prairie Redox (A16) | |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | <input type="checkbox"/> (MLRA 147, 148) | |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) | |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> (MLRA 136, 147) | |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Other (Explain in Remarks) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) | | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| | |
|---|---|
| Restrictive Layer (if observed): Type: _____ Depth (inches): _____ | Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> |
|---|---|

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Chambers Co Landfill City/County: Chambers County Sampling Date: 2023-03-16
 Applicant/Owner: _____ State: Alabama Sampling Point: WAwet
 Investigator(s): Phil May Section, Township, Range: sec 31 T022N R028E
 Landform (hillslope, terrace, etc.): Other Local relief (concave, convex, none): _____ Slope (%): 0-2
 Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 32.852250 Long: -85.281407 Datum: WGS84
 Soil Map Unit Name: Sandy alluvial land, poorly to somewhat poorly drained NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: | |

HYDROLOGY

| | |
|--|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Water Marks (B1) _____ Presence of Reduced Iron (C4) _____ Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) _____ Iron Deposits (B5) _____ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) _____ Aquatic Fauna (B13) | <u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
|--|--|

| | |
|--|---|
| Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>3</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe) | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
|--|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WAwet

| | Absolute % Cover | Dominant Species? | Indicator Status | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------|----------------------|---------------------|---|--|-------------|--------------|-------------|-------------|-------------|-------|-------------|--------------|--------------|-------|---------------|-------------|---------------|-------|---------------|--------------|--------------|-------|--------------|-------------|-------------|-------|-------------|----------------|-------------------|--|-------------------|
| Tree Stratum (Plot size: <u>30</u>) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. <i>Cartrema americana</i> | 50 | Y | FAC | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83.33</u> (A/B) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. <i>Liquidambar styraciflua</i> | 20 | Y | FAC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{70.0}{100} = \text{Total Cover}$ 50% of total cover: <u>35.0</u> 20% of total cover: <u>14.0</u> | | | | Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="text-align:right;">Total % Cover of:</td> <td style="text-align:center;"><u>0.00</u></td> <td style="text-align:right;">Multiply by:</td> <td style="text-align:center;"><u>0.00</u></td> </tr> <tr> <td>OBL species</td> <td style="text-align:center;"><u>0.00</u></td> <td>x 1 =</td> <td style="text-align:center;"><u>0.00</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center;"><u>90.00</u></td> <td>x 2 =</td> <td style="text-align:center;"><u>180.00</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center;"><u>100.00</u></td> <td>x 3 =</td> <td style="text-align:center;"><u>300.00</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center;"><u>10.00</u></td> <td>x 4 =</td> <td style="text-align:center;"><u>40.00</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center;"><u>0.00</u></td> <td>x 5 =</td> <td style="text-align:center;"><u>0.00</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center;"><u>200.00</u> (A)</td> <td></td> <td style="text-align:center;"><u>520.00</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.6</u> | Total % Cover of: | <u>0.00</u> | Multiply by: | <u>0.00</u> | OBL species | <u>0.00</u> | x 1 = | <u>0.00</u> | FACW species | <u>90.00</u> | x 2 = | <u>180.00</u> | FAC species | <u>100.00</u> | x 3 = | <u>300.00</u> | FACU species | <u>10.00</u> | x 4 = | <u>40.00</u> | UPL species | <u>0.00</u> | x 5 = | <u>0.00</u> | Column Totals: | <u>200.00</u> (A) | | <u>520.00</u> (B) |
| Total % Cover of: | <u>0.00</u> | Multiply by: | <u>0.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OBL species | <u>0.00</u> | x 1 = | <u>0.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FACW species | <u>90.00</u> | x 2 = | <u>180.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FAC species | <u>100.00</u> | x 3 = | <u>300.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FACU species | <u>10.00</u> | x 4 = | <u>40.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UPL species | <u>0.00</u> | x 5 = | <u>0.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Column Totals: | <u>200.00</u> (A) | | <u>520.00</u> (B) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15</u>) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. <i>Liquidambar styraciflua</i> | 30 | Y | FAC | | Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is $\leq 3.0^1$ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. <i>Ligustrum sinense</i> | 10 | Y | FACU | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{40.0}{100} = \text{Total Cover}$ 50% of total cover: <u>20.0</u> 20% of total cover: <u>8.0</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Herb Stratum (Plot size: <u>5</u>) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. <i>Arundinaria gigantea</i> | 70 | Y | FACW | Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. <i>Woodwardia areolata</i> | 20 | Y | FACW | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{90.0}{100} = \text{Total Cover}$ 50% of total cover: <u>45.0</u> 20% of total cover: <u>18.0</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Woody Vine Stratum (Plot size: <u>30</u>) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. _____ | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{0}{100} = \text{Total Cover}$ 50% of total cover: <u>0.0</u> 20% of total cover: <u>0.0</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WAwet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-9 | 10YR 3/1 | 80 | 10YR 3/6 | 20 | C | M/PL | CL | |
| 9-12 | 10YR 3/2 | 90 | 10YR 3/6 | 10 | C | M | CL | |
| | | | | | | | | |
| | | | | | | | | |
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| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| | | |
|--|--|---|
| Hydric Soil Indicators: | | Indicators for Problematic Hydric Soils³: |
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | <input type="checkbox"/> Coast Prairie Redox (A16) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | (MLRA 147, 148) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Depleted Matrix (F3) | (MLRA 136, 147) |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input checked="" type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| | |
|---|--|
| Restrictive Layer (if observed): Type: _____ Depth (inches): _____ | Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ |
|---|--|

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Chambers Co Landfill City/County: Chambers County Sampling Date: 2023-03-16
 Applicant/Owner: _____ State: Alabama Sampling Point: WBup
 Investigator(s): Phil May Section, Township, Range: sec 36 T022N R027E
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): None Slope (%): 3-7
 Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 32.853119 Long: -85.287271 Datum: WGS84
 Soil Map Unit Name: Appling gravelly sandy loam, sloping NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
| Remarks: | |

HYDROLOGY

| | |
|---|--|
| <p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13) | <p><u>Secondary Indicators (minimum of two required)</u></p> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5) |
| <p>Field Observations:</p> Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe) | <p>Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/></p> |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WBup

| | Absolute % Cover | Dominant Species? | Indicator Status | | |
|---|---------------------|----------------------|---------------------|--|--|
| Tree Stratum (Plot size: <u>30</u>) | | | | | |
| 1. <u><i>Pinus taeda</i></u> | <u>40</u> | <u>Y</u> | <u>FAC</u> | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.00</u> (A/B) | |
| 2. <u><i>Liriodendron tulipifera</i></u> | <u>20</u> | <u>Y</u> | <u>FACU</u> | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| $\frac{60.0}{100} = \text{Total Cover}$ 50% of total cover: <u>30.0</u> 20% of total cover: <u>12.0</u> | | | | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>0.00</u> x 1 = <u>0.00</u> FACW species <u>0.00</u> x 2 = <u>0.00</u> FAC species <u>0.00</u> x 3 = <u>0.00</u> FACU species <u>0.00</u> x 4 = <u>0.00</u> UPL species <u>0.00</u> x 5 = <u>0.00</u> Column Totals: <u>0.00</u> (A) <u>0.00</u> (B) Prevalence Index = B/A = _____ | |
| Sapling/Shrub Stratum (Plot size: <u>15</u>) | | | | | |
| 1. <u><i>Carpinus caroliniana</i></u> | <u>40</u> | <u>Y</u> | <u>FAC</u> | | |
| 2. <u><i>Liquidambar styraciflua</i></u> | <u>20</u> | <u>Y</u> | <u>FAC</u> | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| $\frac{60.0}{100} = \text{Total Cover}$ 50% of total cover: <u>30.0</u> 20% of total cover: <u>12.0</u> | | | | | |
| Herb Stratum (Plot size: <u>5</u>) | | | | | |
| 1. _____ | | | | | |
| 2. _____ | | | | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| 11. _____ | | | | | |
| $\frac{0}{100} = \text{Total Cover}$ 50% of total cover: <u>0.0</u> 20% of total cover: <u>0.0</u> | | | | Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is $\leq 3.0^1$ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) | |
| $\frac{0}{100} = \text{Total Cover}$ 50% of total cover: <u>0.0</u> 20% of total cover: <u>0.0</u> | | | | | |
| Woody Vine Stratum (Plot size: <u>30</u>) | | | | | |
| 1. <u><i>Lonicera japonica</i></u> | <u>20</u> | <u>Y</u> | <u>FACU</u> | | Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. |
| 2. <u><i>Vitis rotundifolia</i></u> | <u>10</u> | <u>Y</u> | <u>FAC</u> | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| $\frac{30.0}{100} = \text{Total Cover}$ 50% of total cover: <u>15.0</u> 20% of total cover: <u>6.0</u> | | | | | |
| $\frac{30.0}{100} = \text{Total Cover}$ 50% of total cover: <u>15.0</u> 20% of total cover: <u>6.0</u> | | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) No herb layer - early in growing season | | | | Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> | |
| | | | | | |

SOIL

Sampling Point: WBup

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-2 | 10YR | 3/3 | 100 | | | | L | |
| 2-9 | 2.5Y | 4/4 | 100 | | | | CSL | |
| 9-15 | 10YR | 5/6 | 100 | | | | L | |
| | | | | | | | | |
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| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| | | | |
|---|---|--|--|
| Hydric Soil Indicators: | | Indicators for Problematic Hydric Soils³: | |
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) | |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | <input type="checkbox"/> Coast Prairie Redox (A16) | |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | <input type="checkbox"/> (MLRA 147, 148) | |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) | |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> (MLRA 136, 147) | |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Other (Explain in Remarks) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) | | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| | |
|---|---|
| Restrictive Layer (if observed): Type: _____ Depth (inches): _____ | Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> |
|---|---|

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Chambers Co Landfill City/County: Chambers County Sampling Date: 2023-03-16
 Applicant/Owner: _____ State: Alabama Sampling Point: WBwet
 Investigator(s): Phil May Section, Township, Range: sec 36 T022N R027E
 Landform (hillslope, terrace, etc.): Other Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 32.853158 Long: -85.287157 Datum: WGS84
 Soil Map Unit Name: Appling gravelly sandy loam, sloping NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: | |

HYDROLOGY

| | |
|---|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) <input checked="" type="checkbox"/> Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) <input checked="" type="checkbox"/> Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13) | <u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input checked="" type="checkbox"/> Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
|---|--|

| | |
|---|--|
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe) | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
|---|--|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WBwet

| | Absolute % Cover | Dominant Species? | Indicator Status | |
|---|------------------|-------------------|------------------|---|
| Tree Stratum (Plot size: <u>30</u>) | | | | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>71.43</u> (A/B) |
| 1. <u>Quercus nigra</u> | <u>40</u> | <u>Y</u> | <u>FAC</u> | |
| 2. <u>Liquidambar styraciflua</u> | <u>30</u> | <u>Y</u> | <u>FAC</u> | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| <u>70.0</u> = Total Cover 50% of total cover: <u>35.0</u> 20% of total cover: <u>14.0</u> | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15</u>) | | | | |
| 1. <u>Carpinus caroliniana</u> | <u>30</u> | <u>Y</u> | <u>FAC</u> | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>0.00</u> x 1 = <u>0.00</u> FACW species <u>20.00</u> x 2 = <u>40.00</u> FAC species <u>120.00</u> x 3 = <u>360.00</u> FACU species <u>40.00</u> x 4 = <u>160.00</u> UPL species <u>0.00</u> x 5 = <u>0.00</u> Column Totals: <u>180.00</u> (A) <u>560.00</u> (B) Prevalence Index = B/A = <u>3.11</u> |
| 2. <u>Hamamelis virginiana</u> | <u>20</u> | <u>Y</u> | <u>FACU</u> | |
| 3. <u>Ligustrum sinense</u> | <u>10</u> | <u>N</u> | <u>FACU</u> | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| <u>60.0</u> = Total Cover 50% of total cover: <u>30.0</u> 20% of total cover: <u>12.0</u> | | | | |
| Herb Stratum (Plot size: <u>5</u>) | | | | |
| 1. <u>Arundinaria gigantea</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> | Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 2. _____ | _____ | _____ | _____ | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| <u>20.0</u> = Total Cover 50% of total cover: <u>10.0</u> 20% of total cover: <u>4.0</u> | | | | |
| Woody Vine Stratum (Plot size: <u>30</u>) | | | | |
| 1. <u>Bignonia capreolata</u> | <u>20</u> | <u>Y</u> | <u>FAC</u> | Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ |
| 2. <u>Lonicera japonica</u> | <u>10</u> | <u>Y</u> | <u>FACU</u> | |
| 3. _____ | _____ | _____ | _____ | |
| 4. _____ | _____ | _____ | _____ | |
| 5. _____ | _____ | _____ | _____ | |
| <u>30.0</u> = Total Cover 50% of total cover: <u>15.0</u> 20% of total cover: <u>6.0</u> | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) FACU plants near boundary | | | | |

SOIL

Sampling Point: WBwet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-8 | 10YR 4/2 | 70 | 10YR 3/6 | 30 | C | M/PL | L | |
| 8-12 | 10YR 4/1 | 80 | 10YR 5/8 | 20 | C | PL | CL | |
| | | | | | | | | |
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| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators: | Indicators for Problematic Hydric Soils ³ : |
|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Coast Prairie Redox (A16) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> (MLRA 147, 148) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> (MLRA 136, 147) |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Thick Dark Surface (A12) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | |
| <input type="checkbox"/> Sandy Redox (S5) | |
| <input type="checkbox"/> Stripped Matrix (S6) | |
| <input type="checkbox"/> Dark Surface (S7) | |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | |
| <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | |
| <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input checked="" type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Redox Dark Surface (F6) | |
| <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Redox Depressions (F8) | |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | |
| <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | |
| <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| | |
|---|--|
| Restrictive Layer (if observed): Type: _____ Depth (inches): _____ | Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ |
|---|--|

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Chambers Co Landfill City/County: Chambers County Sampling Date: 2023-03-16

Applicant/Owner: _____ State: Alabama Sampling Point: WDup

Investigator(s): Phil May Section, Township, Range: sec 36 T022N R027E

Landform (hillslope, terrace, etc.): Other Local relief (concave, convex, none): None Slope (%): 0-2

Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 32.851238 Long: -85.287693 Datum: WGS84

Soil Map Unit Name: Sandy alluvial land, poorly to somewhat poorly drained NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
|---|---|

Remarks:

HYDROLOGY

| | |
|---|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13) | <u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5) |
|---|--|

| | |
|---|---|
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe) | Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> |
|---|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WDup

| | Absolute % Cover | Dominant Species? | Indicator Status | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------------------|-------------------|------------------|---|-------------------|-------------|--------------|-------------|-------------|-------------|-------|-------------|--------------|--------------|-------|--------------|-------------|---------------|-------|---------------|--------------|--------------|-------|--------------|-------------|--------------|-------|---------------|----------------|---------------|-----|---------------|--------------------------------------|--|--|--|
| Tree Stratum (Plot size: <u>30</u>) | | | | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>71.43</u> (A/B) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. <u><i>Pinus taeda</i></u> | <u>80</u> | <u>Y</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. <u><i>Carya ovata</i></u> | <u>20</u> | <u>Y</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{100.0}{50.0} = \text{Total Cover}$ 50% of total cover: <u>50.0</u> 20% of total cover: <u>20.0</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15</u>) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. <u><i>Carpinus caroliniana</i></u> | <u>20</u> | <u>Y</u> | <u>FAC</u> | Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="text-align:right">Total % Cover of:</td> <td style="text-align:center"><u>0.00</u></td> <td style="text-align:right">Multiply by:</td> <td style="text-align:center"><u>0.00</u></td> </tr> <tr> <td>OBL species</td> <td style="text-align:center"><u>0.00</u></td> <td>x 1 =</td> <td style="text-align:center"><u>0.00</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center"><u>10.00</u></td> <td>x 2 =</td> <td style="text-align:center"><u>20.00</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center"><u>130.00</u></td> <td>x 3 =</td> <td style="text-align:center"><u>390.00</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center"><u>20.00</u></td> <td>x 4 =</td> <td style="text-align:center"><u>80.00</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center"><u>20.00</u></td> <td>x 5 =</td> <td style="text-align:center"><u>100.00</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center"><u>180.00</u></td> <td>(A)</td> <td style="text-align:center"><u>590.00</u></td> </tr> <tr> <td colspan="4" style="text-align:right">Prevalence Index = B/A = <u>3.28</u></td> </tr> </table> | Total % Cover of: | <u>0.00</u> | Multiply by: | <u>0.00</u> | OBL species | <u>0.00</u> | x 1 = | <u>0.00</u> | FACW species | <u>10.00</u> | x 2 = | <u>20.00</u> | FAC species | <u>130.00</u> | x 3 = | <u>390.00</u> | FACU species | <u>20.00</u> | x 4 = | <u>80.00</u> | UPL species | <u>20.00</u> | x 5 = | <u>100.00</u> | Column Totals: | <u>180.00</u> | (A) | <u>590.00</u> | Prevalence Index = B/A = <u>3.28</u> | | | |
| Total % Cover of: | <u>0.00</u> | Multiply by: | <u>0.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OBL species | <u>0.00</u> | x 1 = | <u>0.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FACW species | <u>10.00</u> | x 2 = | <u>20.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FAC species | <u>130.00</u> | x 3 = | <u>390.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FACU species | <u>20.00</u> | x 4 = | <u>80.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UPL species | <u>20.00</u> | x 5 = | <u>100.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Column Totals: | <u>180.00</u> | (A) | <u>590.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Prevalence Index = B/A = <u>3.28</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. <u><i>Oxydendrum arboreum</i></u> | <u>20</u> | <u>Y</u> | <u>UPL</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. <u><i>Vaccinium corymbosum</i></u> | <u>10</u> | <u>Y</u> | <u>FACW</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{50.0}{25.0} = \text{Total Cover}$ 50% of total cover: <u>25.0</u> 20% of total cover: <u>10.0</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Herb Stratum (Plot size: <u>5</u>) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. _____ | | | | Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is $\leq 3.0^1$ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{0}{0.0} = \text{Total Cover}$ 50% of total cover: <u>0.0</u> 20% of total cover: <u>0.0</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Woody Vine Stratum (Plot size: <u>30</u>) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. <u><i>Smilax rotundifolia</i></u> | <u>20</u> | <u>Y</u> | <u>FAC</u> | Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. <u><i>Gelsemium sempervirens</i></u> | <u>10</u> | <u>Y</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{30.0}{15.0} = \text{Total Cover}$ 50% of total cover: <u>15.0</u> 20% of total cover: <u>6.0</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) Herb layer absent due to season | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SOIL

Sampling Point: WDup

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-4 | 10YR 4/3 | 50 | | | | | L | |
| | 10YR 4/6 | 50 | | | | | L | |
| 4-12 | 7.5YR 4/6 | 100 | | | | | L | |
| | | | | | | | | |
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¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| | | |
|--|--|---|
| Hydric Soil Indicators: | | Indicators for Problematic Hydric Soils³: |
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | <input type="checkbox"/> Coast Prairie Redox (A16) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | (MLRA 147, 148) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Depleted Matrix (F3) | (MLRA 136, 147) |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| | |
|---|---|
| Restrictive Layer (if observed): Type: _____ Depth (inches): _____ | Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> |
|---|---|

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Chambers Co Landfill City/County: Chambers County Sampling Date: 2023-03-16
 Applicant/Owner: _____ State: Alabama Sampling Point: WDwet
 Investigator(s): Phil May Section, Township, Range: sec 36 T022N R027E
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 32.851184 Long: -85.287661 Datum: WGS84
 Soil Map Unit Name: Sandy alluvial land, poorly to somewhat poorly drained NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: | |

HYDROLOGY

| | |
|--|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Water Marks (B1) _____ Presence of Reduced Iron (C4) <input checked="" type="checkbox"/> Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) <input checked="" type="checkbox"/> Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) <input checked="" type="checkbox"/> Iron Deposits (B5) _____ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) _____ Aquatic Fauna (B13) | <u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5) |
|--|--|

| | |
|--|--|
| Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe) | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
|--|--|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WDwet

| | Absolute % Cover | Dominant Species? | Indicator Status | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-------------------|-------------------|-------------------|---|-------------------|-------------|--------------|-------------|-------------|-------------|-------|-------------|--------------|--------------|-------|--------------|-------------|---------------|-------|---------------|--------------|--------------|-------|--------------|-------------|-------------|-------|-------------|----------------|-------------------|--|-------------------|
| Tree Stratum (Plot size: <u>30</u>) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. <u>Betula nigra</u> | <u>40</u> | <u>Y</u> | <u>FACW</u> | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>85.71</u> (A/B) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. <u>Acer rubrum</u> | <u>30</u> | <u>Y</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. <u>Liquidambar styraciflua</u> | <u>30</u> | <u>Y</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{100.0}{50.0} = \text{Total Cover}$ 50% of total cover: <u>50.0</u> 20% of total cover: <u>20.0</u> | | | | Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="text-align:right">Total % Cover of:</td> <td style="text-align:center"><u>0.00</u></td> <td style="text-align:right">Multiply by:</td> <td style="text-align:center"><u>0.00</u></td> </tr> <tr> <td>OBL species</td> <td style="text-align:center"><u>0.00</u></td> <td>x 1 =</td> <td style="text-align:center"><u>0.00</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center"><u>40.00</u></td> <td>x 2 =</td> <td style="text-align:center"><u>80.00</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center"><u>120.00</u></td> <td>x 3 =</td> <td style="text-align:center"><u>360.00</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center"><u>10.00</u></td> <td>x 4 =</td> <td style="text-align:center"><u>40.00</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center"><u>0.00</u></td> <td>x 5 =</td> <td style="text-align:center"><u>0.00</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center"><u>170.00</u> (A)</td> <td></td> <td style="text-align:center"><u>480.00</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>2.82</u> | Total % Cover of: | <u>0.00</u> | Multiply by: | <u>0.00</u> | OBL species | <u>0.00</u> | x 1 = | <u>0.00</u> | FACW species | <u>40.00</u> | x 2 = | <u>80.00</u> | FAC species | <u>120.00</u> | x 3 = | <u>360.00</u> | FACU species | <u>10.00</u> | x 4 = | <u>40.00</u> | UPL species | <u>0.00</u> | x 5 = | <u>0.00</u> | Column Totals: | <u>170.00</u> (A) | | <u>480.00</u> (B) |
| Total % Cover of: | <u>0.00</u> | Multiply by: | <u>0.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OBL species | <u>0.00</u> | x 1 = | <u>0.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FACW species | <u>40.00</u> | x 2 = | <u>80.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FAC species | <u>120.00</u> | x 3 = | <u>360.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FACU species | <u>10.00</u> | x 4 = | <u>40.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UPL species | <u>0.00</u> | x 5 = | <u>0.00</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Column Totals: | <u>170.00</u> (A) | | <u>480.00</u> (B) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15</u>) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. <u>Carpinus caroliniana</u> | <u>20</u> | <u>Y</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. <u>Liquidambar styraciflua</u> | <u>20</u> | <u>Y</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. <u>Liriodendron tulipifera</u> | <u>10</u> | <u>Y</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{50.0}{25.0} = \text{Total Cover}$ 50% of total cover: <u>25.0</u> 20% of total cover: <u>10.0</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Herb Stratum (Plot size: <u>5</u>) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{0}{0.0} = \text{Total Cover}$ 50% of total cover: <u>0.0</u> 20% of total cover: <u>0.0</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Woody Vine Stratum (Plot size: <u>30</u>) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. <u>Gelsemium sempervirens</u> | <u>20</u> | <u>Y</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\frac{20.0}{10.0} = \text{Total Cover}$ 50% of total cover: <u>10.0</u> 20% of total cover: <u>4.0</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) Herbs absent due to season and inudation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SOIL

Sampling Point: WDwet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks | | |
|-------------------|---------------|-----|----------------|---------------|-----|----|---------|---------|-------------------|------------------|
| | Color (moist) | | % | Color (moist) | | % | | | Type ¹ | Loc ² |
| 0-7 | 10YR | 4/2 | 60 | 10YR | 4/6 | 40 | C | M | CL | |
| 7-11 | 10YR | 4/2 | 60 | 10YR | 3/6 | 40 | C | M/PL | SCL | |
| 11-15 | 2.5Y | 6/3 | 70 | 10YR | 3/6 | 30 | C | M | SC | |
| | | | | | | | | | | |
| | | | | | | | | | | |
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| | | | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators: | | Indicators for Problematic Hydric Soils ³ : | |
|--|--|---|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) | |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | <input type="checkbox"/> Coast Prairie Redox (A16) | |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | <input type="checkbox"/> (MLRA 147, 148) | |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) | |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> (MLRA 136, 147) | |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Other (Explain in Remarks) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) | | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

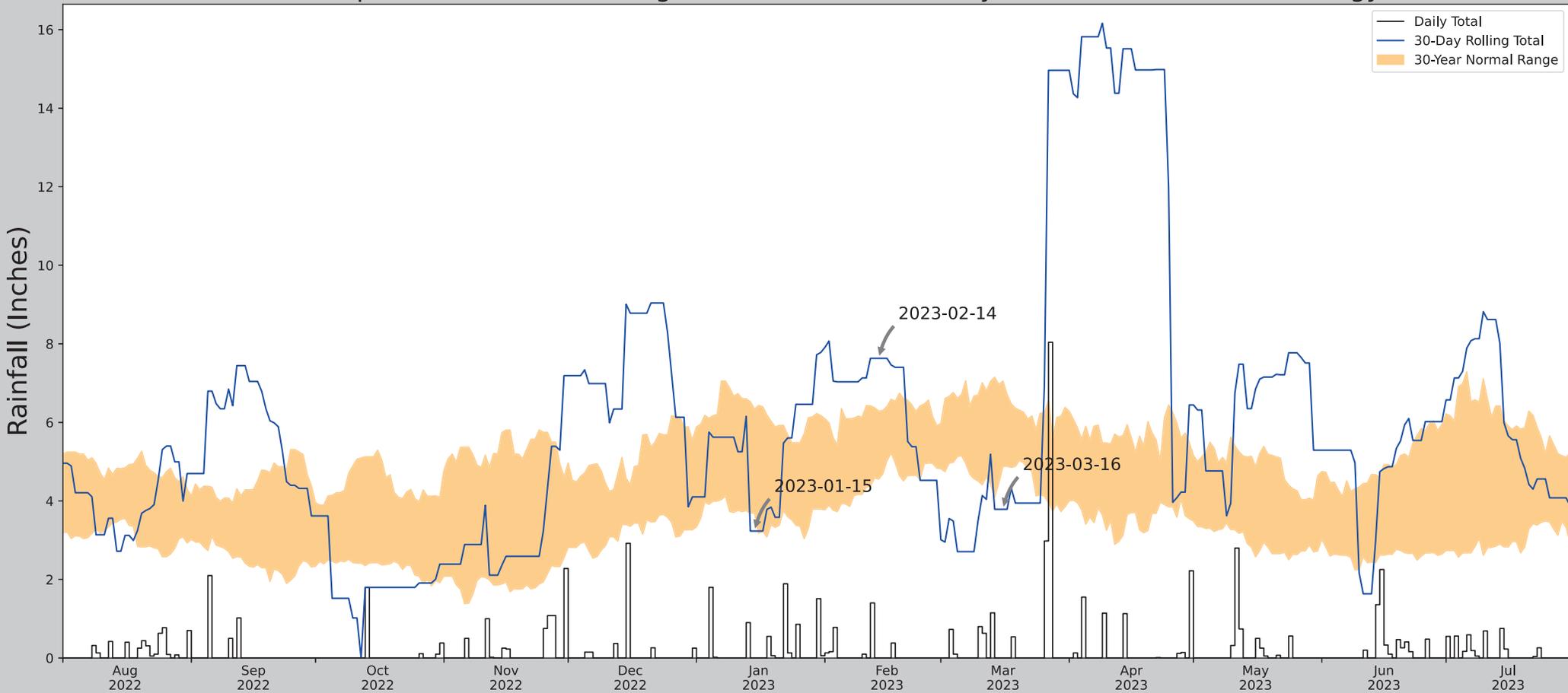
| | |
|---|--|
| Restrictive Layer (if observed): Type: _____ Depth (inches): _____ | Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ |
|---|--|

Remarks:

ATTACHMENT 2

USACE ANTECEDENT PRECIPITATION TOOL REPORT

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



| | |
|----------------------------------|-----------------------|
| Coordinates | 32.851184, -85.287661 |
| Observation Date | 2023-03-16 |
| Elevation (ft) | 688.422 |
| Drought Index (PDSI) | Mild wetness |
| WebWIMP H ₂ O Balance | Wet Season |

| 30 Days Ending | 30 th %ile (in) | 70 th %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|----------------|----------------------------|----------------------------|---------------|-------------------|-----------------|--------------|------------------------|
| 2023-03-16 | 4.881103 | 7.050394 | 3.787402 | Dry | 1 | 3 | 3 |
| 2023-02-14 | 4.556693 | 6.288189 | 7.629922 | Wet | 3 | 2 | 6 |
| 2023-01-15 | 3.691732 | 6.338977 | 3.232284 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Normal Conditions - 10 |



Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|----------------------|-------------------|----------------|---------------|-------------|------------|-------------|-----------------|
| LAFAYETTE 2W | 32.9069, -85.4336 | 740.158 | 9.302 | 51.736 | 4.667 | 10287 | 90 |
| CAMP HILL 2NW | 32.8236, -85.6561 | 680.118 | 14.137 | 60.04 | 7.21 | 993 | 0 |
| DADEVILLE 2 | 32.8603, -85.7475 | 729.003 | 18.496 | 11.155 | 8.53 | 67 | 0 |
| ROCK MILLS | 33.1581, -85.2911 | 750.0 | 19.219 | 9.842 | 8.838 | 6 | 0 |

ATTACHMENT 3
USFWS IPaC REPORT

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Chambers County, Alabama



Local office

Alabama Ecological Services Field Office

☎ (251) 441-5181

📠 (251) 441-6222

✉ alabama@fws.gov

1208 B Main Street
Daphne, AL 36526-4419

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

-
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
 2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office

of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

| NAME | STATUS |
|---|---------------------|
| <p>Northern Long-eared Bat <i>Myotis septentrionalis</i></p> <p>Wherever found</p> <p>This species only needs to be considered if the following condition applies:</p> <ul style="list-style-type: none"> This species only needs to be considered if the project includes wind turbine operations. <p>No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045</p> | Endangered |
| <p>Tricolored Bat <i>Perimyotis subflavus</i></p> <p>Wherever found</p> <p>This species only needs to be considered if the following condition applies:</p> <ul style="list-style-type: none"> This species only needs to be considered if the project includes wind turbine operations. <p>No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515</p> | Proposed Endangered |

Birds

| NAME | STATUS |
|--|----------------------|
| <p>Whooping Crane <i>Grus americana</i></p> <p>No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/758</p> | EXPN |

Reptiles

| NAME | STATUS |
|---|---------------------|
| <p>Alligator Snapping Turtle <i>Macrochelys temminckii</i></p> <p>Wherever found</p> <p>No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4658</p> | Proposed Threatened |

Insects

| NAME | STATUS |
|---|-----------|
| Monarch Butterfly <i>Danaus plexippus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743 | Candidate |

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act¹ and the Migratory Bird Treaty Act².

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats³, should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "[Supplemental Information on Migratory Birds and Eagles](#)".

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to [Bald Eagle Nesting and Sensitivity to Human Activity](#)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON |
|--|------------------------|
| <p>Bald Eagle <i>Haliaeetus leucocephalus</i></p> <p>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.</p> <p>https://ecos.fws.gov/ecp/species/1626</p> | Breeds Sep 1 to Jul 31 |

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read ["Supplemental Information on Migratory Birds and Eagles"](#), specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ■

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence

at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.

- The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

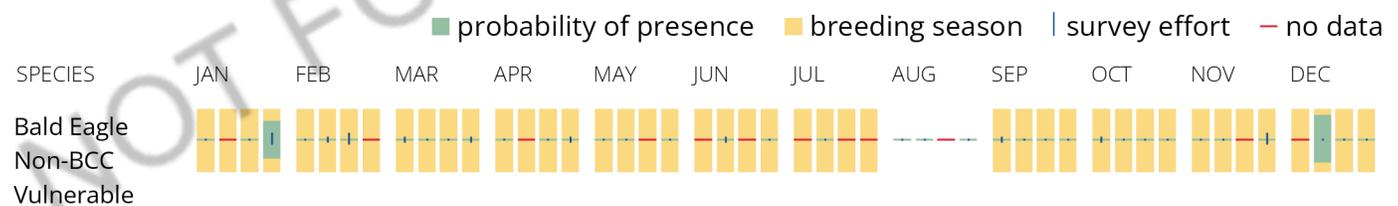
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply). To see a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the [Eagle Act](#) should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats³ should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "[Supplemental Information on Migratory Birds and Eagles](#)".

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

The birds listed below are birds of particular concern either because they occur on the

[USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON |
|--|-------------------------|
| <p>Bald Eagle <i>Haliaeetus leucocephalus</i></p> <p>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.</p> <p>https://ecos.fws.gov/ecp/species/1626</p> | Breeds Sep 1 to Jul 31 |
| <p>Chimney Swift <i>Chaetura pelagica</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> | Breeds Mar 15 to Aug 25 |
| <p>Rusty Blackbird <i>Euphagus carolinus</i></p> <p>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p> | Breeds elsewhere |

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read ["Supplemental Information on Migratory Birds and Eagles"](#), specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

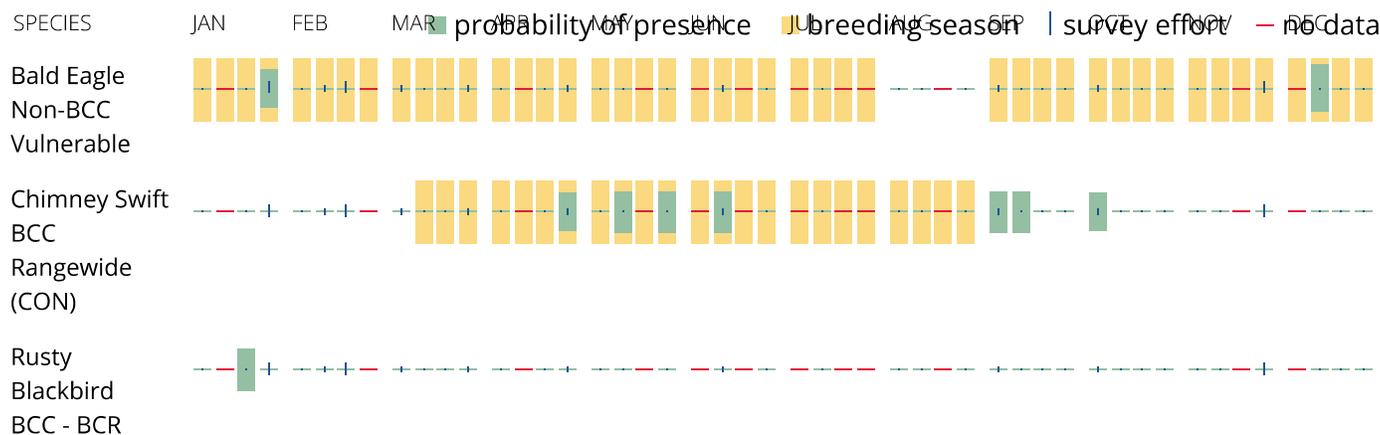
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the [Probability of Presence Summary](#). [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret

them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

(NWI)

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

This location did not intersect any wetlands mapped by NWI.

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas

should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

Attachment C

Geologic & Hydrogeologic Reports

**Siting Standards
Chambers County Landfill
May 2024**

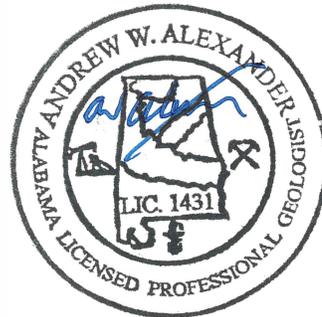
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LIMITED HYDROGEOLOGIC ASSESSMENT

CHAMBERS COUNTY LANDFILL
LANETT, ALABAMA

Permit No. 09-02

Prepared For:
Chambers County Landfill, LLC
P.O. Box 86
West Point, Georgia 31833



BLE Project Number J23-18020-02

May 9, 2024



6004 Ponders Court | Greenville, SC 29615
864.288.1265 864.288.4330 info@blecorp.com
BLECORP.COM



May 9, 2024

Chambers County Landfill, LLC
P.O. Box 86
West Point, Georgia 31833

Attention: Mr. Nathan Dunn, P.E.

Subject: **Limited Hydrogeologic Assessment**
Chambers County Landfill
Lanett, Alabama
Permit No. 09-02
BLE Project Number J23-18020-02

Dear Mr. Dunn:

As authorized, Bunnell-Lammons Engineering, Inc. (BLE) has completed a limited hydrogeologic assessment in support of a proposed lateral expansion to the Chambers County Landfill located in Lanett, Alabama. This assessment addresses the limited hydrogeologic investigation of two proposed expansion areas located to the west (approximately 25 acres) and to the northeast (approximately 43 acres) which is within the current facility boundary. The attached report describes the work performed and presents the results obtained.

We appreciate the opportunity to serve as your hydrogeological consultant on this project and look forward to working with you on future projects. If you have any questions, please contact us at (864) 288-1265.

Sincerely,

BUNNELL LAMMONS ENGINEERING INC.

A handwritten signature in blue ink that reads 'Zachery J. Downes'.

Zachery J. Downes
Project Geologist

A handwritten signature in blue ink that reads 'Andrew W. Alexander'.

Andrew W. Alexander, P.G.
Consultant Hydrogeologist
Registered, Alabama No. 1431

cc: Mr. Jeff Browne, P.E. – Browne and Company, LLC
Mr. Thomas O'Shea – BLE



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1.0 PROJECT INFORMATION

Chambers County, Alabama owns a permitted Industrial Landfill located at 7245 Veterans Memorial Parkway, Lanett, AL 36863 (**Figure 1**). The facility is operated by Chambers County Landfill, LLC. We understand that Mr. Jeff Browne, P.E. of Browne and Company, LLC (Browne) has been retained by Chambers County Landfill, LLC to provide design and permitting services for a lateral expansion of the subject landfill. The expansion incorporates additional property to the west (approximately 25 acres, which is currently part of the permitted acreage), and to the northeast (approximately 43 acres) which is within the current facility boundary.

Browne requested that BLE perform a limited hydrogeologic assessment in support of the design and permitting efforts. We understand that the findings of this limited hydrogeological assessment will be utilized by Browne for planning efforts.

The existing groundwater monitoring network at the subject facility consists of seven (7) monitoring wells (MW-3R, MW-5R, MW-6R, MW-7R, MW-8, MW-9, and MW-10), which were utilized as part of this assessment.

This *Limited Hydrogeologic Assessment Report* addresses the geological and hydrogeological investigation required for the site permitting process for the landfill expansion. This assessment was performed in general accordance with Alabama Department of Environmental Management (ADEM) solid waste regulations, Division 335-13. Specifically, this report addresses ADEM Regulation 335-13-4-.01(1) [*Location Standards*], 335-13-4-.11(2) regarding hydrogeologic standards for vertical separation of the liner system and groundwater, and 335-13-4-.13 [*Site Geology and Hydrogeology*].

2.0 GEOLOGIC SETTING AND LITERATURE REVIEW

2.1 Physiographic and Topographic Setting

The site is located in the Greenville Slope Subdistrict of the Inner Piedmont District of the Piedmont Upland Section (Osborne and others, 1989). The Greenville Slope Subdistrict is characterized by rolling topography that generally slopes from a northern high to a southern low.

The site's natural topography consists of a central topographic high that slopes radially to the west and south. The west expansion area slopes evenly westward. The north expansion area has a northwest trending topographic ridge along its eastern boundary that slopes to the north and southwest.

Surface water flow as interpreted from topography in the west expansion area flows westward to a southwest flowing unnamed tributary of the Little Osanippa Creek while in the north expansion area flow is to the south to a southeast flowing unnamed tributary of the Little Osanippa Creek (**Figure 1 and 2**).

2.2 Regional Geologic Setting

Bedrock in the Inner Piedmont district consists of the Dadeville Complex and Opelika Complex, both of which are Precambrian to Paleozoic in age (Osborne and others, 1989). Both complexes are comprised of high-grade metamorphic and igneous rocks originating from the Taconian Orogeny. The main units within the Dadeville complex include the Agricola Schist, the Waverly Gneiss, and Ropes Creek Amphibolite, in descending order. Through a series of thrust faulting and erosion, klippe of the Ropes Creek Amphibolite are present above the Waverly Gneiss in the Inner Piedmont District (Merschhat et al., 2005).

2.3 Regional Hydrogeologic Setting

Portions of the information presented below were taken from the *Hydrogeology and Vulnerability to Contamination of Major Aquifers in Alabama: Area 5* (Kopaska-Merkel and others, 2000), and the *Ground Water Atlas of the United States, Segment 6* (Miller, 1990).

The Inner Piedmont District is dominated by metasedimentary, metagranite, and metavolcanic aquifers consisting of a bedrock portion and an overlying regolith (saprolite and soil [overburden]) portion. Groundwater within the Inner Piedmont generally moves from topographically high areas (recharge zones) to topographically low areas within and along stream valleys (discharge areas) (Fetter, 2001; Feaster and Guimaraes, 2017).

The regolith portion of the aquifers are generally unconfined and exist under water table conditions. The regolith has greater porosity than the bedrock and acts as a reservoir. Groundwater then enters the bedrock via connected fractures, creating an interconnected aquifer system. Recharge to the aquifers is generally rainfall and occurs in the upland areas whereas discharge from the aquifers will occur to lowland streams and wetlands.

3.0 FIELD PROCEDURES AND ACTIVITIES

3.1 General

Nine (9) groundwater piezometers (BLE-1 through BLE-9) were installed in residual soils and one (1) soil boring (BLE-R1) was performed at the site as part of this assessment. The piezometer and boring locations are shown on **Figure 2**.

Field activities were performed between April 20-26, 2023. Tri-State Drilling, LLC performed the drilling and groundwater piezometer installation activities.

BLE provided the services of a geologist (working under the direction of an Alabama licensed geologist) to supervise the field activities. A registered land surveyor from Wellston Associates Land Surveyors, LLC of Warner Robins, Georgia performed the as-built surveying after completion of the drilling activities. The as-built survey data are included in **Table 1** and **Appendix A**.

3.1.1 Drilling Procedures and Subsurface Conditions Encountered

The borings were performed using a CME-55, ATV-mounted drilling rig. Soil borings were advanced by twisting a continuous flight of steel, 7.25-inch Outer Diameter (O.D.) hollow-stem augers into the soil.

The soil descriptions recorded on the boring logs in **Appendix B** are based on visual examination. The descriptions conform to the Unified Soil Classification System (USCS).

3.1.2 Groundwater Piezometer Installation and Construction

The groundwater piezometers consist of 2-inch diameter polyvinyl chloride (PVC; Johnson Schedule 40, NSF-rated) casing with flush-threaded joints inserted in 7.25-inch nominal diameter boreholes. The bottom 5 to 10-foot section of each piezometer is a manufactured well screen with 0.010-inch-wide machined slots with a 0.20-foot-long sediment trap threaded onto the bottom of the screen section. In the borehole annulus, silica filter sand (DSI, #2) was placed around the outside of the pipe to above the top of the screened section. A hydrated bentonite seal (Baroid 3/8th-inch diameter chips) was installed on top of the filter sand backfill to seal the piezometers at the desired levels. The remainder of the well annulus was backfilled with 3/8th-inch bentonite chips, hydrated in lifts, to ground surface. The surface completion of each piezometer consisted of a PVC stickup with expandable locking cap, and a vent hole installed in the PVC casing. A table summarizing the groundwater piezometer construction is included as **Table 2**.

The screen section of the nine (9) groundwater piezometers were set to intersect groundwater in the residual soils of the site.

4.0 SITE GEOLOGY

Bedrock at the site consists of the Ropes Creek Amphibolite and Waverly Gneiss of the Dadeville Complex, which consists of layered and massive amphibolite and feldspathic, biotite-hornblende gneiss with thin layers of amphibolite, respectively (Osborne and others, 1989). The geology includes residual soil which developed from in place weathering of the parent material, which is underlain by either the Ropes Creek Amphibolite or the Waverly Gneiss of the Dadeville Complex.

The typical residual soil profile consists of silty and clayey soils near the surface, where soil weathering is more advanced, underlain by micaceous sandy silts and silty sands. Residual soil zones developed by the in-situ chemical weathering of bedrock are commonly referred to as “saprolite.” Saprolite is usually sandy with rock fragments and lesser amounts of silt and clay. The thickness of the saprolite in the Piedmont ranges from a few feet to more than 100 feet. (Hack, 1989). The boundary between soil and rock is not sharply defined.

A transitional zone of partially weathered rock (PWR) is normally found overlying the parent bedrock. For engineering purposes, PWR is defined as residual material with a standard penetration resistance in excess of 100 blows per foot (bpf). Fractures, joints, and the presence of less resistant rock types facilitate weathering. Consequently, the profile of the PWR and hard rock is quite irregular and erratic, even over short horizontal distances. Also, it is not unusual to find lenses and boulders of hard rock and zones of PWR within the soil mantle, well above the general bedrock level.

One boring, BLE-R1, encountered auger refusal above groundwater and was not completed as a piezometer. Four additional borings (BLE-3, BLE-5, BLE-6, and BLE-9) encountered auger refusal between three (3) and seventeen (17) feet below the first occurrence of groundwater (**Table 2**). An inferred top of rock (auger refusal) elevation contour map is included as **Figure 3**.

5.0 SITE HYDROGEOLOGY

Water level measurements were collected from nine (9) new piezometers (BLE-1 through BLE-9) and seven (7) existing monitoring wells (MW-3R, MW-5R, MW-6R, MW-7R, MW-8, MW-9, and MW-10) as part of this assessment. In general, groundwater is present above the bedrock surface in the piezometers. No boring log or well construction information for the existing monitoring wells was available for review at the time of this report. Existing monitoring wells were surveyed for horizontal and vertical control by Wellston Associates Land Surveyors, LLC of Warner Robins, Georgia. The as-built survey data are included in **Table 1** and **Appendix A**.

5.1 Precipitation and Seasonal Groundwater Level Trends

The relationship between precipitation and groundwater levels at the site was evaluated using Historical National Oceanic and Atmospheric Administration (NOAA) precipitation data for the Chambers County area, and water level measurements at the site between June 2022 and April 2024 (**Table 3**).

Historical NOAA monthly precipitation data were obtained from Division 5, Alabama for the period of January 2022 through April 2024. The data are summarized seasonally in **Appendix C** such that January-March represents winter, April-June represents spring, July-September represents summer, and October-December represents fall.

Historically in the Chambers County area, winter months will experience relatively higher amounts of precipitation, with slightly less precipitation in the summer, spring, and fall, respectively (**Appendix C**). In the summer months, the effects of evapotranspiration offset the contribution of this precipitation to recharge of the uppermost aquifer. Because of these natural trends, the amount of groundwater recharge and subsequent increase in groundwater elevation is typically greatest during winter and spring seasons. Annually, the region receives an average of approximately 51 inches per year (in/yr).

Years 2022, 2023, and 2024 had near normal amounts of annual precipitation in the region surrounding the site. The highest amount of rain was recorded during the winter of 2024. The Palmer Drought Severity Index (PDSI; **Appendix C**) shows that the region surrounding the site was in a period of near normal precipitation during the period of water level collection at the facility, which means the groundwater elevations utilized for this study from February 2024 through March 2024 (**Table 3**) represent a period of near normal rainfall.

ADEM Regulation 335-13-4-.11(2)(a) requires that water levels be collected two times per month during February, March and April of the year(s) being evaluated, for a total of six (6) measurements. Groundwater measurements (tabulated on **Table 3**) were collected from the piezometers and monitoring wells as follows:

- February 2024 – Measurements were collected from the nine (9) piezometers and from the seven (7) groundwater monitoring wells at the landfill on February 20, 2024.
- March 2024 – Measurements were collected from the nine (9) piezometers and from the seven (7) groundwater monitoring wells at the landfill on March 7 and 27, 2024.
- April 2024 – Measurements were collected from the nine (9) piezometers and from the seven (7) groundwater monitoring wells at the landfill on April 10 and 23, 2024. Measurements were collected from only the nine (9) piezometers on April 17, 2024 during a hydraulic testing event.

A second round of groundwater measurements was not collected in February 2024. However, the February 20, 2024 event did not contain any of the highest recorded groundwater elevations during the study period in any of the piezometers or wells. Three rounds of measurements were collected in April 2024 to complete six measurement events. The groundwater measurement events that did contain seasonal high groundwater elevations ranked as follows: March 27, 2024 (7 seasonal highs), April 17, 2024 (5 seasonal highs), March 7, 2024 (3 seasonal highs), and April 23, 2024 (2 seasonal highs).

5.2 Water Table Elevation and Groundwater Flow direction

Water levels collected from the existing monitoring wells and newly installed piezometers in April and May 2023, and February through April 2024 are included on **Table 3**. A groundwater elevation contour map for the uppermost aquifer was prepared for the site using the water level data collected on March 27, 2024 (**Figure 4**). A composite seasonal high groundwater elevation contour map was prepared for the site utilizing the highest measured groundwater elevation in each well/piezometer during the 2024 study period (**Figure 5**).

The configuration of the water table in the uppermost aquifer is generally a subdued replica of the ground topography with flow generally to the west and southwest. Recharge to the aquifer occurs in the upland portions of the site. Shallow groundwater discharges to the southward flowing drainage feature located in the center of the Chambers County Landfill (closed) and to the wetlands west of the Chambers County Landfill (active).

5.3 Hydraulic Coefficients and Groundwater Flow Velocity

5.3.1 Hydraulic Conductivity

Hydraulic conductivity is defined as the ability of the aquifer material to conduct water under a hydraulic gradient. Eight (8) slug tests were performed at the site to measure the *in situ* hydraulic conductivity of the different zones of the water-table aquifer. The slug test results were evaluated using the *Bouwer and Rice Method (1976)* for completely penetrating wells in an unconfined aquifer. The slug tests performed at the site are summarized on **Table 4** and include four (4) falling head tests and four (4) rising head tests in piezometers set in the uppermost aquifer which consists of sandy residual soils (BLE-2, BLE-4, BLE-6, and BLE-7). The slug test data and graphs are included in **Appendix D**.

The range of calculated hydraulic conductivity values is 1.94 feet/day (BLE-7) to 4.42 feet/day (BLE-4) in the sandy formations (geometric mean of 3.31 feet/day) based on the slug tests conducted at the site.

5.3.2 Hydraulic Gradient

The hydraulic gradient is determined by dividing the difference in groundwater elevations at two locations by the horizontal distance between those locations along the direction of groundwater flow. Hydraulic gradients were measured from the March 27, 2024 groundwater elevation contour map (**Figure 4**). Hydraulic gradients at the site range from about 0.011 in the northern portion of the north expansion area between BLE-6 and BLE-8 to about 0.056 in the northern portion of the west expansion area near BLE-1 and the property boundary. The geometric mean hydraulic gradient across the site is approximately 0.025 (**Table 5**).

5.3.3 Effective Porosity and Specific Yield

Effective porosity is the volume of void spaces through which water or other fluids can travel in soil divided by the total volume of the soil. Effective porosity can be assumed to be approximately equal to specific yield. Specific yield is defined as the ratio of the volume of water that drains from saturated sediment owing to the attraction of gravity to the total volume of sediment. Effective porosity ranges from 1.0% to 46.0% (geometric mean of 7.0%) in the sand aquifer based on published effective porosity values of fine to coarse sand (McWhorter and Sunada, 1977).

5.3.4 Groundwater Flow Velocity

The horizontal groundwater flow velocity across the site is calculated to be approximately 0.55 to 2.71 feet/day in the sand aquifer (**Table 5**) using the formula below.

The velocity of groundwater seepage is derived from the equation:

$$V = \frac{Ki}{n_e}$$

Where

V is the flow velocity;
 K is the hydraulic conductivity;
 i is the hydraulic gradient; and
 n_e is the effective porosity.

6.0 AREA AND SITE RECONNAISSANCE

A vehicular reconnaissance was performed in April 2024 to identify private water wells within a one-mile radius from the site's property boundary. BLE personnel recorded notes on whether municipal water meters, fire hydrants, or other water utility infrastructure was observed along roadways and property lines during the vehicular reconnaissance.

Three (3) private wells and one (1) suspected private well were observed within the one-mile radius of the site. The approximate locations of these wells are shown on **Figure 6** and are described as follows:

- Two wells at habitable residences with apparent public water system connection;
- One suspected private well at inhabitable or former (abandoned) residences;
- One well at the Chambers County Landfill used for non-potable purposes.

Municipal water infrastructure (i.e., fire hydrants) was observed along many of the roads within one mile from the landfill including: Veterans Memorial Parkway (SR 50), County Road 180, and the secondary residential roads (**Figure 6**). This suggests that residents along these roads have access to municipal drinking water. Information provided by the City of Lanett Water/Sewage Department confirmed that most residences in the vicinity of the site are connected to the public water system.

7.0 LOCATION RESTRICTIONS

7.1 PROXIMITY TO 100-YEAR FLOODPLAIN

Regulation 335-13-4-.01(1)(a): A facility located in a floodplain shall not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in a washout of solid waste so as to pose a hazard to human health and the environment.

The site is not within the 100-Year Floodplain as identified by the Federal Emergency Management Agency (FEMA, 2011), Flood Insurance Rate Map according to According to Panel 275 of 425, Map #01017C0275C (**Figure 7**). The closest mapped area within the 100-year floodplain is located approximately 380 feet southwest of the site along Little Osanippa Creek.

7.2 PROXIMITY TO AIRPORT LOCATIONS

Regulation 335-13-4-.01(1)(c): A MSWLF unit shall not be sited within 10,000 feet of any airport runway end. Owners or operators proposing to renew existing or site new MSWLF units located within a five-mile radius of any airport runway must notify the affected airport and the Federal Aviation Administration (FAA).

According to the Atlanta Sectional Aeronautical Chart prepared by the Federal Aviation Administration effective from March 21, 2024, to May 16, 2024 (**Figure 8**), the nearest airport to the Chambers County Landfill is the Lanett Regional Airport, which is located approximately 4.2 miles southeast of the site. The site is therefore not located within 10,000 feet of any airport runway.

Proposed landfills must also comply with the *Wendell H. Ford Aviation Investment and Reform Act*, which went into effect April 5, 2000. This Act requires a minimum of six miles separation between qualified airports and landfills. The Lanett Regional Airport is the only airport located within six miles of the site but does not have commercial flight service and does not have control towers (Wendell Ford qualifying airports typically have both). Therefore, no qualified airports are located within six miles of the site.

Airport locations are not “location restrictions” for this type of Industrial Landfill in Alabama. The information provided above is for informational purposes only.

7.3 GEOLOGIC AND HYDROGEOLOGIC EVALUATION

Regulation 335-13-4-.01(1)(d)1: Site specific evaluations for geology and hydrogeology shall comply with 335-13-4-.11 through 335-13-4-.14.

The hydrogeologic properties of the geologic formations present at the site, such as hydraulic conductivity, porosity, flow gradients, and groundwater flow velocity, have been characterized with soil test borings, piezometers, water level measurements, and slug testing of piezometers as detailed in **Section 4.0** (Site Geology) and **Section 5.0** (Site Hydrogeology) of this report. This characterization was performed on the primary geologic unit at the site; the residual soil profile where first occurrence of groundwater was encountered in the sandy silts and silty sands.

7.4 FAULT AREAS

Regulation 335-13-4-.01(1)(d)3: Landfill units shall not be located within 200 feet of a fault that has had displacement in Holocene epoch unless the owner or operator demonstrates to the Department that an alternative setback distance of less than 200 feet will not result in damage to the structural integrity of the facility and will be protective of human health and the environment.

Holocene and younger age faults were not indicated on site or within 200 feet of the site based on our literature review (*Howard and others, 1978; Osborne and others, 1989*) and no evidence of faults were observed during field reconnaissance by BLE personnel in April 2024.

7.5 SEISMIC IMPACT ZONES

Regulation 335-13-4-.01(1)(d)4: Landfill units shall not be located in seismic impact zones, unless the owner or operator demonstrates to the Department that all containment structures, including liners, leachate collection systems and surface water control systems are designed to resist the maximum horizontal acceleration in lithified earth material for the site.

According to *Petersen and others, 2018*, the maximum horizontal acceleration in rock at the site, expressed as a percentage of the earth's gravity (g), is approximately 0.085 with a 2% probability of being exceeded in 50 years (approximately equal to 10% probability in 250 years), and the site, therefore, is not in a Seismic Impact Zone (**Figure 9**).

7.6 UNSTABLE AREAS

Regulation 335-13-4-.01(1)(d)5: Landfill units shall not be located in an unstable area unless engineering measures have been incorporated in the design of the facility to ensure that the integrity of the structural components of the facility will not be disrupted. The following factors must be considered when determining whether an area is unstable: (1) on-site or local soil and subsurface conditions that may result in significant differential settling; (2) on-site or local geologic or geomorphologic features; and (3) on-site or local human-made features or events (both surface and subsurface).

Soil borings performed on the expansion areas during the current site exploration encountered soil penetrative resistances of “very soft” to “very stiff” in silts and “very loose” to “very dense” in sands based on the Unified Soil Classification System (USCS). These soils provide favorable conditions for supporting mass fill which would result from structural fill placement and landfill waste cell construction. Subgrade settlement due to the planned waste should be evaluated by a geotechnical engineer so that anticipated settlement can be accommodated by the landfill design. Isolated areas of relatively soft or loose, compressive alluvial (water-deposited) soils can be expected to exist along creeks and major drainage features.

Natural or man-made features considered to be unstable were not observed at the surface or in the borings and the site is not underlain by shallow karst-forming geologic formations. Consequently, it is our professional opinion that the expansion areas meet the stability requirement of the cited rule.



7.7 PROXIMITY TO WETLANDS

Regulation 335-13-4-.01(2)(c&d): Landfill units including buffer zones shall not be permissible in wetlands, beaches, or dunes. Landfill units shall not be permissible in any location where the disposal of solid waste would significantly degrade wetlands, beaches, or dunes.

An internet database of the National Wetlands Inventory is managed by the U.S. Fish & Wildlife Service. According to the internet database, there are wetlands onsite near the northwestern edge of the west expansion area categorized as Freshwater Forested/Shrub Wetland and near the northern edge of the west expansion area categorized as Riverine and Freshwater Pond.

We understand that wetlands impacts due to the construction of the landfill are not currently planned.

We understand that a wetlands report prepared by Inver Environmental Consulting, LLC (Inver) dated April 18, 2024 that includes site assessment and delineation will be submitted under separate cover with the permit application.

8.0 SUMMARY

The hydrogeologic properties of the geologic formations present at the site were characterized. Nine (9) new groundwater piezometers (BLE-1 through BLE-9) were installed and one (1) soil boring was performed at the site. Depth to groundwater measurements were collected in April and May 2023, and February, March and April 2024 from the nine (9) new groundwater piezometers and seven (7) existing groundwater monitoring wells. A groundwater elevation contour map using the March 27, 2024 groundwater elevation data, a composite seasonal high groundwater elevation map utilizing the highest recorded elevation in each well and piezometer during the 2024 study period, and an inferred top of rock (auger refusal) elevation contour map were prepared to be utilized by Browne for design and permitting efforts.

A geologist from BLE performed site visits and vehicular reconnaissance of the area surrounding the site. An evaluation of location restrictions from ADEM Permit Regulations Chapter 335-13-4-.01 [Landfill Unit Siting Standards] was performed.

We understand that a Phase I Cultural Resources Survey prepared by TerraXplorations, Inc. dated April 2024 will be submitted under separate cover with the permit application. If additional detailed wetland, endangered species, and archeological evaluations of the site are required, they will need to be performed by other consultants contracted by Chambers County Landfill, LLC.

9.0 QUALIFICATIONS OF REPORT

The activities and evaluative approaches used in this scope of work are consistent with those normally employed for services of this type. Our services have been performed based on our understanding of the site and the observations made during our work.

This report has been prepared on behalf of and exclusively for the use of Chambers County Landfill, LLC and Browne and Company, LLC. This report and the findings contained herein shall not, in whole or in part, be used or relied upon by any other party (excluding ADEM) without BLE's prior written consent.

10.0 REFERENCES

Alabama Department of Environmental Management, Land Division – Solid Waste Program, Landfill Unit Siting Standards, Chapter 335-13-4-.01, Revised Effective: April 3, 2012.

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*Limited Hydrogeologic Assessment
Chambers County Landfill – Lanett, Alabama*

*May 9, 2024
BLE Project No. J23-18020-02*

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Tables

TABLE 1

MONITORING WELL, PIEZOMETER, AND BORING SURVEY INFORMATION
Chambers County Landfill
Lanett, Alabama
Permit No. 09-02
BLE Project Number J23-18020-02

| Piezometer/ Well | Ground Elevation | TOC Elevation | Northing | Easting | Area Monitored | Status as of May 2024 |
|-----------------------------|-----------------------------|--------------------------|-----------------|----------------|---------------------------|----------------------------------|
| MW-3R | 725.51 | 728.27 | 854817.38 | 825635.74 | Chambers County LF | Present |
| MW-5R | 686.63 | 690.42 | 853917.73 | 824054.14 | Old Lanett LF | Present |
| MW-6R | 677.46 | 680.59 | 853946.34 | 823615.66 | Old Lanett LF | Present |
| MW-7R | 700.42 | 703.10 | 854947.33 | 823676.28 | Old Lanett LF | Present |
| MW-8 | 761.74 | 762.09 | 855581.60 | 824947.72 | Chambers County LF | Present |
| MW-9 | 718.96 | 720.56 | 856143.53 | 825737.65 | Chambers County LF | Present |
| MW-10 | 725.92 | 727.54 | 856527.55 | 825631.11 | Chambers County LF | Present |
| BLE-1 | 698.57 | 701.82 | 856751.83 | 823884.85 | West Expansion | Present |
| BLE-2 | 697.41 | 700.71 | 856077.74 | 823758.06 | West Expansion | Present |
| BLE-3 | 725.72 | 728.99 | 855358.60 | 824164.26 | West Expansion | Present |
| BLE-4 | 740.63 | 743.89 | 856741.24 | 825343.43 | Northeast Expansion | Present |
| BLE-5 | 760.93 | 764.45 | 856983.08 | 826358.86 | Northeast Expansion | Present |
| BLE-6 | 751.99 | 755.52 | 857287.65 | 825626.16 | Northeast Expansion | Present |
| BLE-7 | 733.06 | 735.78 | 857466.33 | 825199.29 | Northeast Expansion | Present |
| BLE-8 | 754.93 | 758.57 | 857930.71 | 825433.46 | Northeast Expansion | Present |
| BLE-9 | 763.47 | 766.72 | 857337.19 | 826124.91 | Northeast Expansion | Present |
| BLE-R1 | 763.51 | NA | 857012.57 | 826356.51 | Northeast Expansion | Abandoned |

NOTES:

1. Elevations are in FEET and reference the North American Vertical Datum of 1988 (NAVD 88)
2. Northings and Eastings are in FEET and are referenced to the State Plane Coordinate System Zone 0101 (Alabama East) and the North American Datum of 1983 (NAD 83).
3. TOC = *Top Of Casing*
4. NA = Not Applicable
5. **Bold wells and piezometers** are either in (or very close to) an expansion area
6. Existing MWs, BLE-1 through BLE-9, and BLE-R1 were surveyed by Wellston Associates Land Surveyors, LLC of Warner Robins, Georgia in May 2023.

TABLE 2

MONITORING WELL AND PIEZOMETER CONSTRUCTION DETAILS

Chambers County Landfill

Lanett, Alabama

Permit No. 09-02

BLE Project Number J23-18020-02

| Piezometer/ Well | Ground Elev. | TOC Elev. | Auger Refusal Depth | Auger Refusal Elev. | Well Depth | Screened Interval Depth | | Screened Interval Elevation | |
|-----------------------------|-------------------------|----------------------|--------------------------------|--------------------------------|-----------------------|------------------------------------|--------|--|---------|
| MW-3R | 725.51 | 728.27 | DNA | DNA | 39.13 | DNA | - DNA | DNA | - DNA |
| MW-5R | 686.63 | 690.42 | DNA | DNA | 23.87 | DNA | - DNA | DNA | - DNA |
| MW-6R | 677.46 | 680.59 | DNA | DNA | 20.09 | DNA | - DNA | DNA | - DNA |
| MW-7R | 700.42 | 703.10 | DNA | DNA | 15.00 | DNA | - DNA | DNA | - DNA |
| MW-8 | 761.74 | 762.09 | DNA | DNA | 68.55 | DNA | - DNA | DNA | - DNA |
| MW-9 | 718.96 | 720.56 | DNA | DNA | 17.66 | DNA | - DNA | DNA | - DNA |
| MW-10 | 725.92 | 727.54 | DNA | DNA | 38.01 | DNA | - DNA | DNA | - DNA |
| BLE-1 | 698.57 | 701.82 | >20.5 | <678.1 | 20.5 | 10.3 | - 20.3 | 688.3 | - 678.3 |
| BLE-2 | 697.41 | 700.71 | >22.4 | <675.0 | 22.4 | 12.2 | - 22.2 | 685.2 | - 675.2 |
| BLE-3 | 725.72 | 728.99 | 28.0 | 697.7 | 28.0 | 17.5 | - 27.5 | 708.2 | - 698.2 |
| BLE-4 | 740.63 | 743.89 | >27.5 | <713.1 | 27.5 | 17.2 | - 27.2 | 723.4 | - 713.4 |
| BLE-5 | 760.93 | 764.45 | 34.5 | 726.4 | 34.5 | 28.0 | - 33.0 | 732.9 | - 727.9 |
| BLE-6 | 751.99 | 755.52 | 34.0 | 718.0 | 34.0 | 23.7 | - 33.7 | 728.3 | - 718.3 |
| BLE-7 | 733.06 | 735.78 | >28.5 | <704.6 | 28.5 | 18.1 | - 28.1 | 714.9 | - 704.9 |
| BLE-8 | 754.93 | 758.57 | >46.0 | <708.9 | 46.0 | 35.8 | - 45.8 | 719.1 | - 709.1 |
| BLE-9 | 763.47 | 766.72 | 46.6 | 716.9 | 46.6 | 30.4 | - 40.4 | 733.0 | - 723.0 |
| BLE-R1 | 763.51 | NA | 29.0 | 734.5 | NA | NA | - NA | NA | - NA |

NOTES:

1. Elevations are in FEET and reference the North American Vertical Datum of 1988 (NAVD 88)
2. TOC = *Top Of Casing*
3. Depths are in FEET below ground surface
4. **Bold wells and piezometers** are either in (or very close to) the expansion areas
5. DNA = Data Not Available
6. Existing groundwater monitoring wells were tagged for total depth by BLE as part of this assessment

TABLE 3
GROUNDWATER ELEVATION DATA
Chambers County Landfill
Lanett, Alabama
Permit No. 09-02
BLE Project Number J23-18020-02

| Piezometer/ Well | Ground Elevation | TOC Elevation | Groundwater Elevations | | | | | | | | 2024 Maximum Elevation | 2024 Groundwater Elevations | | | Piezometer/ Well |
|---------------------|---------------------|------------------|------------------------|---------|---------|--------|---------|---------|---------|---------|------------------------------|--------------------------------|----------------------|--------------------|---------------------|
| | | | 2023 | | 2024 | | | | | | | Maximum Elevation | Minimum Elevation | Head Difference | |
| | | | 4/26/23 | 5/24/23 | 2/20/24 | 3/7/24 | 3/27/24 | 4/10/24 | 4/17/24 | 4/23/24 | | | | | |
| MW-3R | 725.51 | 728.27 | 705.13 | 704.29 | 704.66 | 704.62 | 705.97 | 704.89 | NM | 704.65 | 705.97 | 705.97 | 704.62 | 1.35 | MW-3R |
| MW-5R | 686.63 | 690.42 | 685.15 | 685.25 | 685.16 | 686.03 | 686.15 | 685.48 | NM | 685.30 | 686.15 | 686.15 | 685.16 | 0.99 | MW-5R |
| MW-6R | 677.46 | 680.59 | 671.79 | 672.51 | 672.20 | 672.41 | 672.27 | 672.38 | NM | 672.12 | 672.41 | 672.41 | 672.12 | 0.29 | MW-6R |
| MW-7R | 700.42 | 703.10 | 694.26 | 694.36 | 695.47 | 696.53 | 696.55 | 695.67 | NM | 695.82 | 696.55 | 696.55 | 695.47 | 1.08 | MW-7R |
| MW-8 | 761.74 | 762.09 | 712.11 | 717.24 | 716.81 | 716.85 | 716.89 | 716.89 | NM | 716.98 | 716.98 | 716.98 | 716.81 | 0.17 | MW-8 |
| MW-9 | 718.96 | 720.56 | 715.66 | 716.52 | 715.54 | 716.41 | 716.10 | 715.77 | NM | 715.91 | 716.41 | 716.41 | 715.54 | 0.87 | MW-9 |
| MW-10 | 725.92 | 727.54 | 722.19 | 723.51 | 722.58 | 722.76 | 722.96 | 722.40 | NM | 722.45 | 722.96 | 722.96 | 722.40 | 0.56 | MW-10 |
| BLE-1 | 698.57 | 701.82 | 694.36 | 695.78 | 695.17 | 693.97 | 695.44 | 695.12 | 695.03 | 695.35 | 695.44 | 695.44 | 693.97 | 1.47 | BLE-1 |
| BLE-2 | 697.41 | 700.71 | 690.16 | 690.67 | 691.64 | 692.11 | 691.95 | 691.06 | 691.20 | 691.28 | 692.11 | 692.11 | 691.06 | 1.05 | BLE-2 |
| BLE-3 | 725.72 | 728.99 | 702.89 | 702.63 | 701.57 | 702.08 | 702.96 | 703.05 | 703.08 | 702.95 | 703.08 | 703.08 | 701.57 | 1.51 | BLE-3 |
| BLE-4 | 740.63 | 743.89 | 727.34 | 727.24 | 727.73 | 727.72 | 728.14 | 727.68 | 727.69 | 727.55 | 728.14 | 728.14 | 727.55 | 0.59 | BLE-4 |
| BLE-5 | 760.93 | 764.45 | 728.98 | 729.47 | 728.65 | 729.04 | 729.83 | 730.29 | 730.45 | 730.45 | 730.45 | 730.45 | 728.65 | 1.80 | BLE-5 |
| BLE-6 | 751.99 | 755.52 | 729.32 | 729.72 | 728.16 | 728.72 | 729.53 | 729.95 | 730.09 | 730.08 | 730.09 | 730.09 | 728.16 | 1.93 | BLE-6 |
| BLE-7 | 733.06 | 735.78 | 725.95 | 726.05 | 725.65 | 725.96 | 726.35 | 726.34 | 726.32 | 726.29 | 726.35 | 726.35 | 725.65 | 0.70 | BLE-7 |
| BLE-8 | 754.93 | 758.57 | 722.13 | 722.61 | 721.62 | 721.84 | 722.22 | 722.55 | 722.55 | 722.67 | 722.71 | 722.71 | 721.62 | 1.09 | BLE-8 |
| BLE-9 | 763.47 | 766.72 | 733.14 | 733.42 | 732.54 | 733.10 | 734.19 | 734.46 | 734.56 | 734.46 | 734.56 | 734.56 | 732.54 | 2.02 | BLE-9 |

| Piezometer/ Well | Ground Elevation | TOC Elevation | Depth to Groundwater | | | | | | | |
|---------------------|---------------------|------------------|----------------------|---------|---------|--------|---------|---------|---------|---------|
| | | | 2023 | | 2024 | | | | | |
| | | | 4/26/23 | 5/24/23 | 2/20/24 | 3/7/24 | 3/27/24 | 4/10/24 | 4/17/24 | 4/23/24 |
| MW-3R | 725.51 | 728.27 | 20.38 | 21.22 | 20.85 | 20.89 | 19.54 | 20.62 | NM | 20.86 |
| MW-5R | 686.63 | 690.42 | 1.48 | 1.38 | 1.47 | 0.60 | 0.48 | 1.15 | NM | 1.33 |
| MW-6R | 677.46 | 680.59 | 5.67 | 4.95 | 5.26 | 5.05 | 5.19 | 5.08 | NM | 5.34 |
| MW-7R | 700.42 | 703.10 | 6.16 | 6.06 | 4.95 | 3.89 | 3.87 | 4.75 | NM | 4.60 |
| MW-8 | 761.74 | 762.09 | 49.63 | 44.50 | 44.93 | 44.89 | 44.85 | 44.85 | NM | 44.76 |
| MW-9 | 718.96 | 720.56 | 3.30 | 2.44 | 3.42 | 2.55 | 2.86 | 3.19 | NM | 3.05 |
| MW-10 | 725.92 | 727.54 | 3.73 | 2.41 | 3.34 | 3.16 | 2.96 | 3.52 | NM | 3.47 |
| BLE-1 | 698.57 | 701.82 | 4.21 | 2.79 | 3.40 | 4.60 | 3.13 | 3.45 | 3.54 | 3.22 |
| BLE-2 | 697.41 | 700.71 | 7.25 | 6.74 | 5.77 | 5.30 | 5.46 | 6.35 | 6.21 | 6.13 |
| BLE-3 | 725.72 | 728.99 | 22.83 | 23.09 | 24.15 | 23.64 | 22.76 | 22.67 | 22.64 | 22.77 |
| BLE-4 | 740.63 | 743.89 | 13.29 | 13.39 | 12.90 | 12.91 | 12.49 | 12.95 | 12.94 | 13.08 |
| BLE-5 | 760.93 | 764.45 | 31.95 | 31.46 | 32.28 | 31.89 | 31.10 | 30.64 | 30.48 | 30.48 |
| BLE-6 | 751.99 | 755.52 | 22.67 | 22.27 | 23.83 | 23.27 | 22.46 | 22.04 | 21.90 | 21.91 |
| BLE-7 | 733.06 | 735.78 | 7.11 | 7.01 | 7.41 | 7.10 | 6.71 | 6.72 | 6.74 | 6.77 |
| BLE-8 | 754.93 | 758.57 | 32.80 | 32.32 | 33.31 | 33.09 | 32.71 | 32.38 | 32.22 | 32.26 |
| BLE-9 | 763.47 | 766.72 | 30.33 | 30.05 | 30.93 | 30.37 | 29.28 | 29.01 | 28.91 | 29.01 |

- NOTES:**
1. Elevations are in FEET and reference the North American Vertical Datum of 1988 (NAVD 88); depths are in FEET.
 2. TOC = *Top Of Casing*
 3. NP = *Not Present*
 4. NM= *Not Measured*
 4. Shaded water levels represent the highest water level measurement in each well/piezometer between July 2022 and April 2024.
 5. **Bold wells and piezometers** are either in (or very close to) the expansion areas.

TABLE 4**SUMMARY OF IN-SITU HYDRAULIC TESTING - SLUG TEST RESULTS****Chambers County Landfill****Lanett, Alabama****Permit No. 09-02****BLE Project Number J23-18020-02**

| Piezometer/ Well | Method | Data Type | Aquifer Unit | Hydraulic Conductivity (K) | | |
|---------------------|---------------------------------------|--------------|--------------|----------------------------|----------|--------|
| | | | | ft/min | cm/sec | ft/day |
| BLE-2 | Bouwer-Rice | Falling Head | Residuum | 3.01E-03 | 1.53E-03 | 4.33 |
| BLE-2 | Bouwer-Rice | Rising Head | Residuum | 2.93E-03 | 1.49E-03 | 4.22 |
| BLE-4 | Bouwer-Rice | Falling Head | Residuum | 3.07E-03 | 1.56E-03 | 4.42 |
| BLE-4 | Bouwer-Rice | Rising Head | Residuum | 2.96E-03 | 1.50E-03 | 4.26 |
| BLE-6 | Bouwer-Rice | Falling Head | Residuum | 1.83E-03 | 9.30E-04 | 2.64 |
| BLE-6 | Bouwer-Rice | Rising Head | Residuum | 1.96E-03 | 9.97E-04 | 2.82 |
| BLE-7 | Bouwer-Rice | Falling Head | Residuum | 1.99E-03 | 1.01E-03 | 2.86 |
| BLE-7 | Bouwer-Rice | Rising Head | Residuum | 1.35E-03 | 6.85E-04 | 1.94 |
| | | | | | | |
| Residuum | Maximum Hydraulic Conductivity | | | 3.07E-03 | 1.56E-03 | 4.42 |
| | Geometric Mean Hydraulic Conductivity | | | 2.30E-03 | 1.17E-03 | 3.31 |
| | Minimum Hydraulic Conductivity | | | 1.35E-03 | 6.85E-04 | 1.94 |

NOTES:

1. K = *Hydraulic Conductivity*
2. The data was reduced and the hydraulic conductivities calculated using SuperSlug Version 3.2.
3. Residuum = SM, ML

TABLE 5

GROUNDWATER SEEPAGE VELOCITY CALCULATIONS
Chambers County Landfill
Lanett, Alabama
Permit No. 09-02
BLE Project Number J23-18020-02

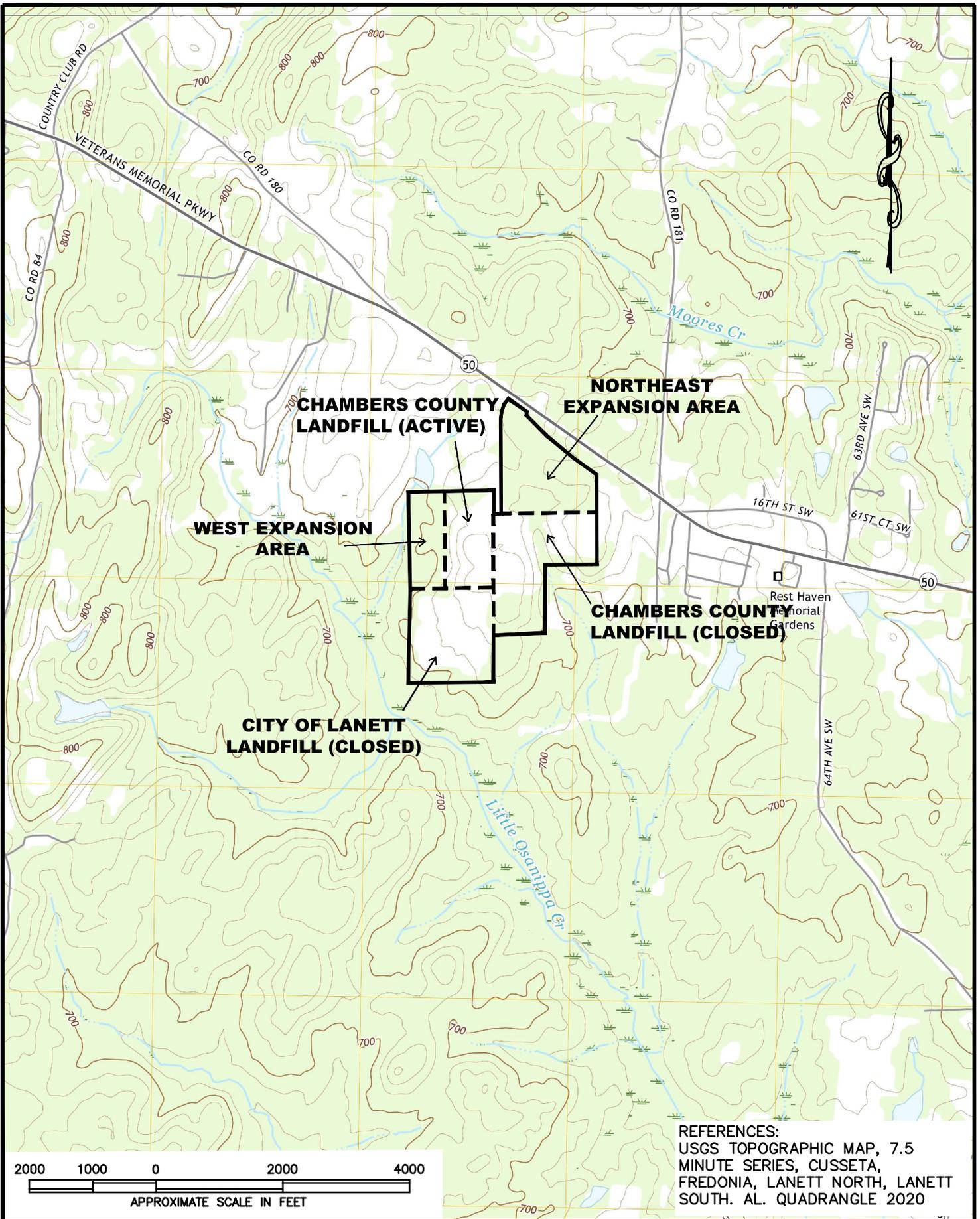
| Geologic Unit | | Hydraulic Conductivity | | | Effective Porosity (n_e) |
|---------------|-----------------------|------------------------|-----------------|-------------|------------------------------|
| | | K (ft/min) | K (cm/sec) | K (ft/day) | Unitless |
| Residuum | High Estimate | 3.07E-03 | 1.56E-03 | 4.42 | 0.46 |
| | Low Estimate | 1.35E-03 | 6.85E-04 | 1.94 | 0.01 |
| | Geometric Mean | 2.30E-03 | 1.17E-03 | 3.31 | 0.07 |

| | | Geometric Mean Hydraulic Conductivity K(ft/day) | Hydraulic Gradient (ft/ft) | Geometric Mean Effective Porosity (n_e) | Flow Velocity (ft/day) | Flow Velocity (ft/year) |
|----------|----------------|---|----------------------------|---|------------------------|-------------------------|
| Residuum | High Estimate | 3.31 | 0.056 | 0.07 | 2.71 | 988 |
| | Geometric Mean | | 0.025 | | 1.22 | 447 |
| | Low Estimate | | 0.011 | | 0.55 | 202 |

Notes:

- Groundwater Flow Velocity is derived from $V = Ki/n_e$ where:
 V = Groundwater Flow Velocity, K = Hydraulic Conductivity, i = Hydraulic Gradient, and n_e = Effective Porosity.
- The hydraulic conductivity values are from slug tests (**Table 4**).
- Effective porosity values in the Residuum (silty fine to coarse sand) are from published values (1 to 46 percent) (McWhorter, D.B. and Sunada, D.K., 1977).
- Hydraulic gradient information is from the March 27, 2024 Groundwater Elevation Contour Map (**Figure 4**).
 The highest hydraulic gradient measured across the facility is measured between the 690-ft to 700-ft contours near BLE-1.
 The lowest hydraulic gradient measured across the facility is measured between the 725-ft to 730-ft contours between BLE-6 and BLE-8.

Figures



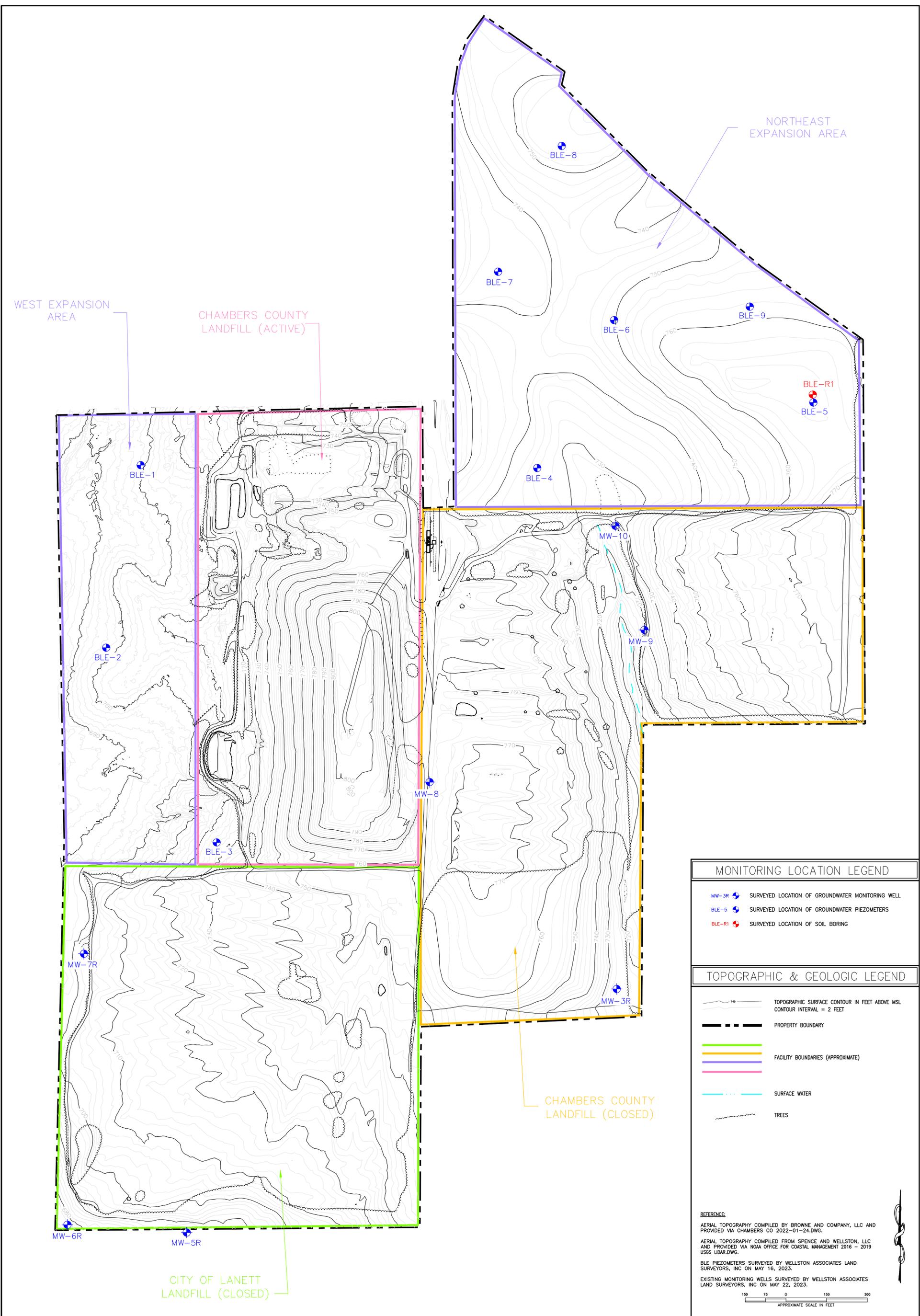
REFERENCES:
 USGS TOPOGRAPHIC MAP, 7.5
 MINUTE SERIES, CUSSETA,
 FREDONIA, LANETT NORTH, LANETT
 SOUTH. AL. QUADRANGLE 2020



| | |
|---------------|----------------------|
| DRAWN: ZJD | DATE: 5-15-23 |
| CHECKED: TAO | CAD: CHAMBERS-02SLM |
| APPROVED: AWA | JOB NO: J23-18020-02 |

BLE | **BUNNELL
 LAMMONS
 ENGINEERING**
 6004 Ponders Court, Greenville, SC 29615
 Phone: (864) 288-1265 Fax: (864) 288-4430

SITE LOCATION MAP
 CHAMBERS COUNTY LANDFILL
 LANETT, ALABAMA



MONITORING LOCATION LEGEND

- MW-3R SURVEYED LOCATION OF GROUNDWATER MONITORING WELL
- BLE-5 SURVEYED LOCATION OF GROUNDWATER PIEZOMETERS
- BLE-R1 SURVEYED LOCATION OF SOIL BORING

TOPOGRAPHIC & GEOLOGIC LEGEND

- TOPOGRAPHIC SURFACE CONTOUR IN FEET ABOVE MSL. CONTOUR INTERVAL = 2 FEET
- PROPERTY BOUNDARY
- FACILITY BOUNDARIES (APPROXIMATE)
- SURFACE WATER
- TREES

REFERENCE:
 AERIAL TOPOGRAPHY COMPILED BY BROWNE AND COMPANY, LLC AND PROVIDED VIA CHAMBERS CO 2022-01-24.DWG.
 AERIAL TOPOGRAPHY COMPILED FROM SPENCE AND WELLSTON, LLC AND PROVIDED VIA NOAA OFFICE FOR COASTAL MANAGEMENT 2016 - 2019 USGS LIDAR.DWG.
 BLE PIEZOMETERS SURVEYED BY WELLSTON ASSOCIATES LAND SURVEYORS, INC ON MAY 16, 2023.
 EXISTING MONITORING WELLS SURVEYED BY WELLSTON ASSOCIATES LAND SURVEYORS, INC ON MAY 22, 2023.

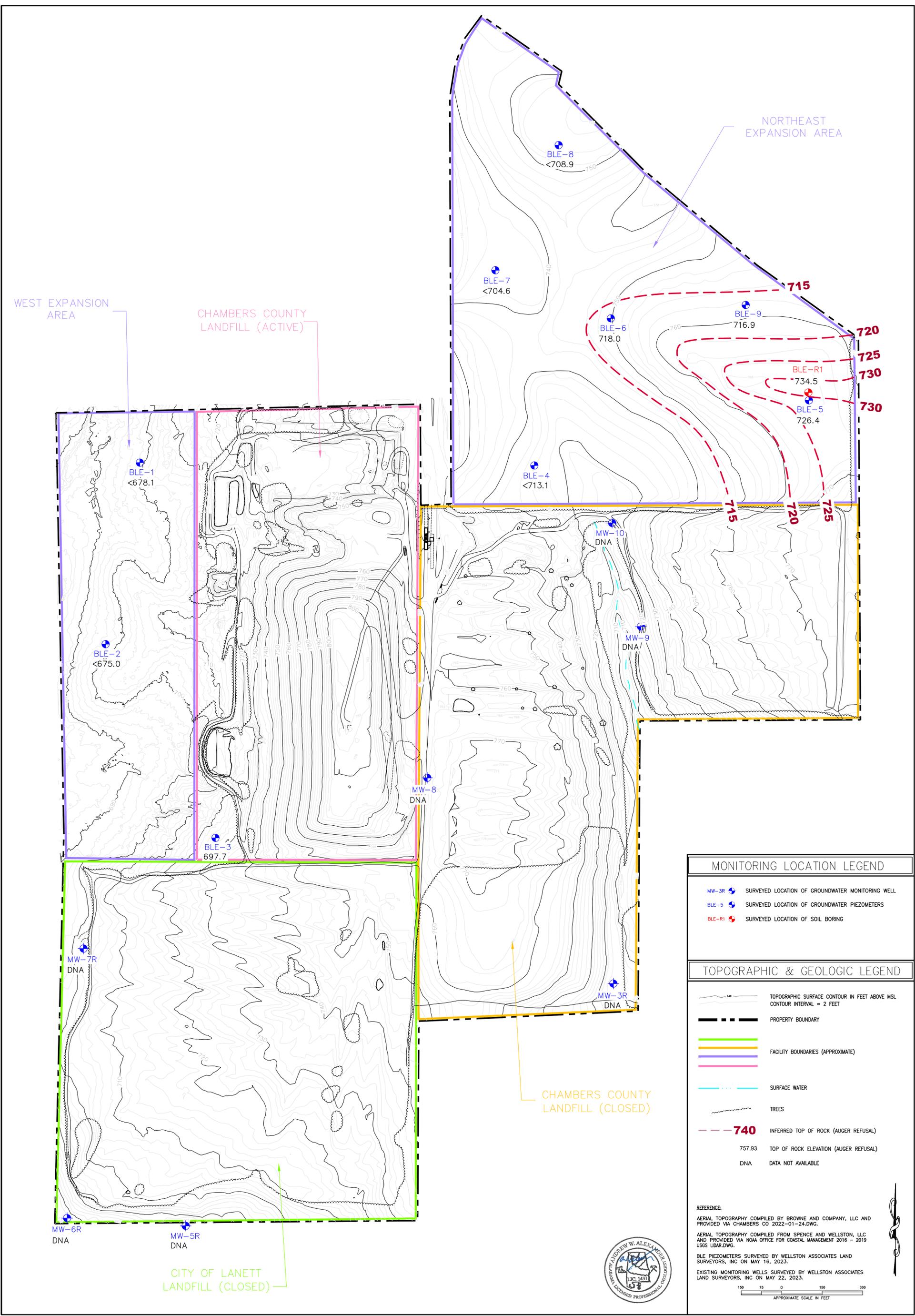
150 75 0 150 300
 APPROXIMATE SCALE IN FEET

| REVISIONS | | BY |
|-----------|-------------|----|
| No. | DESCRIPTION | |
| 1 | | |
| 2 | | |

| | |
|----------------------|-----------------------------|
| DRAWN: ZJD | DATE: 5-25-23 |
| CHECKED: TAO | FILE: CHAMBERS-02BLP |
| APPROVED: AWA | JOB NO: J23-18020-02 |

BLE | BUNNELL LAMMONS ENGINEERING
 6004 Ponders Court, Greenville, SC 29615
 Phone: (864) 288-1265 Fax: (864) 288-4430

SITE TOPOGRAPHY AND BORING LOCATION PLAN
 CHAMBERS COUNTY LANDFILL
 LANETT, ALABAMA



MONITORING LOCATION LEGEND

- MW-3R SURVEYED LOCATION OF GROUNDWATER MONITORING WELL
- BLE-5 SURVEYED LOCATION OF GROUNDWATER PIEZOMETERS
- BLE-R1 SURVEYED LOCATION OF SOIL BORING

TOPOGRAPHIC & GEOLOGIC LEGEND

- TOPOGRAPHIC SURFACE CONTOUR IN FEET ABOVE MSL. CONTOUR INTERVAL = 2 FEET
- PROPERTY BOUNDARY
- FACILITY BOUNDARIES (APPROXIMATE)
- SURFACE WATER
- TREES
- 740** INFERRED TOP OF ROCK (AUGER REFUSAL)
- 757.93 TOP OF ROCK ELEVATION (AUGER REFUSAL)
- DNA DATA NOT AVAILABLE

REFERENCE:
 AERIAL TOPOGRAPHY COMPILED BY BROWNE AND COMPANY, LLC AND PROVIDED VIA CHAMBERS CO 2022-01-24.DWG.
 AERIAL TOPOGRAPHY COMPILED FROM SPENCE AND WELLSTON, LLC AND PROVIDED VIA NOAA OFFICE FOR COASTAL MANAGEMENT 2016 - 2019 USGS LIDAR.DWG.
 BLE PIEZOMETERS SURVEYED BY WELLSTON ASSOCIATES LAND SURVEYORS, INC ON MAY 16, 2023.
 EXISTING MONITORING WELLS SURVEYED BY WELLSTON ASSOCIATES LAND SURVEYORS, INC ON MAY 22, 2023.

ANDREW W. ALEXANDER
 LICENSED PROFESSIONAL ENGINEER

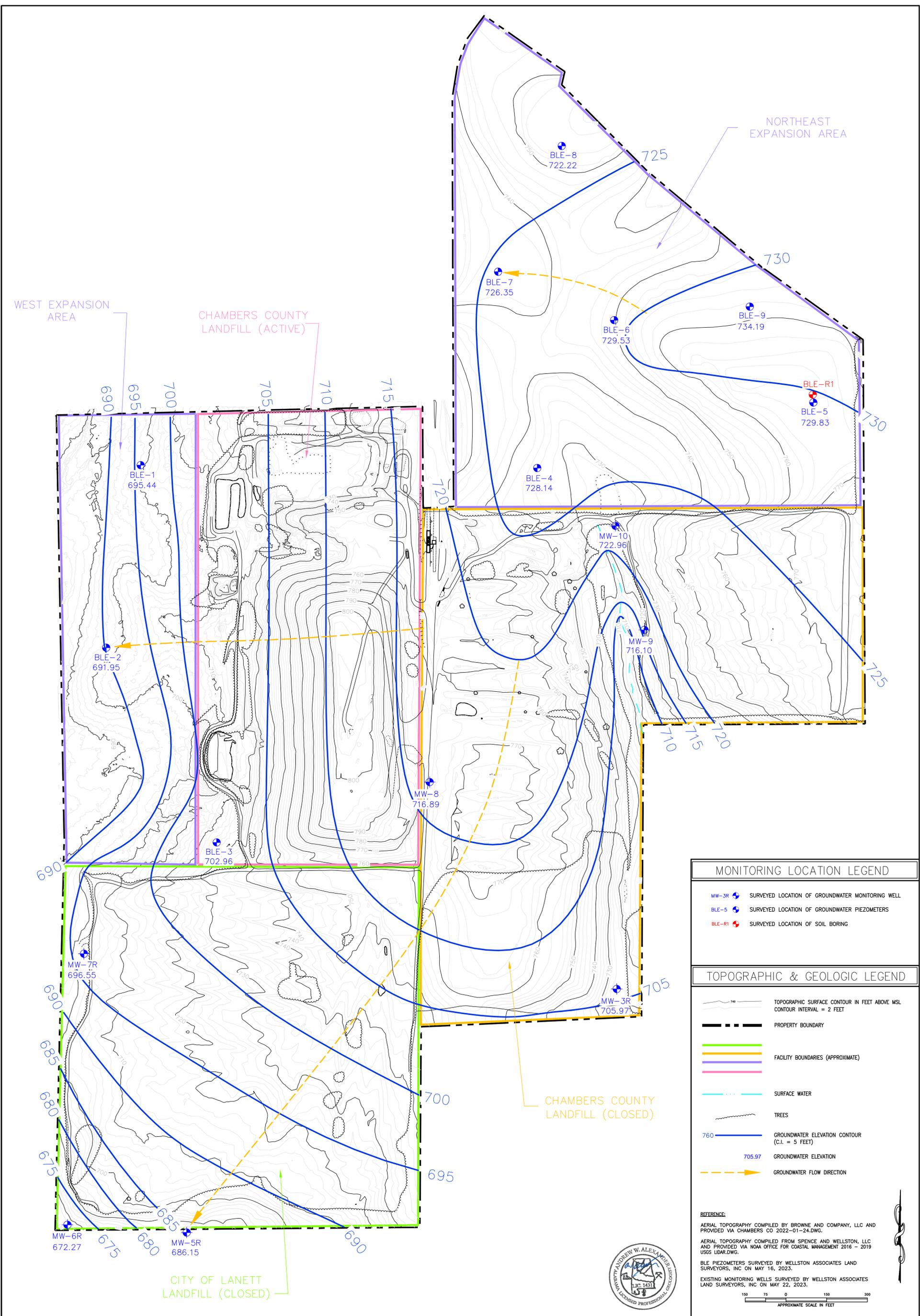
APPROXIMATE SCALE IN FEET

| REVISIONS | | BY |
|-----------|-------------|----|
| No. | DESCRIPTION | |
| 1 | | |
| 2 | | |

| | |
|----------------------|---------------------------------|
| DRAWN: ZJD | DATE: 5-30-23 |
| CHECKED: AWA | FILE: CHAMBERS-02BEDROCK |
| APPROVED: AWA | JOB NO: J23-18020-02 |

BLE BUNNELL LAMMONS ENGINEERING
 6004 Ponders Court, Greenville, SC 29615
 Phone: (864) 288-1265 Fax: (864) 288-4430

INFERRED TOP OF ROCK (AUGER REFUSAL) ELEVATION CONTOUR MAP
 CHAMBERS COUNTY LANDFILL
 LANETT, ALABAMA



| MONITORING LOCATION LEGEND | |
|----------------------------|--|
| MW-3R | SURVEYED LOCATION OF GROUNDWATER MONITORING WELL |
| BLE-5 | SURVEYED LOCATION OF GROUNDWATER PIEZOMETERS |
| BLE-R1 | SURVEYED LOCATION OF SOIL BORING |

| TOPOGRAPHIC & GEOLOGIC LEGEND | |
|-------------------------------|--|
| | TOPOGRAPHIC SURFACE CONTOUR IN FEET ABOVE MSL CONTOUR INTERVAL = 2 FEET |
| | PROPERTY BOUNDARY |
| | FACILITY BOUNDARIES (APPROXIMATE) |
| | SURFACE WATER |
| | TREES |
| | GROUNDWATER ELEVATION CONTOUR (C.I. = 5 FEET) |
| | GROUNDWATER ELEVATION |
| | GROUNDWATER FLOW DIRECTION |

REFERENCE:
 AERIAL TOPOGRAPHY COMPILED BY BROWNE AND COMPANY, LLC AND PROVIDED VIA CHAMBERS CO 2022-01-24.DWG.
 AERIAL TOPOGRAPHY COMPILED FROM SPENCE AND WELLSTON, LLC AND PROVIDED VIA NOAA OFFICE FOR COASTAL MANAGEMENT 2016 - 2019 USGS LIDAR.DWG.
 BLE PIEZOMETERS SURVEYED BY WELLSTON ASSOCIATES LAND SURVEYORS, INC ON MAY 16, 2023.
 EXISTING MONITORING WELLS SURVEYED BY WELLSTON ASSOCIATES LAND SURVEYORS, INC ON MAY 22, 2023.

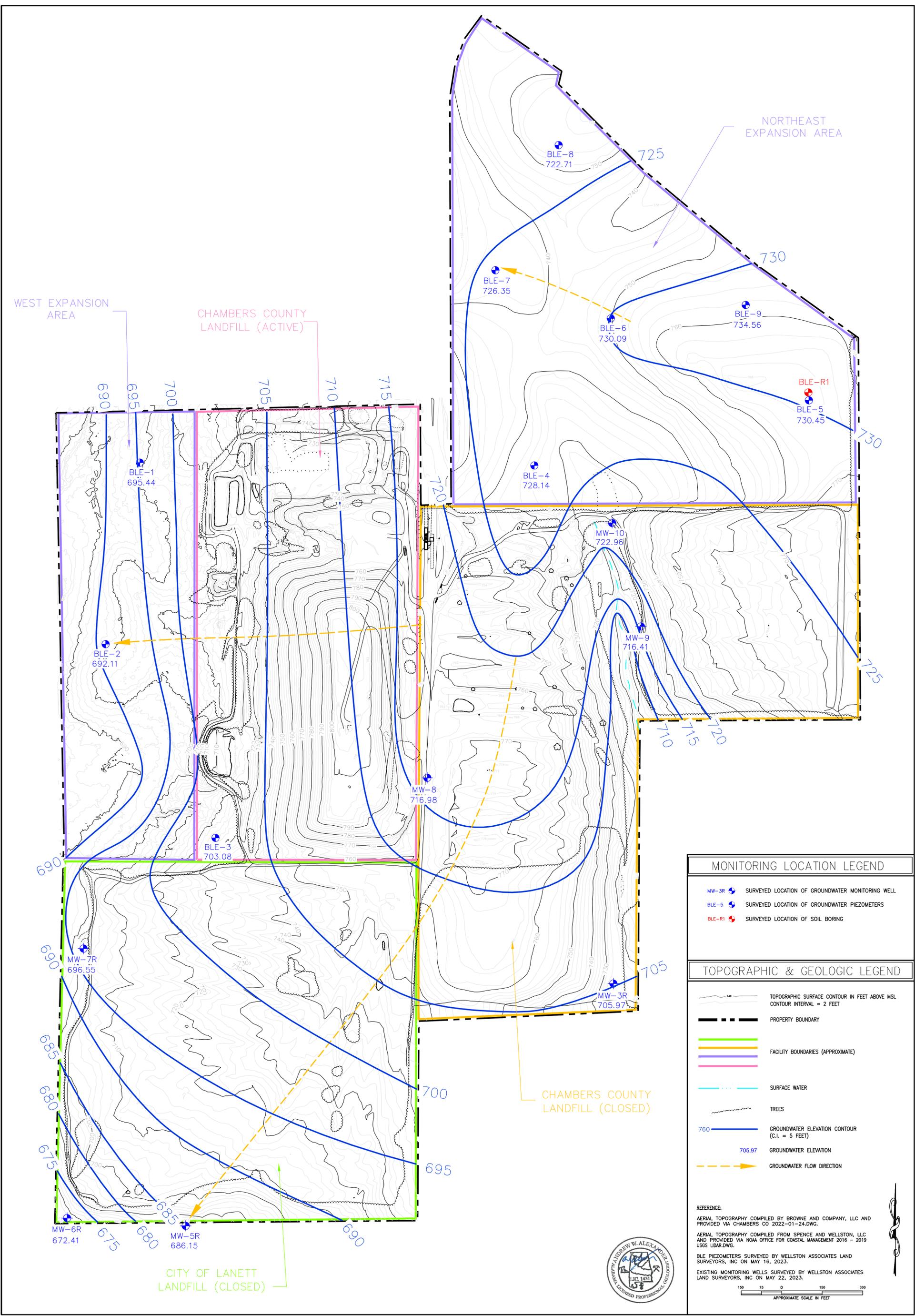
APPROXIMATE SCALE IN FEET

| REVISIONS | | |
|-----------|-------------|----|
| No. | DESCRIPTION | BY |
| 1 | | |
| 2 | | |

| | |
|----------------------|-----------------------------|
| DRAWN: ZJD | DATE: 4-19-24 |
| CHECKED: TAO | FILE: CHAMBERS-02WTM |
| APPROVED: AWA | JOB NO: J23-18020-02 |

BLE BUNNELL LAMMONS ENGINEERING
 6004 Ponders Court, Greenville, SC 29615
 Phone: (864) 288-1265 Fax: (864) 288-4430

GROUNDWATER ELEVATION CONTOUR MAP - MARCH 27, 2024
 CHAMBERS COUNTY LANDFILL
 LANETT, ALABAMA



MONITORING LOCATION LEGEND

- MW-3R SURVEYED LOCATION OF GROUNDWATER MONITORING WELL
- BLE-5 SURVEYED LOCATION OF GROUNDWATER PIEZOMETERS
- BLE-R1 SURVEYED LOCATION OF SOIL BORING

TOPOGRAPHIC & GEOLOGIC LEGEND

- TOPOGRAPHIC SURFACE CONTOUR IN FEET ABOVE MSL. CONTOUR INTERVAL = 2 FEET
- PROPERTY BOUNDARY
- FACILITY BOUNDARIES (APPROXIMATE)
- SURFACE WATER
- TREES
- GROUNDWATER ELEVATION CONTOUR (C.I. = 5 FEET)
- GROUNDWATER ELEVATION
- GROUNDWATER FLOW DIRECTION

REFERENCE:
 AERIAL TOPOGRAPHY COMPILED BY BROWNE AND COMPANY, LLC AND PROVIDED VIA CHAMBERS CO 2022-01-24.DWG.
 AERIAL TOPOGRAPHY COMPILED FROM SPENCE AND WELLSTON, LLC AND PROVIDED VIA NOAA OFFICE FOR COASTAL MANAGEMENT 2016 - 2019 USGS LIDAR.DWG.
 BLE PIEZOMETERS SURVEYED BY WELLSTON ASSOCIATES LAND SURVEYORS, INC ON MAY 16, 2023.
 EXISTING MONITORING WELLS SURVEYED BY WELLSTON ASSOCIATES LAND SURVEYORS, INC ON MAY 22, 2023.

ANDREW W. ALEXANDER
 LICENSED PROFESSIONAL ENGINEER

APPROXIMATE SCALE IN FEET

| REVISIONS | | BY |
|-----------|-------------|----|
| No. | DESCRIPTION | |
| 1 | | |
| 2 | | |

| | |
|----------------------|--------------------------------|
| DRAWN: ZJD | DATE: 4-18-24 |
| CHECKED: TAO | FILE: CHAMBERS-02SEASHI |
| APPROVED: AWA | JOB NO: J23-18020-02 |

BLE | **BUNNELL LAMMONS ENGINEERING**
 6004 Ponders Court, Greenville, SC 29615
 Phone: (864) 288-1265 Fax: (864) 288-4430

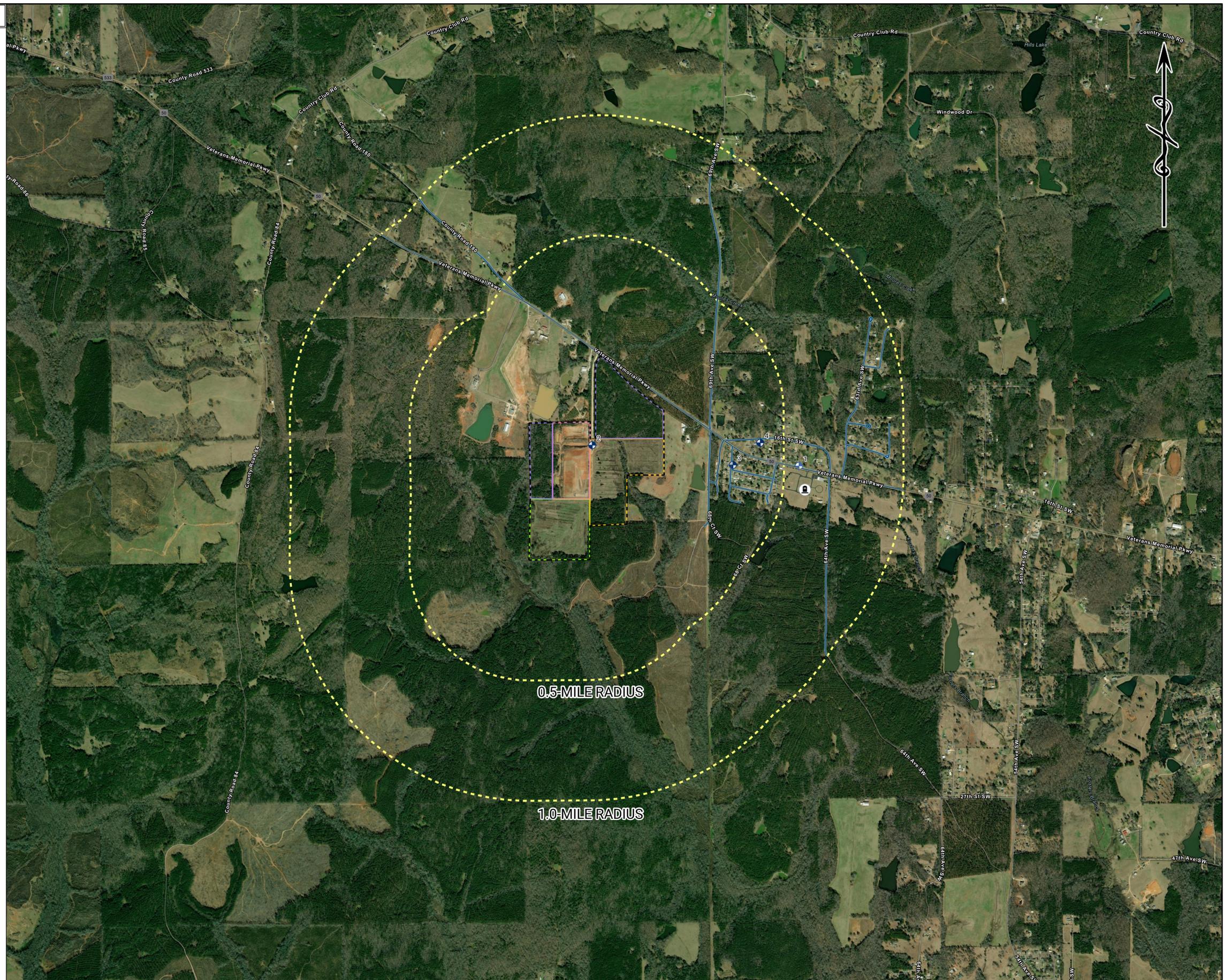
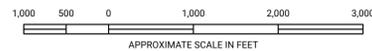
COMPOSITE SEASONAL HIGH GROUNDWATER ELEVATION CONTOUR MAP
 FEBRUARY THROUGH APRIL 2024
 CHAMBERS COUNTY LANDFILL
 LANETT, ALABAMA

SYMBOL LEGEND

-  PROPERTY BOUNDARY
-  NORTHEAST EXPANSION AREA
-  WEST EXPANSION AREA
-  CHAMBERS COUNTY LANDFILL (ACTIVE)
-  CHAMBERS COUNTY LANDFILL (CLOSED)
-  CITY OF LANETT LANDFILL (CLOSED)
-  0.5-MILE AND 1.0-MILE PERIMETER RADIUS AROUND LANDFILL PROPERTY
-  LANETT REGIONAL AIRPORT
(NOT WITHIN 10,000 FEET OF PROPERTY BOUNDARY)
-  CEMETERIES
-  ROADS WITHIN 1-MILE RADIUS WHERE MUNICIPAL WATER SUPPLY WAS OBSERVED
-  SUSPECTED PRIVATE DRINKING WATER WELL
1. APPARENT ABANDONED RESIDENCE
-  CONFIRMED PRIVATE DRINKING WATER WELL
2. CHAMBERS COUNTY LANDFILL (NOT USED FOR DRINKING WATER)
3. RESIDENCE WITH APPARENT PUBLIC WATER SYSTEM CONNECTION
4. RESIDENCE WITH APPARENT PUBLIC WATER SYSTEM CONNECTION

- NOTES:**
1. THIS DESKTOP AND VEHICULAR AREA RECONNAISSANCE WAS PERFORMED IN APRIL 2024.
 2. FOUR PRIVATE WELLS FOUND WITHIN ONE MILE OF THE SITE BOUNDARY.
 3. NO PUBLIC WATER SUPPLY WELLS, SURFACE INTAKES, OR SPRINGS FOUND WITHIN ONE MILE OF THE SITE BOUNDARY.
 4. NO PUBLIC USE AIRPORT RUNWAYS WITHIN 10,000 FEET OF THE SITE BOUNDARY.
 5. NO HOLOCENE EPOCH FAULTS LOCATED WITHIN 200 FEET OF THE SITE BOUNDARY.
 6. WATER IS SUPPLIED TO THE AREA ALONG THE PRIMARY ROADS BY THE CITY OF LANETT WATER AND SEWER DEPARTMENT.
 7. PRIVATE DRINKING WATER WELL LOCATIONS AND OTHER FEATURES ARE APPROXIMATE.

REFERENCES:
 SITE BOUNDARIES PROVIDED BY BROWNE AND COMPANY, LLC; AERIAL IMAGERY - MAXAR, 2/18/2023; ROADS - US CENSUS, TIGER (2023)



| REVISIONS | | BY |
|-----------|-------------|----|
| No. | DESCRIPTION | |
| | | |
| | | |

| | | | |
|--------------|-----|---------|----------------|
| DRAWN BY: | TAO | DATE: | 5-10-24 |
| CHECKED BY: | ZJD | FILE: | 18020-02 RECON |
| APPROVED BY: | AWA | JOB NO: | J23-18020-02 |




AREA RECONNAISSANCE MAP
 CHAMBERS COUNTY LANDFILL
 LANETT, ALABAMA

LEGEND

- ZONE A 1% ANNUAL CHANCE FLOOD HAZARD
- STREAM CENTERLINE
- PROPERTY BOUNDARY
- NORTHEAST EXPANSION AREA
- WEST EXPANSION AREA
- CHAMBERS COUNTY LANDFILL (ACTIVE)
- CHAMBERS COUNTY LANDFILL (CLOSED)
- CITY OF LANETT LANDFILL (CLOSED)

PANEL 0275C

FIRM

FLOOD INSURANCE RATE MAP

CHAMBERS COUNTY,
ALABAMA
AND INCORPORATED AREAS

PANEL 275 OF 425

(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)

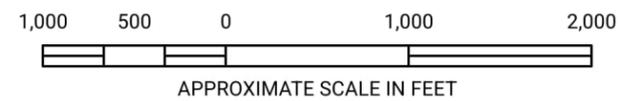
CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|-----------------|--------|-------|--------|
| CHAMBERS COUNTY | 010026 | 0275 | C |

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

| | |
|-------------------|-------------|
| EFFECTIVE DATE | MAP NUMBER |
| FEBRUARY 18, 2011 | 01017C0275C |

State of Alabama
Federal Emergency Management Agency



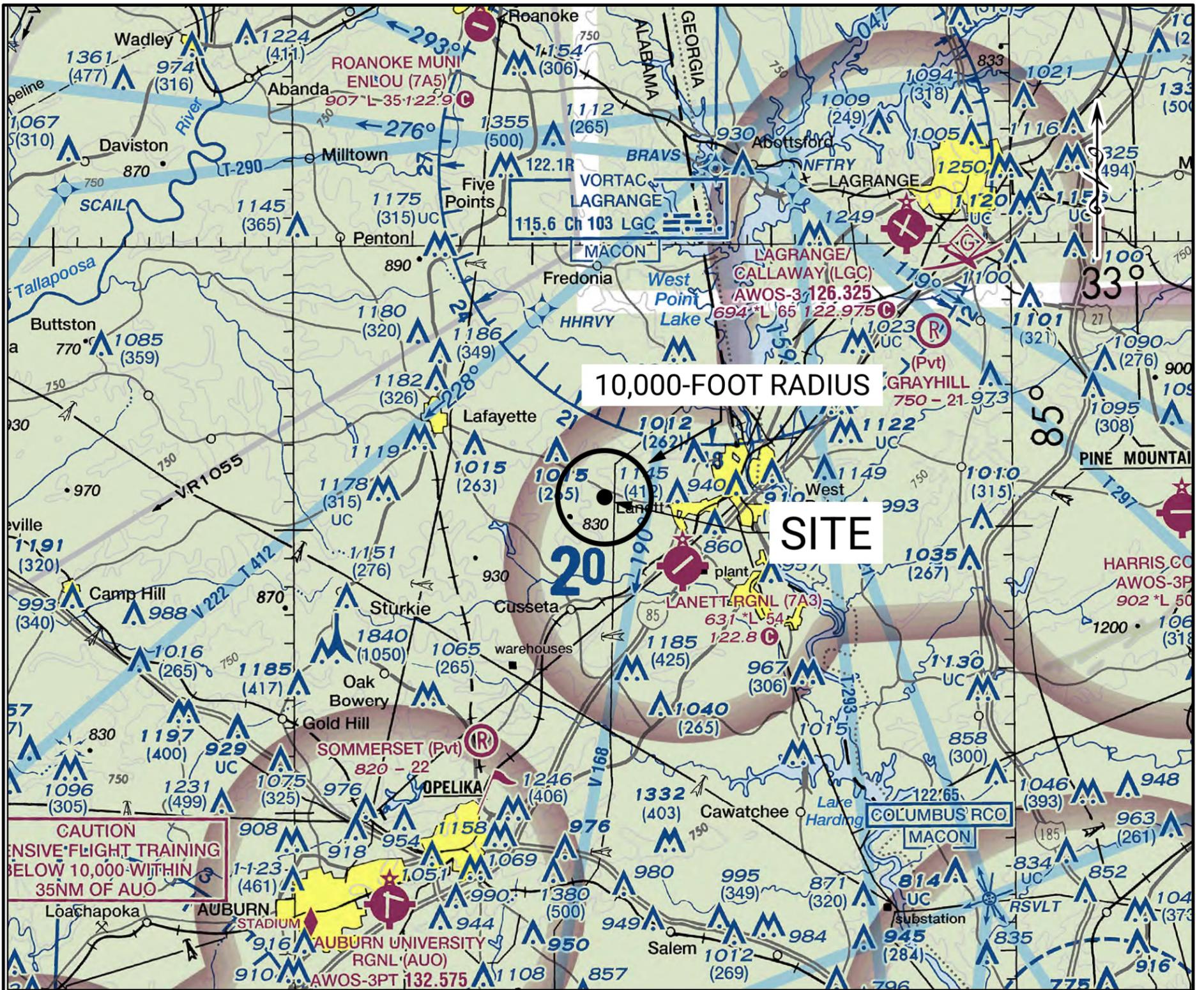
REFERENCES: AERIAL IMAGERY - MAXAR WORLD IMAGERY ACQUIRED 2/18/2023
FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) DIGITAL FLOOD INSURANCE RATE MAP

| | |
|------------------|---------------------------|
| DRAWN BY: TAO | DATE: 5-10-24 |
| CHECKED BY: ZJD | FILE NAME: 18020-02 FLOOD |
| APPROVED BY: AWA | JOB NO: J23-18020-02 |

| REVISIONS | | |
|-----------|-------------|----|
| No. | DESCRIPTION | BY |
| | | |
| | | |



FEMA 100-YEAR FLOODPLAIN MAP
CHAMBERS COUNTY LANDFILL
LANETT, ALABAMA



Airports having Control Towers are shown in Blue, all others in Magenta. Consult Chart Supplement for details involving airport lighting, navigation aids, and services. All times are local. For additional symbol information refer to the Chart User's Guide.

AIRPORTS

- Other than hard-surfaced runways
- Hard-surfaced runways 1500 ft. to 8069 ft. in length
- Hard-surfaced runways greater than 8069 ft. or some multiple runways less than 8069 ft.
- Open dot within hard-surfaced runway configuration indicates approximate VOR, VOR-DME, DME or VORTAC location.

ADDITIONAL AIRPORT INFORMATION

- Private (Pvt) - Non-public use having emergency or landmark value
- Military - Other than hard-surfaced; all military airports are identified by abbreviations AFB, NAS, AAF, etc.
- Helipad Selected
- Unverified
- Abandoned - paved having landmark value, 3000 ft. or greater
- Ultraflight Flight Park Selected

AIRPORT DATA

Box indicates FAR 93

Special Air Traffic Rules & Airport Traffic Patterns

Runways with CT - 118.3 * ATIS 123.8

Right Traffic Patterns (public use) RP 23, 34

*RP Special conditions exist - see Supplement.

FSS - Flight Service Station AOE - Airport of Entry

NO SVFR - Fixed-wing special VFR flight is prohibited.

CT - 118.3 - Control Tower (CT) - primary frequency

* - Star indicates operation part-time. See tower frequencies tabulation for hours of operation.

Ⓢ - Follows the Common Traffic Advisory Frequency (CTAF)

ATIS 123.8 - Automatic Terminal Information Service

AFIS 135.2 - Automatic Flight Information Service (AK)

ASOS/AWOS 135.42 - Automated Surface Weather Observing Systems (shown where full-time ATIS not available). Some ASOS/AWOS facilities may not be located at airports.

UNICOM - Aeronautical advisory station

VFR Advy - VFR Advisory Service shown where full-time ATIS not available and frequency is other than primary CT frequency.

285 - Elevation in feet

L - Lighting in operation Sunset to Sunrise

*L - Lighting limitations exist; refer to Supplement.

72 - Length of longest runway in hundreds of feet; usable length may be less.

When information is lacking, the respective character is replaced by a dash. Lighting codes refer to runway edge lights and may not represent the longest runway or full length lighting.

AIRPORT TRAFFIC SERVICE AND AIRSPACE INFORMATION

Only the controlled and reserved airspace effective below 18,000 ft. MSL are shown.

- Class B Airspace
- Class C Airspace (Mode C - see FAR 91.215/AIM.)
- Class D Airspace
- Class E Airspace
- Class E Airspace with floor 700 ft. above surface that laterally abuts Class G Airspace.
- Class E Airspace with floor 700 ft. above surface that laterally abuts 1200 ft. or higher Class E Airspace
- Class E Airspace with floor 1200 ft. or greater above surface that laterally abuts Class G Airspace

2400 MSL Differentiates floors of Class E Airspace greater than 700 ft. above surface.

4500 MSL Class E Airspace exists at 1200' AGL unless otherwise designated as shown above.

Class E Airspace low altitude Federal Airways and RNAV 2 Routes are indicated by center line intersection - Arrows are directed towards facilities which establish intersection.

132° V 69

Total mileage between 169

NAVAIDs on direct Airways

T 319 TK 313 RNAV Waypoint (Helicopter Only)

Prohibited, Restricted, and Warning Areas; Canadian Advisory, Danger, and Restricted Areas; Alert Area and Military Operations Area (MOA)

*Alert Areas do not extend into Class A, B, C and D airspace, or Class E airport surface areas.

Special Airport Traffic Area (See FAR 93 for details).

National Defense Airspace

Temporary Flight Restriction Area

ADIZ - Air Defense Identification Zone

MODE C (See FAR 91.215/AIM.)

National Security Area

Terminal Radar Service Area (TRSA)

MTR - Military Training Route

COMMUNICATION BOXES

122.1R 122.6 123.6 122.6

OAKDALE 362 * 122.6 OAK

CHICAGO CHI

Underline indicates no voice on frequency.

Crosshatch indicates Shutdown status.

* Operates less than continuous or On-Request.

ASOS/AWOS

R - Receive only

Frequencies above thin line box are removed to NAVAID site. Other FSS frequencies providing voice communication may be available as determined by altitude and terrain. Consult Supplement for complete information.

RADIO AIDS TO NAVIGATION

- VHF OMNI RANGE (VOR)
- VOR-DME
- DME
- Other facilities, i.e., FSS Outlet, RCO, WX CAM (AK) (See Supplement), etc.
- Non-Directional Radio Beacon (NDB)
- NDB - DME

OBSTRUCTIONS

- 1000 ft and higher AGL
- Wind Turbine
- Wind Turbine Farm
- Elevation of the top above mean sea level
- Height above ground
- Under construction or reported; position and elevation unverified
- NOTICE: Guy wires may extend outward from structures.

MISCELLANEOUS

- STADIUM
- Intermittent TFR site (within 3 NM, up to & incl 3000' AGL)
- Space Launch Activity Area
- A - Aerobatic Practice Area (See Supplement.)
- G - Glider Operations
- H - Hang Glider Activity
- U - Ultraflight Activity
- UA - Unmanned Aircraft Activity
- Parachute Jumping Area (See Supplement.)
- VPXYZ
- VFR Waypoints
- NAME (VPXYZ)

TOPOGRAPHIC INFORMATION

- Power Transmission Line
- Aerial Cable
- Lookout Tower
- 618 (Elevation Base of Tower)
- Mountain Pass
- 11823 (Elevation of Pass)
- Pass symbol does not indicate a recommended route or direction of flight and pass elevation does not indicate a recommended clearance altitude. Hazardous flight conditions may exist within and near mountain passes.

ATLANTA SECTIONAL

Federal Aviation Administration

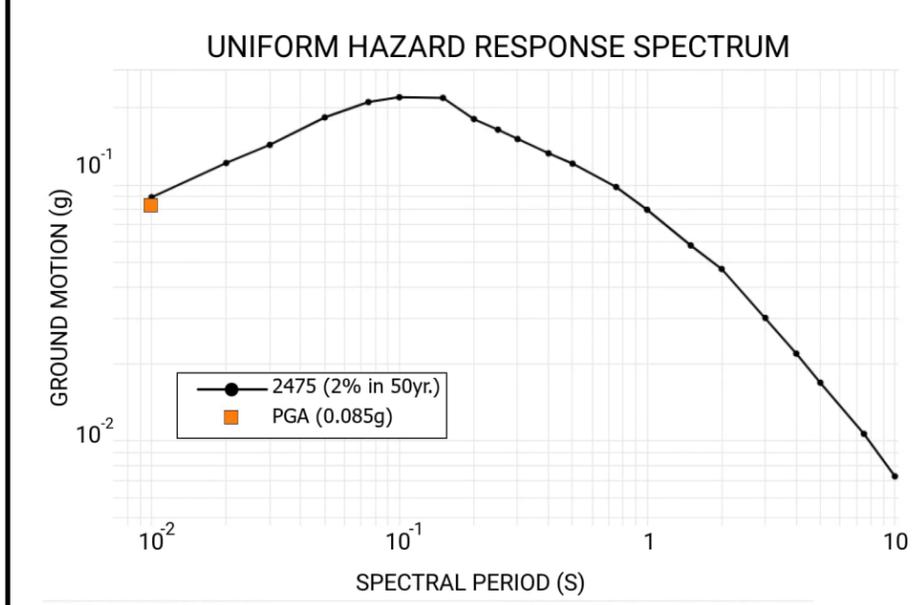
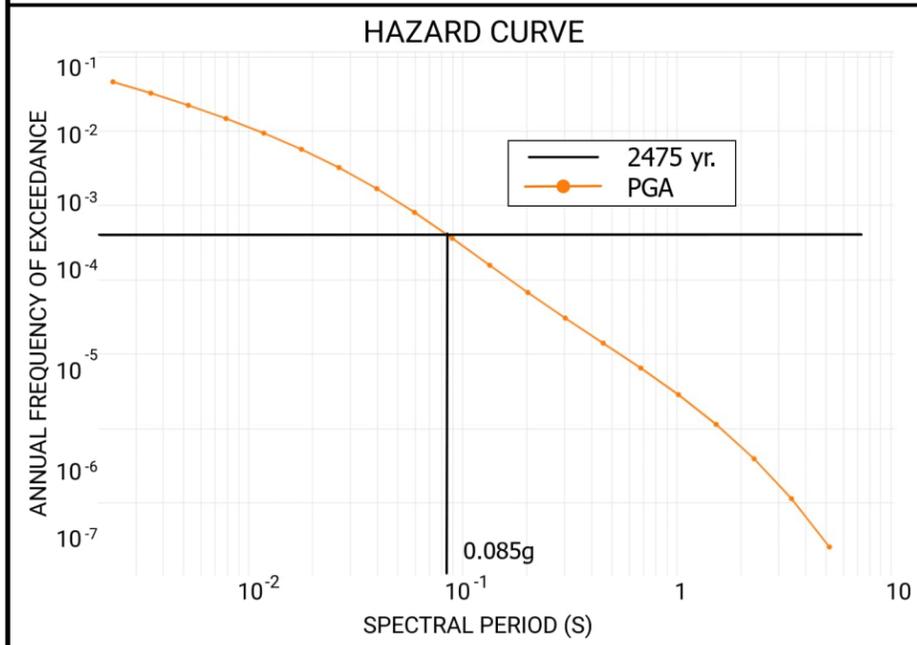
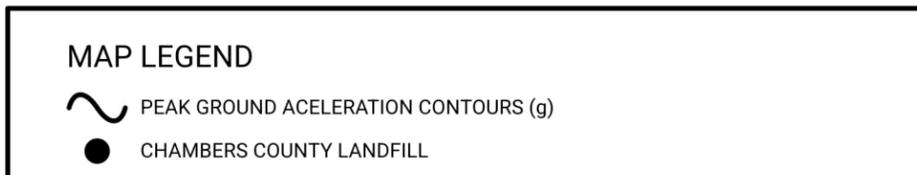
EFFECTIVE 0901Z 21 MAR 2024

TO 0901Z 16 MAY 2024

25,000 0 25,000 50,000

APPROXIMATE SCALE IN FEET

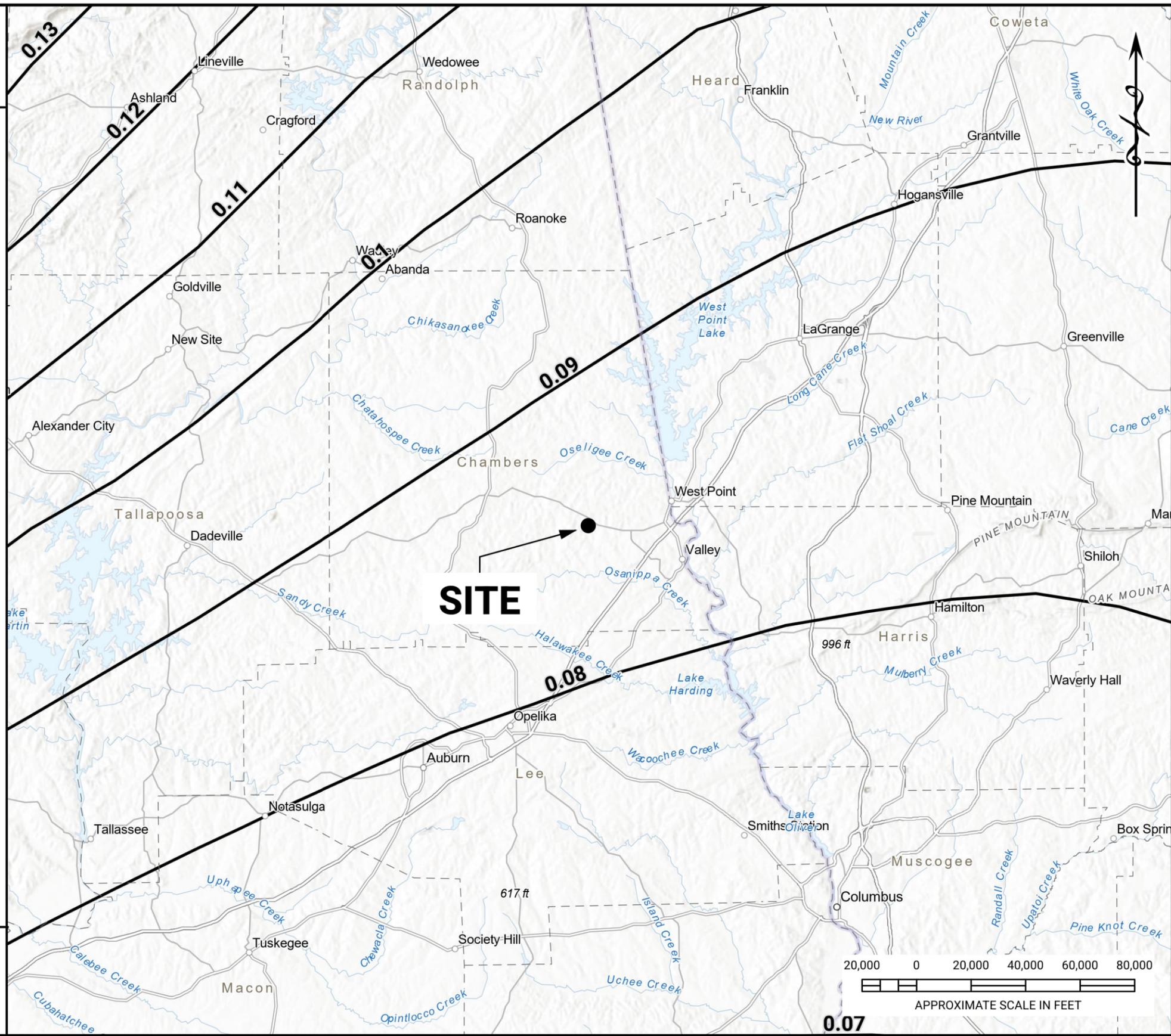
| | | | | |
|------------------|----------------------|---|---|--------|
| DRAWN BY: TAO | DATE: 4-25-24 | <p>BUNNELL LAMMONS ENGINEERING</p> | SITE LOCATION WITH RESPECT TO LOCAL AIRPORTS CHAMBERS COUNTY LANDFILL LANETT, ALABAMA | FIGURE |
| CHECKED BY: ZJD | FILE: 18020-02 FAA | | 8 | |
| APPROVED BY: AWA | JOB NO: J23-18020-02 | | | |



Model: NSHM Conterminous U.S. 2018
 Latitude: 32.8518204°
 Longitude: -85.2837782°
 Site Class: BC (Vs30 760)

Return Period: 2475 (2% in 50)
 Source Type: Total
 Truncate: Off
 Max Direction: Off

REFERENCES:
 BASEMAP - ESRI; PEAK GROUND ACCELERATION CONTOURS FOR TWO PERCENT PROBABILITY OF BEING EXCEEDED IN 50 YEARS - 2018 CONTERMINOUS U.S. NATIONAL SEISMIC HAZARD MODEL PROVIDED BY USGS REPRESENTATIVE KEN RUKSTALES ON SEPTEMBER 28, 2023; SITE-SPECIFIC PEAK GROUND ACCELERATION - THE USGS EARTHQUAKE HAZARD TOOLBOX (2018) - <https://earthquake.usgs.gov/nshmp/>



| | |
|-----------|-----|
| DRAWN: | TAO |
| CHECKED: | ZJD |
| APPROVED: | AWA |

| | |
|---------|------------------|
| DATE: | 4-26-24 |
| FILE: | 18020-02 SEISMIC |
| JOB NO: | J23-18020-02 |

| REVISIONS | | |
|-----------|-------------|----|
| No. | DESCRIPTION | BY |
| | | |
| | | |
| | | |



SEISMIC HAZARD POTENTIAL - PEAK GROUND ACCELERATION
 CHAMBERS COUNTY LANDFILL
 LANETT, ALABAMA

FIGURE
9

APPENDIX A

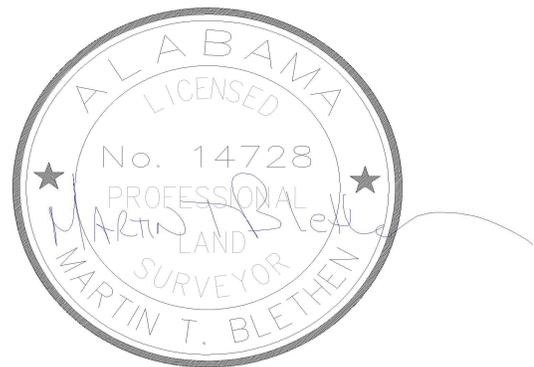
As-Built Survey Data

| |
|--|
| MONITORING POINT AS-BUILT |
| CHAMBER COUNTY LANDFILL-ALABAMA |
| 5/17/2023 |
| VERTICAL DATUM = NAVD88 |
| HORIZONTAL DATUM = NAD83 ALABAMA EAST ZONE |

| DESIGNATION | NORTHING | EASTING | ELEVATION |
|----------------|-----------|-----------|-----------|
| MW8 CONCRETE | 855581.38 | 824947.77 | 761.96 |
| MW8 CASING | 855581.60 | 824947.72 | 762.09 |
| MW8 GROUND | 855581.16 | 824947.83 | 761.74 |
| MW-5R CONCRETE | 853917.98 | 824054.28 | 687.61 |
| MW-5R CASING | 853917.73 | 824054.14 | 690.42 |
| MW-5R GROUND | 853918.60 | 824052.92 | 686.63 |
| MW-6R CONCRETE | 853946.69 | 823616.21 | 677.69 |
| MW-6R CASING | 853946.34 | 823615.66 | 680.59 |
| MW-6R GROUND | 853946.35 | 823617.42 | 677.46 |
| MW-7R CASING | 854947.33 | 823676.28 | 703.10 |
| MW-7R GROUND | 854947.36 | 823675.40 | 700.42 |
| MW-7R CONCRETE | 854947.52 | 823676.61 | 700.98 |
| MW-3R CASING | 854817.38 | 825635.74 | 728.27 |
| MW-3R CONCRETE | 854817.91 | 825635.86 | 725.74 |
| MW-3R GROUND | 854816.70 | 825635.85 | 725.51 |
| MW-9R CASING | 856143.53 | 825737.65 | 720.56 |
| MW-9R GROUND | 856142.93 | 825737.74 | 718.96 |
| MW-9R CONCRETE | 856143.33 | 825737.87 | 718.98 |
| MW-10 CONCRETE | 856527.69 | 825631.28 | 726.14 |
| MW-10 CASING | 856527.55 | 825631.11 | 727.54 |
| MW-10 GROUND | 856526.47 | 825631.04 | 725.92 |



| CHAMBERS COUNTY LANDFILL | | | |
|--------------------------|-----------|-----------|-----------|
| WELLS | | | |
| 5-17-23 | | | |
| DESGINATION | NORTHING | EASTING | ELEVATION |
| BLE-1 | 856751.83 | 823884.85 | 701.82 |
| BLE-1 GROUND | 856751.88 | 823884.98 | 698.57 |
| BLE-2 | 856077.74 | 823758.06 | 700.71 |
| BLE-2 GROUND | 856077.79 | 823757.86 | 697.41 |
| BLE-3 | 855358.6 | 824164.26 | 728.99 |
| BLE-3 GROUND | 855358.49 | 824164.19 | 725.72 |
| BLE-4 | 856741.24 | 825343.43 | 743.89 |
| BLE-4 GROUND | 856741.08 | 825343.21 | 740.63 |
| BLE-5 | 856983.08 | 826358.86 | 764.45 |
| BLE-5 GROUND | 856983.22 | 826358.91 | 760.93 |
| BLE-6 | 857287.65 | 825626.16 | 755.52 |
| BLE-6 GROUND | 857287.62 | 825626.43 | 751.99 |
| BLE-7 | 857466.33 | 825199.29 | 735.78 |
| BLE-7 GROUND | 857466.57 | 825199.24 | 733.06 |
| BLE-8 | 857930.71 | 825433.46 | 758.57 |
| BLE-8 GROUND | 857930.67 | 825433.52 | 754.93 |
| BLE-9 | 857337.19 | 826124.91 | 766.72 |
| BLE-9 GROUND | 857337.2 | 826124.95 | 763.47 |
| BLE-R1 | 857012.57 | 826356.51 | 763.51 |



APPENDIX B

Boring Logs and Piezometer Installation Diagrams

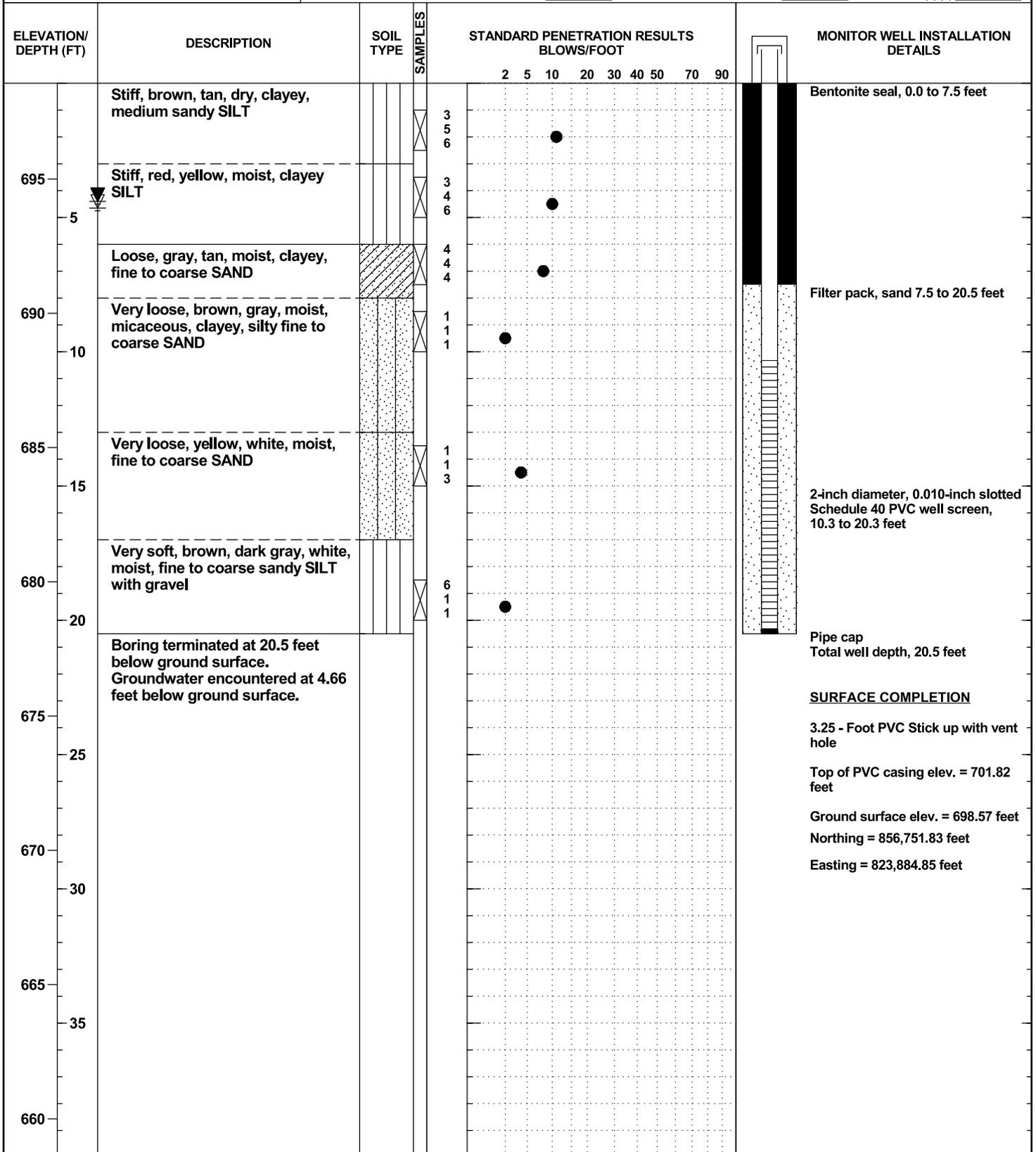


BORING NO. BLE-1

**BUNNELL-LAMMONS
ENGINEERING, INC.**
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS

PROJECT: Chambers County Limited Hydro
 CLIENT: Chambers County Landfill, LLC
 LOCATION: Lanett, Alabama
 DRILLER: Tri-State Drilling, A. Bisching
 DRILLING METHOD: CME-55 with 7.25" O.D. Hollow Stem Auger
 DEPTH TO - WATER> INITIAL: ∇ 4.66 AFTER 24 HOURS: ∇ 4.41 CAVING ∇

PROJECT NO.: J23-18020-02
 START: 4-24-23 END: 4-24-23
 ELEVATION: 698.57
 LOGGED BY: A. Jones



GEOI_WELL_18020-02.GPJ 8/7/23

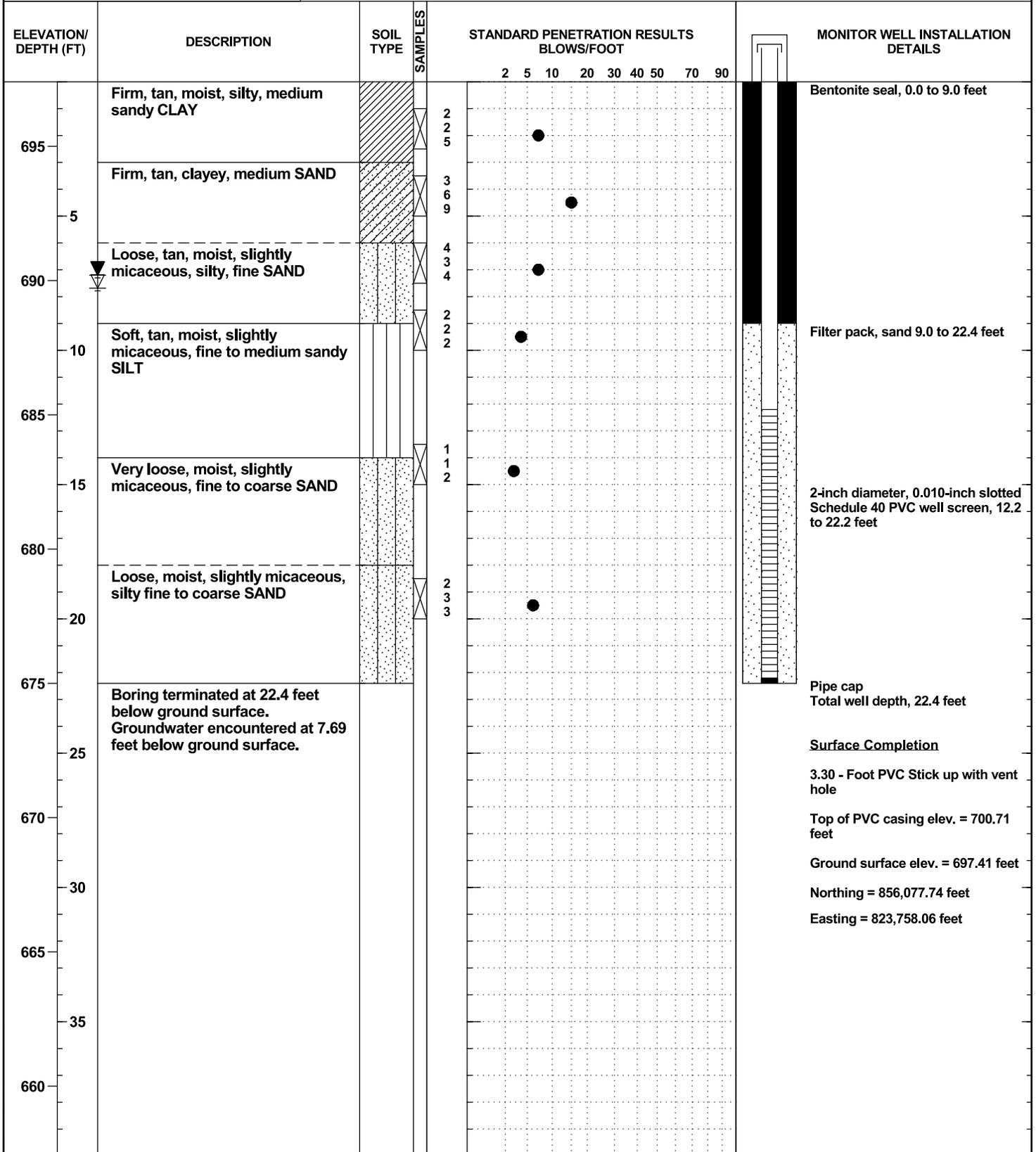


**BUNNELL-LAMMONS
ENGINEERING, INC.**
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS

BORING NO. BLE-2

PROJECT: Chambers County Limited Hydro
 CLIENT: Chambers County Landfill, LLC
 LOCATION: Lanett, Alabama
 DRILLER: Tri-State Drilling, A. Bisching
 DRILLING METHOD: CME-55 with 7.25" O.D. Hollow Stem Auger
 DEPTH TO - WATER> INITIAL: ▽ 7.69 AFTER 24 HOURS: ▽ 7.20 CAVING> ⊗

PROJECT NO.: J23-18020-02
 START: 4-25-23 END: 4-25-23
 ELEVATION: 697.41
 LOGGED BY: A. Jones



GEO_T_WELL_18020-02.GPJ 8/7/23



BORING NO. BLE-3

**BUNNELL-LAMMONS
ENGINEERING, INC.**
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS

PROJECT: Chambers County Limited Hydro

PROJECT NO.: J23-18020-02

CLIENT: Chambers County Landfill, LLC

START: 4-25-23 END: 4-25-23

LOCATION: Lanett, Alabama

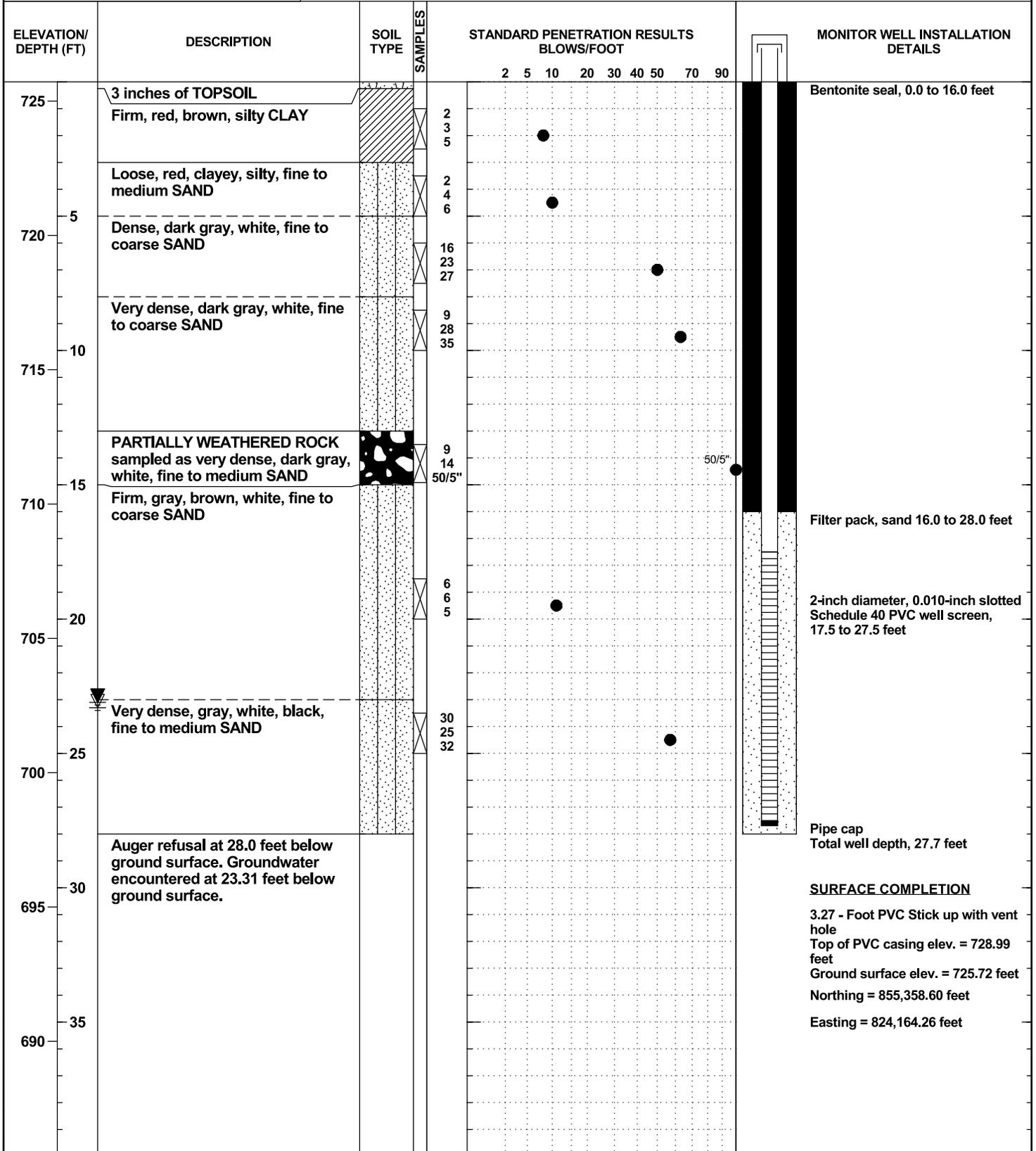
ELEVATION: 725.72

DRILLER: Tri-State Drilling, A. Bisching

LOGGED BY: A. Jones

DRILLING METHOD: CME-55 with 7.25" O.D. Hollow Stem Auger

DEPTH TO - WATER> INITIAL: 23.31 AFTER 24 HOURS: 23.10 CAVING>



GEOI_WELL_18020-02.GPJ 8/7/23

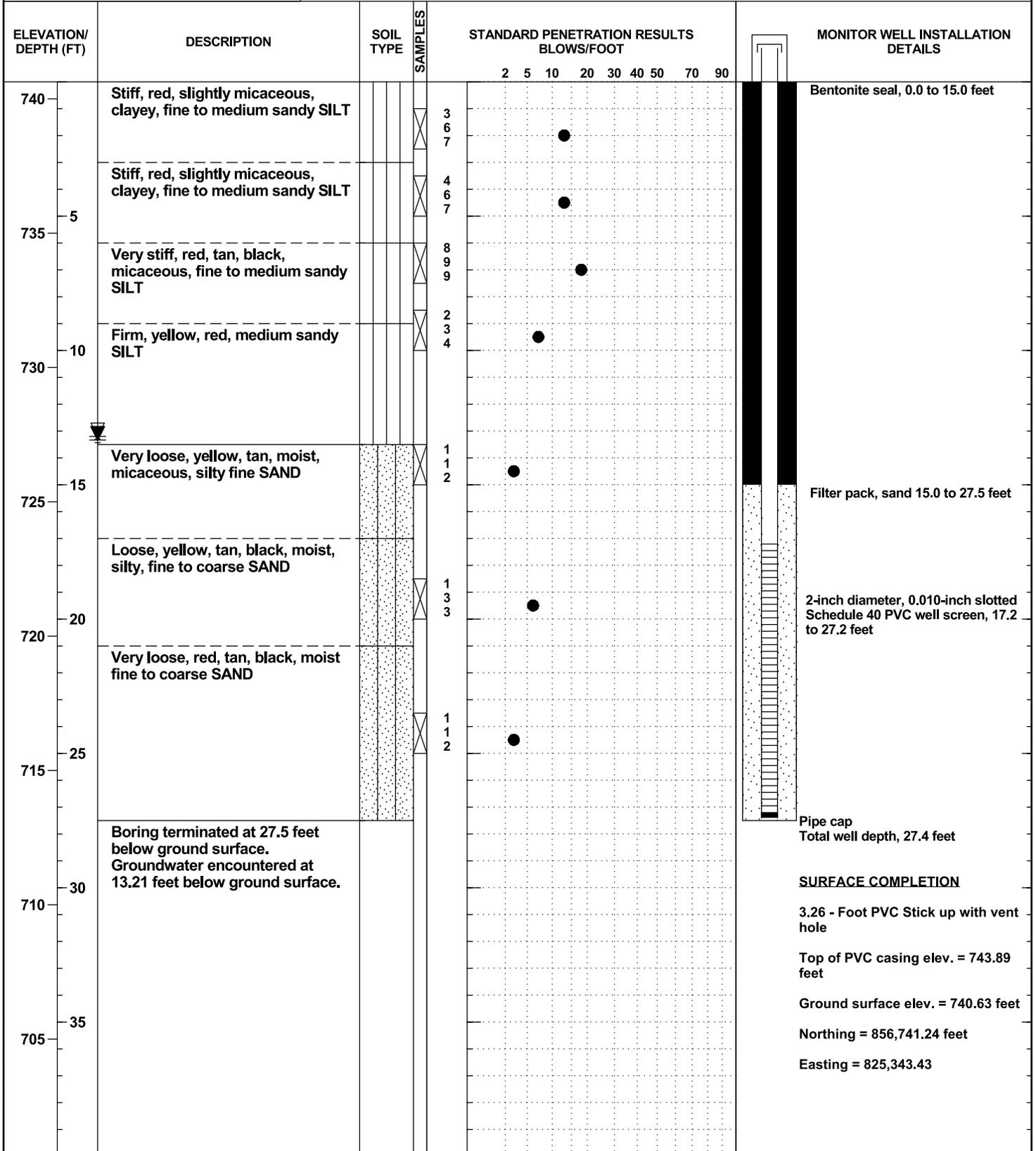


BORING NO. BLE-4

**BUNNELL-LAMMONS
ENGINEERING, INC.**
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS

PROJECT: Chambers County Limited Hydro
 CLIENT: Chambers County Landfill, LLC
 LOCATION: Lanett, Alabama
 DRILLER: Tri-State Drilling, A. Bisching
 DRILLING METHOD: CME-55 with 7.25" O.D. Hollow Stem Auger
 DEPTH TO - WATER> INITIAL: ▽ 13.21 AFTER 24 HOURS: ▽ 13.33 CAVING> ⊗

PROJECT NO.: J23-18020-02
 START: 4-24-23 END: 4-24-23
 ELEVATION: 740.63
 LOGGED BY: A. Jones



SURFACE COMPLETION
 3.26 - Foot PVC Stick up with vent hole
 Top of PVC casing elev. = 743.89 feet
 Ground surface elev. = 740.63 feet
 Northing = 856,741.24 feet
 Easting = 825,343.43

GEOI_WELL_18020-02.GPJ 8/7/23



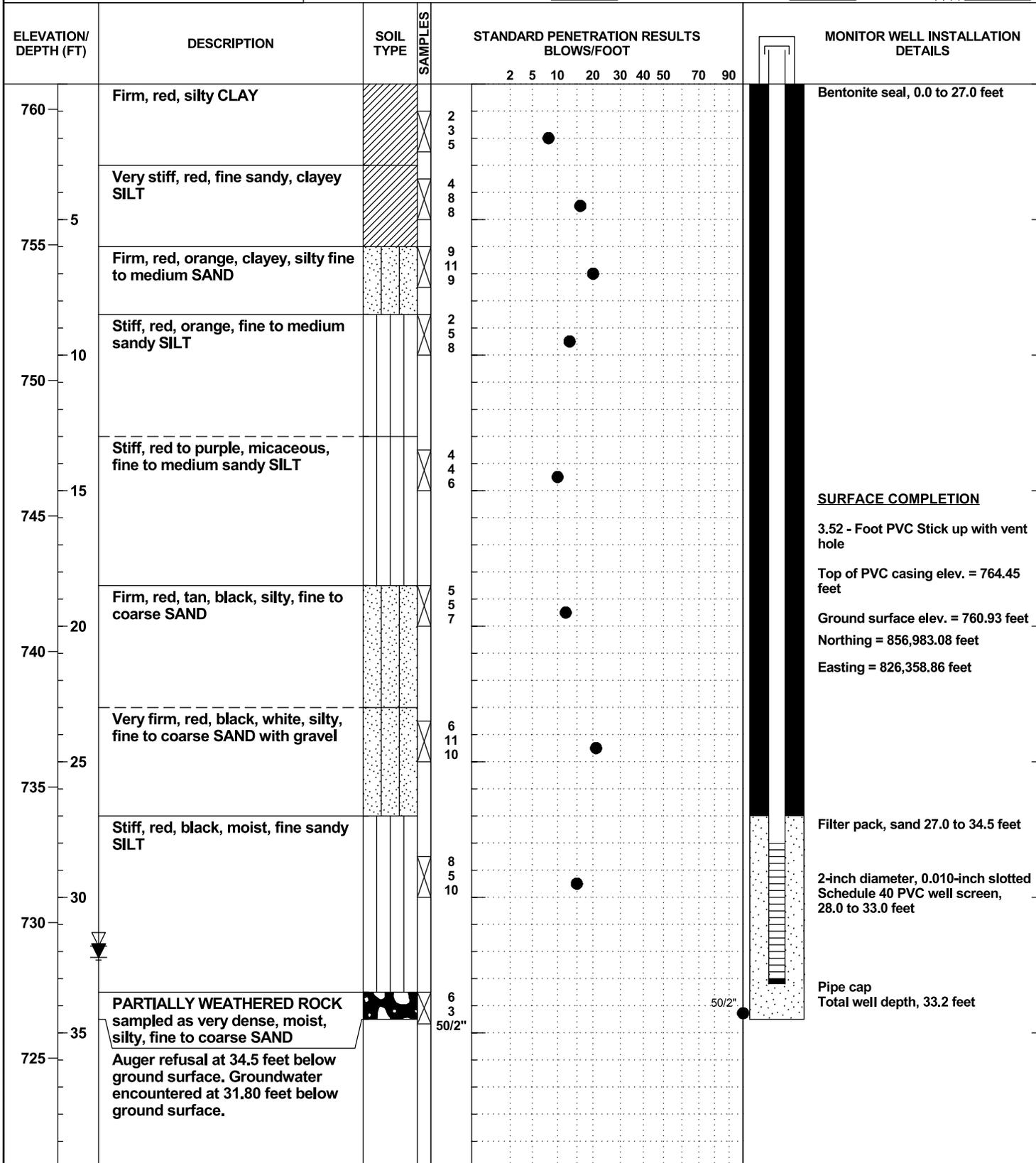
BORING NO. BLE-5

**BUNNELL-LAMMONS
ENGINEERING, INC.**
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS

PROJECT: Chambers County Limited Hydro
CLIENT: Chambers County Landfill, LLC
LOCATION: Lanett, Alabama
DRILLER: Tri-State Drilling, A. Bisching
DRILLING METHOD: CME-55 with 7.25" O.D. Hollow Stem Auger

PROJECT NO.: J23-18020-02
START: 4-24-23 END: 4-24-23
ELEVATION: 760.93
LOGGED BY: A. Jones

DEPTH TO - WATER> INITIAL: 31.80 AFTER 24 HOURS: 32.22 CAVING>



GEOI_WELL_18020-02.GPJ 8/7/23



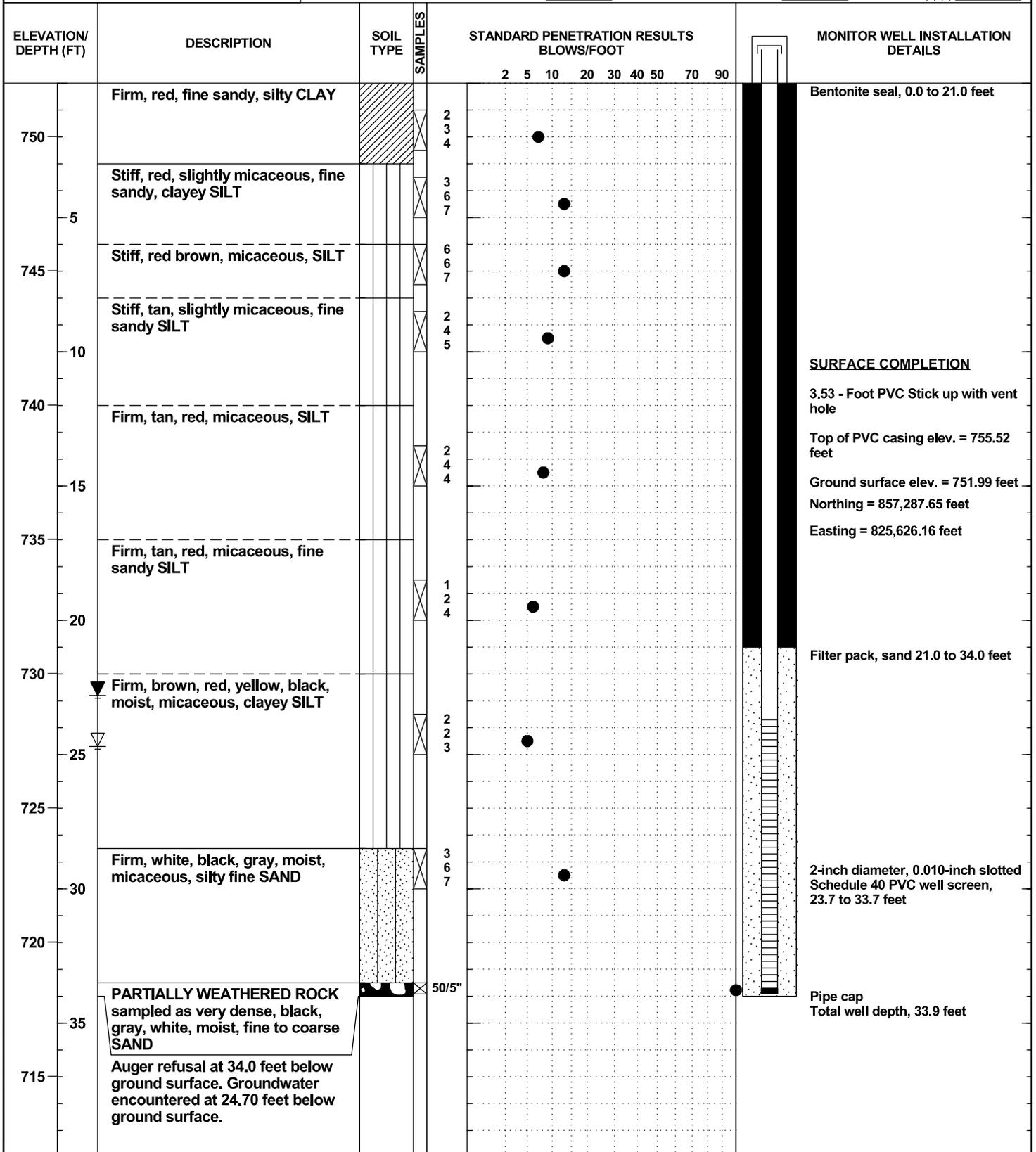
BORING NO. BLE-6

**BUNNELL-LAMMONS
ENGINEERING, INC.**
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS

PROJECT: Chambers County Limited Hydro
CLIENT: Chambers County Landfill, LLC
LOCATION: Lanett, Alabama
DRILLER: Tri-State Drilling, A. Bisching
DRILLING METHOD: CME-55 with 7.25" O.D. Hollow Stem Auger

PROJECT NO.: J23-18020-02
START: 4-21-23 END: 4-21-23
ELEVATION: 751.99
LOGGED BY: A. Jones

DEPTH TO - WATER> INITIAL: ∇ 24.70 AFTER 24 HOURS: ∇ 22.80 CAVING ∇



GEOI_WELL_18020-02.GPJ 8/7/23



BORING NO. BLE-8

**BUNNELL-LAMMONS
ENGINEERING, INC.**
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS

PROJECT: Chambers County Limited Hydro
CLIENT: Chambers County Landfill, LLC
LOCATION: Lanett, Alabama
DRILLER: Tri-State Drilling, A. Bisching
DRILLING METHOD: CME-55 7.25" Hollow Stem Auger
DEPTH TO - WATER> INITIAL: ∇ 34.90 AFTER 24 HOURS: ∇ 32.84 CAVING>

PROJECT NO.: J23-18020-02
START: 4-20-23 END: 4-21-23
ELEVATION: 754.93
LOGGED BY: A. Jones

| ELEVATION/ DEPTH (FT) | DESCRIPTION | SOIL TYPE | SAMPLES | STANDARD PENETRATION RESULTS BLOWS/FOOT | | | | | | | | MONITOR WELL INSTALLATION DETAILS | | |
|--------------------------|--|--------------|--------------|--|---|----|----|----|----|----|----|--------------------------------------|----|---|
| | | | | 2 | 5 | 10 | 20 | 30 | 40 | 50 | 70 | | 90 | |
| 710 - 45 | coarse SAND | | | | | | | | | | | | | 2-inch diameter, 0.010-inch slotted Schedule 40 PVC well screen, 35.8 to 45.8 feet Pipe cap Total well depth, 46.0 feet |
| | Very firm, brown, gray, moist, micaceous, silty, fine to coarse SAND | | 4 8 20 | | | | | | | | | | | |
| | Boring terminated at 46.0 feet below ground surface. Groundwater encountered at 34.9 feet below ground surface. | | | | | | | | | | | | | |
| 705 - 50 | | | | | | | | | | | | | | |
| 700 - 55 | | | | | | | | | | | | | | |
| 695 - 60 | | | | | | | | | | | | | | |
| 690 - 65 | | | | | | | | | | | | | | |
| 685 - 70 | | | | | | | | | | | | | | |
| 680 - 75 | | | | | | | | | | | | | | |

GEOT_WELL_18020-02.GPJ 8/7/23

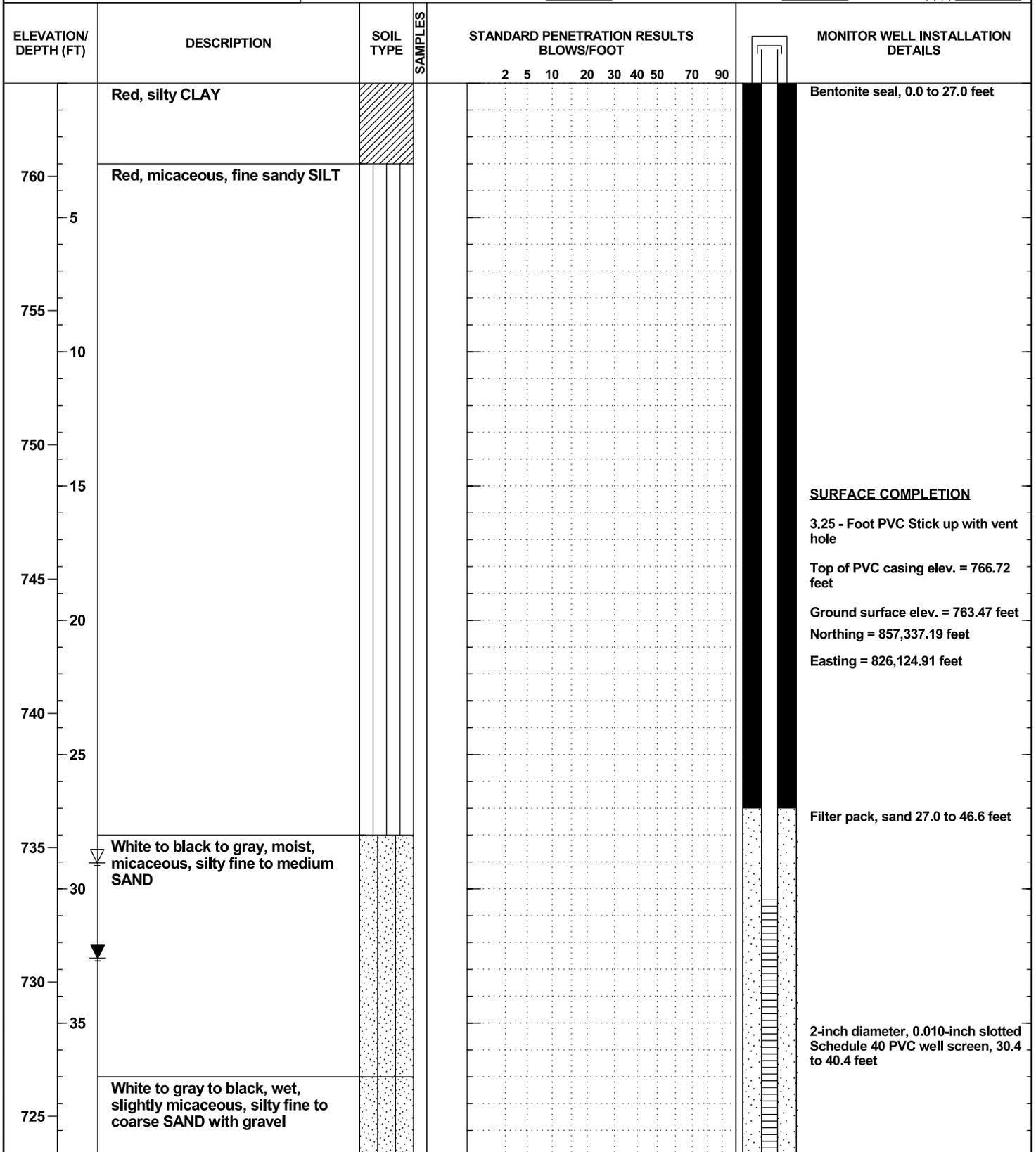


BORING NO. BLE-9

**BUNNELL-LAMMONS
ENGINEERING, INC.**
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS

PROJECT: Chambers County Limited Hydro
 CLIENT: Chambers County Landfill, LLC
 LOCATION: Lanett, Alabama
 DRILLER: Tri-State Drilling, A. Bisching
 DRILLING METHOD: CME-55 with 7.25" O.D. Hollow Stem Auger
 DEPTH TO - WATER> INITIAL: ∇ 29.12 AFTER 24 HOURS: ∇ 32.58 CAVING>

PROJECT NO.: J23-18020-02
 START: 4-25-23 END: 4-25-23
 ELEVATION: 763.47
 LOGGED BY: A. Jones



GEOI_WELL_18020-02.GPJ 8/7/23



BORING NO. BLE-9

**BUNNELL-LAMMONS
ENGINEERING, INC.**
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS

PROJECT: Chambers County Limited Hydro
 CLIENT: Chambers County Landfill, LLC
 LOCATION: Lanett, Alabama
 DRILLER: Tri-State Drilling, A. Bisching
 DRILLING METHOD: CME-55 with 7.25" O.D. Hollow Stem Auger
 DEPTH TO - WATER> INITIAL: ▽ 29.12 AFTER 24 HOURS: ▽ 32.58 CAVING> ⊗

PROJECT NO.: J23-18020-02
 START: 4-25-23 END: 4-25-23
 ELEVATION: 763.47
 LOGGED BY: A. Jones

| ELEVATION/ DEPTH (FT) | DESCRIPTION | SOIL TYPE | SAMPLES | STANDARD PENETRATION RESULTS BLOWS/FOOT | | | | | | | | MONITOR WELL INSTALLATION DETAILS | | |
|--------------------------|---|--------------|---------|--|---|----|----|----|----|----|----|--------------------------------------|----|---|
| | | | | 2 | 5 | 10 | 20 | 30 | 40 | 50 | 70 | | 90 | |
| 720 | | | | | | | | | | | | | |  Pipe cap Total well depth, 40.6 feet |
| 45 | PARTIALLY WEATHERED ROCK sampled as white to black, silty fine to coarse gravel | | | | | | | | | | | | | |
| 715 | Auger refusal at 46.6 feet below ground surface. Groundwater encountered at 29.12 feet below ground surface. | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | | |
| 710 | | | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | | | |
| 705 | | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | | |
| 700 | | | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | | |
| 695 | | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | | |
| 690 | | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | | |
| 685 | | | | | | | | | | | | | | |

GEOI_WELL_18020-02.GPJ 8/7/23



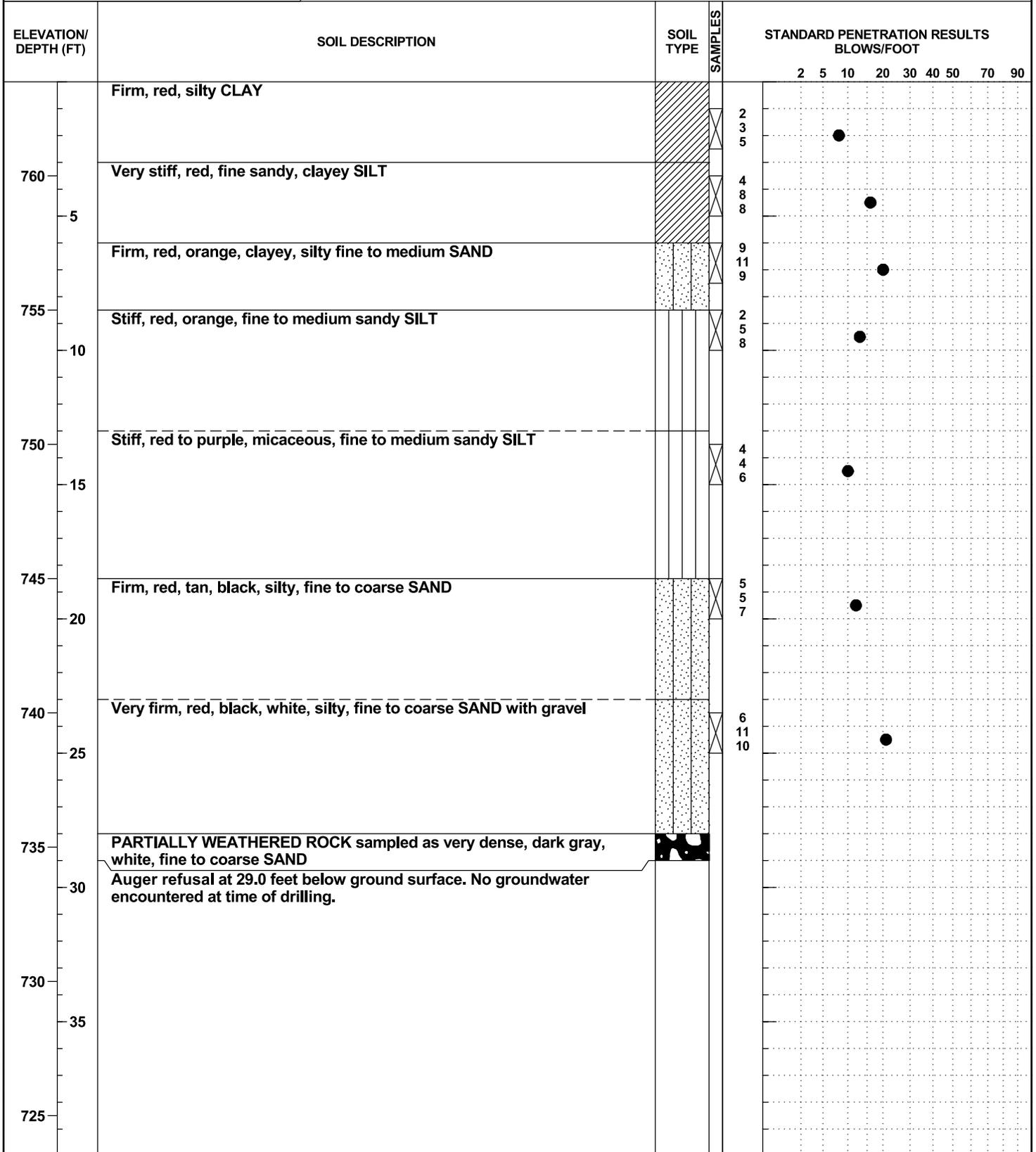
BORING NO. BLE-1R

**BUNNELL-LAMMONS
ENGINEERING, INC.**
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS

PROJECT: Chambers County Limited Hydro
CLIENT: Chambers County Landfill, LLC
LOCATION: Lanett, Alabama
DRILLER: Tri-State Drilling, A. Bisching
DRILLING METHOD: CME-55 with 7.25" O.D. Hollow Stem Auger

PROJECT NO.: J23-18020-02
START: 4-24-23 END: 4-24-23
ELEVATION: 763.51
LOGGED BY: A. Jones

DEPTH TO - WATER> INITIAL: AFTER 24 HOURS: CAVING>



GEOT_NOWELL_18020-02.GPJ 8/7/23

APPENDIX C

Precipitation Data

MONTHLY PRECIPITATION DATA - 2022 TO 2024

Alabama - Division 5

Chambers County Landfill

Lanett, Alabama

BLE Project Number J22-18020-02

| MONTH | Year/Precipitation (inches) | | | 3-Yr Monthly Avg. |
|---------------|-----------------------------|-------|-------|----------------------|
| | 2022 | 2023 | 2024 | |
| January | 4.60 | 8.12 | 8.87 | 7.20 |
| February | 5.38 | 4.25 | 5.49 | 5.04 |
| March | 7.27 | 7.41 | 6.72 | 7.13 |
| April | 5.29 | 5.40 | 3.50 | 4.73 |
| May | 4.30 | 4.14 | DNA | 4.22 |
| June | 4.45 | 5.99 | DNA | 5.22 |
| July | 6.36 | 4.83 | DNA | 5.60 |
| August | 4.53 | 4.89 | DNA | 4.71 |
| September | 2.78 | 1.90 | DNA | 2.34 |
| October | 2.97 | 2.41 | DNA | 2.69 |
| November | 5.26 | 2.73 | DNA | 4.00 |
| December | 3.50 | 2.46 | DNA | 2.98 |
| SEASON | | | | 3-Yr Seasonal Avg. |
| Winter | 17.25 | 19.78 | 21.08 | 19.37 |
| Spring | 14.04 | 15.53 | DNA | 14.79 |
| Summer | 13.67 | 11.62 | DNA | 12.65 |
| Fall | 11.73 | 7.6 | DNA | 9.67 |
| Yearly Totals | 56.69 | 54.53 | 24.58 | Yearly Avg. 55.85 |

Data Source: NOAA, public information

Months that water levels were collected from piezometers and wells at the site during the current hydrogeologic assessment.

DNA = Data Not Available

PDSI - 2022 TO 2024
Alabama - Division 5
Chambers County Landfill
Lanett, Alabama
BLE Project Number J22-18020-02

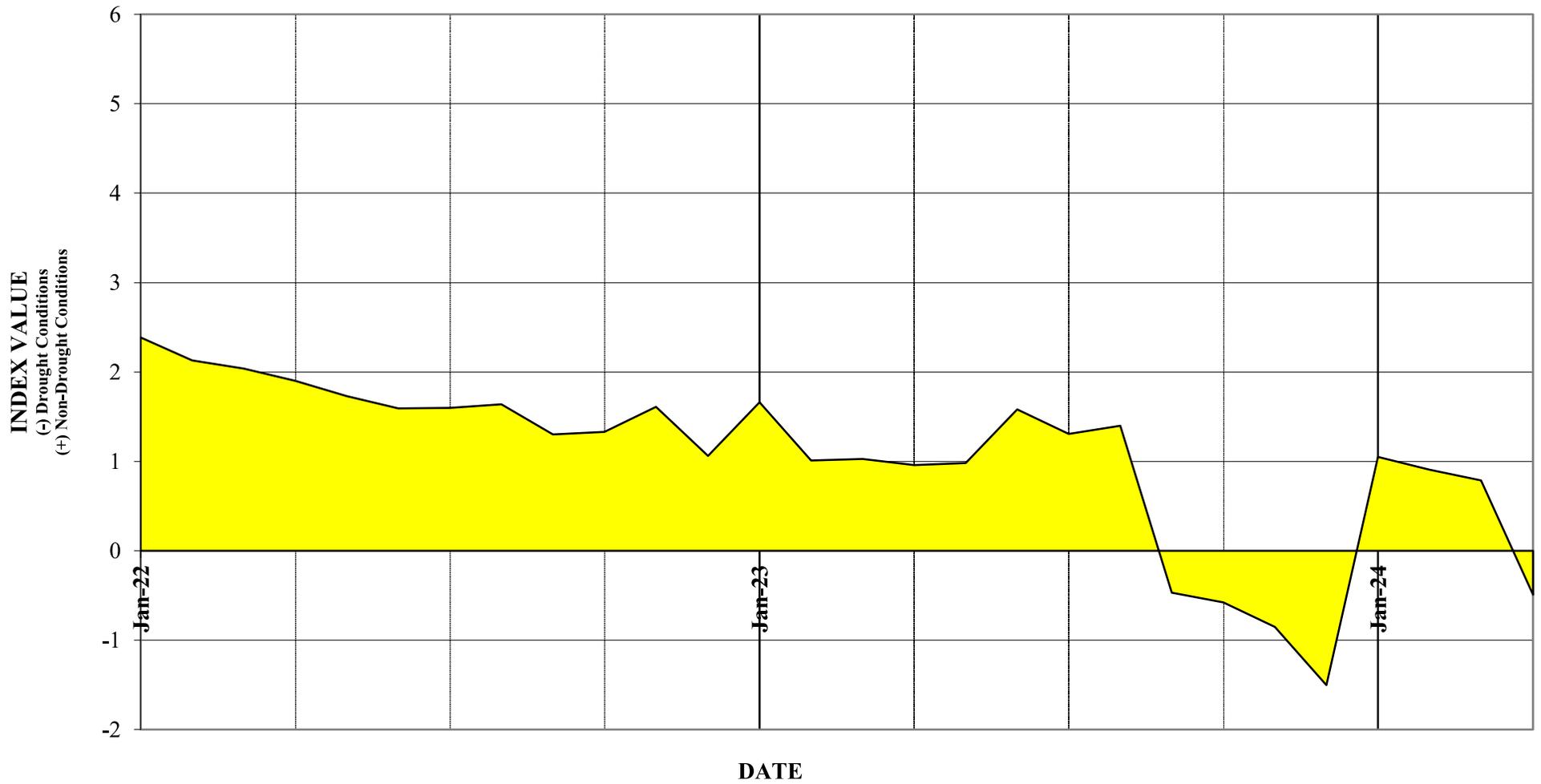
| MONTH | Year | | |
|------------------|-------------|-------------|-------------|
| | 2022 | 2023 | 2024 |
| January | 2.39 | 1.66 | 1.05 |
| February | 2.13 | 1.01 | 0.91 |
| March | 2.04 | 1.03 | 0.79 |
| April | 1.9 | 0.96 | -0.49 |
| May | 1.73 | 0.98 | DNA |
| June | 1.59 | 1.58 | DNA |
| July | 1.6 | 1.31 | DNA |
| August | 1.64 | 1.4 | DNA |
| September | 1.3 | -0.47 | DNA |
| October | 1.33 | -0.58 | DNA |
| November | 1.61 | -0.85 | DNA |
| December | 1.06 | -1.5 | DNA |
| AVERAGE | 1.69 | 0.54 | 0.57 |

Data Source: NOAA, public information - Updated through April 2024.

DNA = Data Not Available

PALMER DROUGHT SEVERITY INDEX

Alabama Division 5
Chambers County Landfill
Lanett, Alabama
BLE Project Number J22-18020-02



APPENDIX D

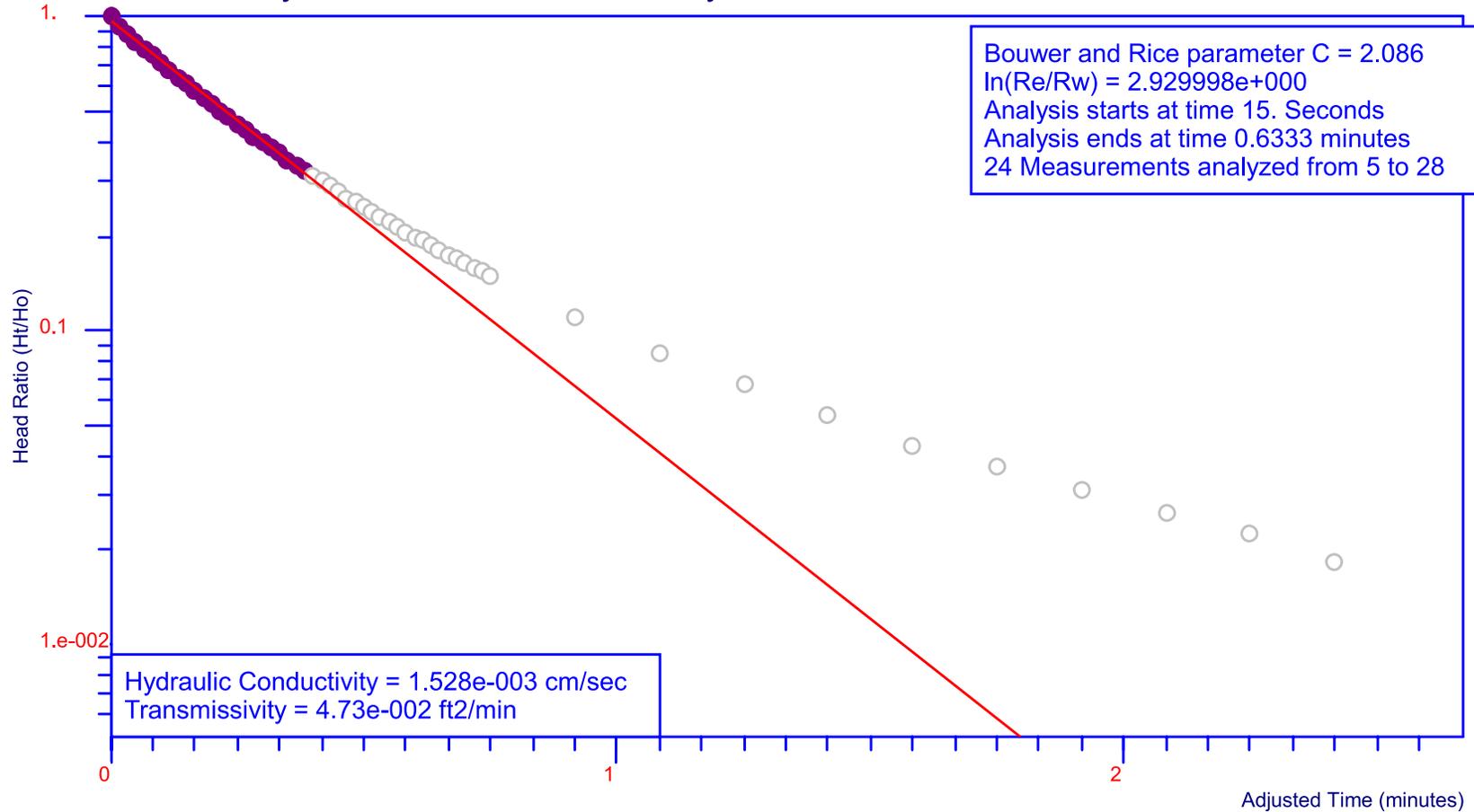
Slug Test Data

Falling Head Slug Test April 17, 2024

Chambers County Landfill Chambers County, GA

Bouwer and Rice Graph

BLE-2



Project Number: J23-18020-02 for Chambers County Landfill, LLC
Analysis by BLE Inc.

Ho is 1.69 feet at 15. Seconds

Falling Head Slug Test

Site Name: Chambers County Landfill
 Location: Chambers County, GA
 Test Date: April 17, 2024
 Client: Chambers County Landfill, LLC
 Project Number: J23-18020-02
 Import File: \\blegvlfs1\SolidWasteProjects\Chambers County AL\18020-02 Limited Hydro\10 Slug Testing\Final\BLE-2 FH.

Well Label: BLE-2
 Aquifer Thickness: 15.73 feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 3.625 Inches
 Static Water Level: 0. feet
 Water Table to Screen Bottom: 15.73 feet
 Anisotropy Ratio: 1.
 Time Adjustment: 15. Seconds

Test starts with trial 0

There are 60 time and drawdown measurements

Maximum head is 2.108 feet

Minimum head is 0. feet

| Trial | Time (minutes) | Adjusted Time (minutes) | Drawdown (feet) | Head (feet) | Head Ratio |
|-------|-------------------|----------------------------|--------------------|----------------|------------|
| 1 | 0.1833 | -6.667e-002 | 2.108 | 2.108 | 1. |
| 2 | 0.2 | -5.e-002 | 2.015 | 2.015 | 0.9559 |
| 3 | 0.2167 | -3.333e-002 | 1.899 | 1.899 | 0.9009 |
| 4 | 0.2333 | -1.667e-002 | 1.793 | 1.793 | 0.8506 |
| 5 | 0.25 | 0. | 1.69 | 1.69 | 0.8017 |
| 6 | 0.2667 | 1.667e-002 | 1.595 | 1.595 | 0.7566 |
| 7 | 0.2833 | 3.333e-002 | 1.506 | 1.506 | 0.7144 |
| 8 | 0.3 | 5.e-002 | 1.421 | 1.421 | 0.6741 |
| 9 | 0.3167 | 6.667e-002 | 1.344 | 1.344 | 0.6376 |
| 10 | 0.3333 | 8.333e-002 | 1.273 | 1.273 | 0.6039 |
| 11 | 0.35 | 1.e-001 | 1.206 | 1.206 | 0.5721 |
| 12 | 0.3667 | 0.1167 | 1.146 | 1.146 | 0.5436 |
| 13 | 0.3833 | 0.1333 | 1.087 | 1.087 | 0.5157 |
| 14 | 0.4 | 0.15 | 1.034 | 1.034 | 0.4905 |
| 15 | 0.4167 | 0.1667 | 0.983 | 0.983 | 0.4663 |
| 16 | 0.4333 | 0.1833 | 0.936 | 0.936 | 0.444 |
| 17 | 0.45 | 0.2 | 0.891 | 0.891 | 0.4227 |

Chambers County Landfill

| | | | | | |
|----|--------|--------|----------|----------|------------|
| 18 | 0.4667 | 0.2167 | 0.849 | 0.849 | 0.4028 |
| 19 | 0.4833 | 0.2333 | 0.811 | 0.811 | 0.3847 |
| 20 | 0.5 | 0.25 | 0.775 | 0.775 | 0.3676 |
| 21 | 0.5167 | 0.2667 | 0.74 | 0.74 | 0.351 |
| 22 | 0.5333 | 0.2833 | 0.707 | 0.707 | 0.3354 |
| 23 | 0.55 | 0.3 | 0.677 | 0.677 | 0.3212 |
| 24 | 0.5667 | 0.3167 | 0.648 | 0.648 | 0.3074 |
| 25 | 0.5833 | 0.3333 | 0.62 | 0.62 | 0.2941 |
| 26 | 0.6 | 0.35 | 0.593 | 0.593 | 0.2813 |
| 27 | 0.6167 | 0.3667 | 0.57 | 0.57 | 0.2704 |
| 28 | 0.6333 | 0.3833 | 0.546 | 0.546 | 0.259 |
| 29 | 0.65 | 0.4 | 0.525 | 0.525 | 0.2491 |
| 30 | 0.6667 | 0.4167 | 0.504 | 0.504 | 0.2391 |
| 31 | 0.6833 | 0.4333 | 0.486 | 0.486 | 0.2306 |
| 32 | 0.7 | 0.45 | 0.467 | 0.467 | 0.2215 |
| 33 | 0.7167 | 0.4667 | 0.449 | 0.449 | 0.213 |
| 34 | 0.7333 | 0.4833 | 0.433 | 0.433 | 0.2054 |
| 35 | 0.75 | 0.5 | 0.417 | 0.417 | 0.1978 |
| 36 | 0.7667 | 0.5167 | 0.403 | 0.403 | 0.1912 |
| 37 | 0.7833 | 0.5333 | 0.389 | 0.389 | 0.1845 |
| 38 | 0.8 | 0.55 | 0.375 | 0.375 | 0.1779 |
| 39 | 0.8167 | 0.5667 | 0.362 | 0.362 | 0.1717 |
| 40 | 0.8333 | 0.5833 | 0.349 | 0.349 | 0.1656 |
| 41 | 0.85 | 0.6 | 0.338 | 0.338 | 0.1603 |
| 42 | 0.8667 | 0.6167 | 0.326 | 0.326 | 0.1546 |
| 43 | 0.8833 | 0.6333 | 0.316 | 0.316 | 0.1499 |
| 44 | 0.9 | 0.65 | 0.306 | 0.306 | 0.1452 |
| 45 | 0.9167 | 0.6667 | 0.295 | 0.295 | 0.1399 |
| 46 | 0.9333 | 0.6833 | 0.286 | 0.286 | 0.1357 |
| 47 | 0.95 | 0.7 | 0.278 | 0.278 | 0.1319 |
| 48 | 0.9667 | 0.7167 | 0.269 | 0.269 | 0.1276 |
| 49 | 0.9833 | 0.7333 | 0.26 | 0.26 | 0.1233 |
| 50 | 1. | 0.75 | 0.252 | 0.252 | 0.1195 |
| 51 | 1.167 | 0.9167 | 0.188 | 0.188 | 8.918e-002 |
| 52 | 1.333 | 1.083 | 0.143 | 0.143 | 6.784e-002 |
| 53 | 1.5 | 1.25 | 0.113 | 0.113 | 5.361e-002 |
| 54 | 1.667 | 1.417 | 9.1e-002 | 9.1e-002 | 4.317e-002 |
| 55 | 1.833 | 1.583 | 7.3e-002 | 7.3e-002 | 3.463e-002 |
| 56 | 2. | 1.75 | 6.2e-002 | 6.2e-002 | 2.941e-002 |
| 57 | 2.167 | 1.917 | 5.2e-002 | 5.2e-002 | 2.467e-002 |
| 58 | 2.333 | 2.083 | 4.4e-002 | 4.4e-002 | 2.087e-002 |

Chambers County Landfill

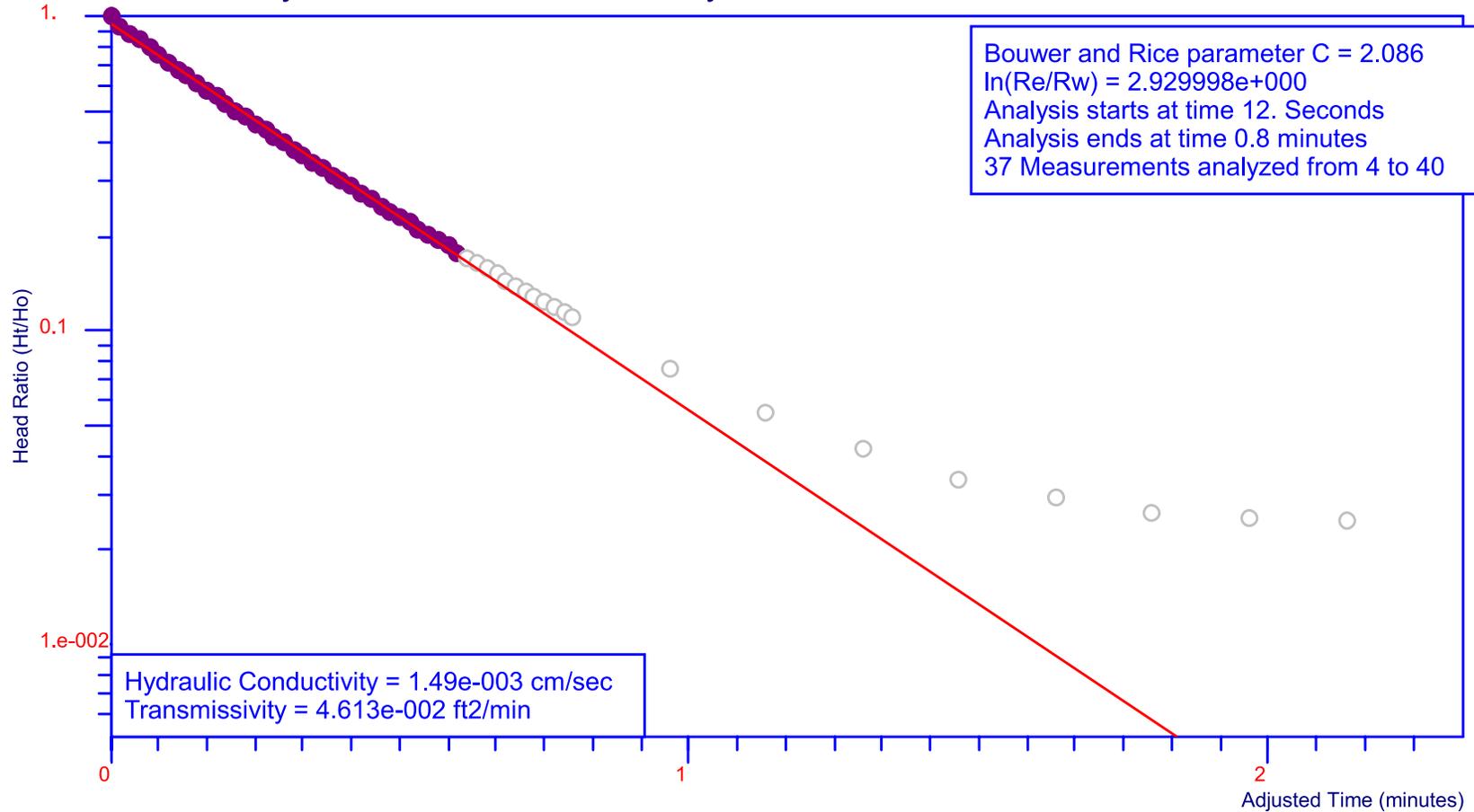
| | | | | | |
|----|-------|-------|----------|----------|------------|
| 59 | 2.5 | 2.25 | 3.8e-002 | 3.8e-002 | 1.803e-002 |
| 60 | 2.667 | 2.417 | 3.1e-002 | 3.1e-002 | 1.471e-002 |

Rising Head Slug Test April 17, 2024

Chambers County Landfill Chambers County, GA

Bouwer and Rice Graph

BLE-2



Project Number: J23-18020-02 for Chambers County Landfill, LLC

Analysis by BLE Inc.

H_o is 2.257 feet at 12. Seconds

Rising Head Slug Test

Site Name: Chambers County Landfill
 Location: Chambers County, GA
 Test Date: April 17, 2024
 Client: Chambers County Landfill, LLC
 Project Number: J23-18020-02
 Import File: \\blegvlfs1\SolidWasteProjects\Chambers County AL\18020-02 Limited Hydro\10 Slug Testing\Final\BLE-2 RH

Well Label: BLE-2
 Aquifer Thickness: 15.73 feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 3.625 Inches
 Static Water Level: 0. feet
 Water Table to Screen Bottom: 15.73 feet
 Anisotropy Ratio: 1.
 Time Adjustment: 12. Seconds

Test starts with trial 0
 There are 60 time and drawdown measurements
 Maximum head is 2.699 feet
 Minimum head is 0. feet

| Trial | Time (minutes) | Adjusted Time (minutes) | Drawdown (feet) | Head (feet) | Head Ratio |
|-------|----------------|-------------------------|-----------------|-------------|------------|
| 1 | 0.15 | -5.e-002 | 2.699 | 2.699 | 1. |
| 2 | 0.1667 | -3.333e-002 | 2.566 | 2.566 | 0.9507 |
| 3 | 0.1833 | -1.667e-002 | 2.405 | 2.405 | 0.8911 |
| 4 | 0.2 | 0. | 2.257 | 2.257 | 0.8362 |
| 5 | 0.2167 | 1.667e-002 | 2.13 | 2.13 | 0.7892 |
| 6 | 0.2333 | 3.333e-002 | 2.013 | 2.013 | 0.7458 |
| 7 | 0.25 | 5.e-002 | 1.906 | 1.906 | 0.7062 |
| 8 | 0.2667 | 6.667e-002 | 1.806 | 1.806 | 0.6691 |
| 9 | 0.2833 | 8.333e-002 | 1.707 | 1.707 | 0.6325 |
| 10 | 0.3 | 1.e-001 | 1.62 | 1.62 | 0.6002 |
| 11 | 0.3167 | 0.1167 | 1.539 | 1.539 | 0.5702 |
| 12 | 0.3333 | 0.1333 | 1.462 | 1.462 | 0.5417 |
| 13 | 0.35 | 0.15 | 1.389 | 1.389 | 0.5146 |
| 14 | 0.3667 | 0.1667 | 1.321 | 1.321 | 0.4894 |
| 15 | 0.3833 | 0.1833 | 1.258 | 1.258 | 0.4661 |
| 16 | 0.4 | 0.2 | 1.196 | 1.196 | 0.4431 |
| 17 | 0.4167 | 0.2167 | 1.139 | 1.139 | 0.422 |

Chambers County Landfill

| | | | | | |
|----|--------|--------|----------|----------|------------|
| 18 | 0.4333 | 0.2333 | 1.085 | 1.085 | 0.402 |
| 19 | 0.45 | 0.25 | 1.034 | 1.034 | 0.3831 |
| 20 | 0.4667 | 0.2667 | 0.985 | 0.985 | 0.3649 |
| 21 | 0.4833 | 0.2833 | 0.939 | 0.939 | 0.3479 |
| 22 | 0.5 | 0.3 | 0.896 | 0.896 | 0.332 |
| 23 | 0.5167 | 0.3167 | 0.855 | 0.855 | 0.3168 |
| 24 | 0.5333 | 0.3333 | 0.816 | 0.816 | 0.3023 |
| 25 | 0.55 | 0.35 | 0.78 | 0.78 | 0.289 |
| 26 | 0.5667 | 0.3667 | 0.742 | 0.742 | 0.2749 |
| 27 | 0.5833 | 0.3833 | 0.71 | 0.71 | 0.2631 |
| 28 | 0.6 | 0.4 | 0.678 | 0.678 | 0.2512 |
| 29 | 0.6167 | 0.4167 | 0.648 | 0.648 | 0.2401 |
| 30 | 0.6333 | 0.4333 | 0.62 | 0.62 | 0.2297 |
| 31 | 0.65 | 0.45 | 0.593 | 0.593 | 0.2197 |
| 32 | 0.6667 | 0.4667 | 0.567 | 0.567 | 0.2101 |
| 33 | 0.6833 | 0.4833 | 0.543 | 0.543 | 0.2012 |
| 34 | 0.7 | 0.5 | 0.519 | 0.519 | 0.1923 |
| 35 | 0.7167 | 0.5167 | 0.499 | 0.499 | 0.1849 |
| 36 | 0.7333 | 0.5333 | 0.478 | 0.478 | 0.1771 |
| 37 | 0.75 | 0.55 | 0.458 | 0.458 | 0.1697 |
| 38 | 0.7667 | 0.5667 | 0.438 | 0.438 | 0.1623 |
| 39 | 0.7833 | 0.5833 | 0.42 | 0.42 | 0.1556 |
| 40 | 0.8 | 0.6 | 0.403 | 0.403 | 0.1493 |
| 41 | 0.8167 | 0.6167 | 0.386 | 0.386 | 0.143 |
| 42 | 0.8333 | 0.6333 | 0.371 | 0.371 | 0.1375 |
| 43 | 0.85 | 0.65 | 0.355 | 0.355 | 0.1315 |
| 44 | 0.8667 | 0.6667 | 0.341 | 0.341 | 0.1263 |
| 45 | 0.8833 | 0.6833 | 0.327 | 0.327 | 0.1212 |
| 46 | 0.9 | 0.7 | 0.314 | 0.314 | 0.1163 |
| 47 | 0.9167 | 0.7167 | 0.303 | 0.303 | 0.1123 |
| 48 | 0.9333 | 0.7333 | 0.291 | 0.291 | 0.1078 |
| 49 | 0.95 | 0.75 | 0.279 | 0.279 | 0.1034 |
| 50 | 0.9667 | 0.7667 | 0.269 | 0.269 | 9.967e-002 |
| 51 | 0.9833 | 0.7833 | 0.258 | 0.258 | 9.559e-002 |
| 52 | 1. | 0.8 | 0.249 | 0.249 | 9.226e-002 |
| 53 | 1.167 | 0.9667 | 0.171 | 0.171 | 6.336e-002 |
| 54 | 1.333 | 1.133 | 0.124 | 0.124 | 4.594e-002 |
| 55 | 1.5 | 1.3 | 9.4e-002 | 9.4e-002 | 3.483e-002 |
| 56 | 1.667 | 1.467 | 7.6e-002 | 7.6e-002 | 2.816e-002 |
| 57 | 1.833 | 1.633 | 6.6e-002 | 6.6e-002 | 2.445e-002 |
| 58 | 2. | 1.8 | 5.9e-002 | 5.9e-002 | 2.186e-002 |

Chambers County Landfill

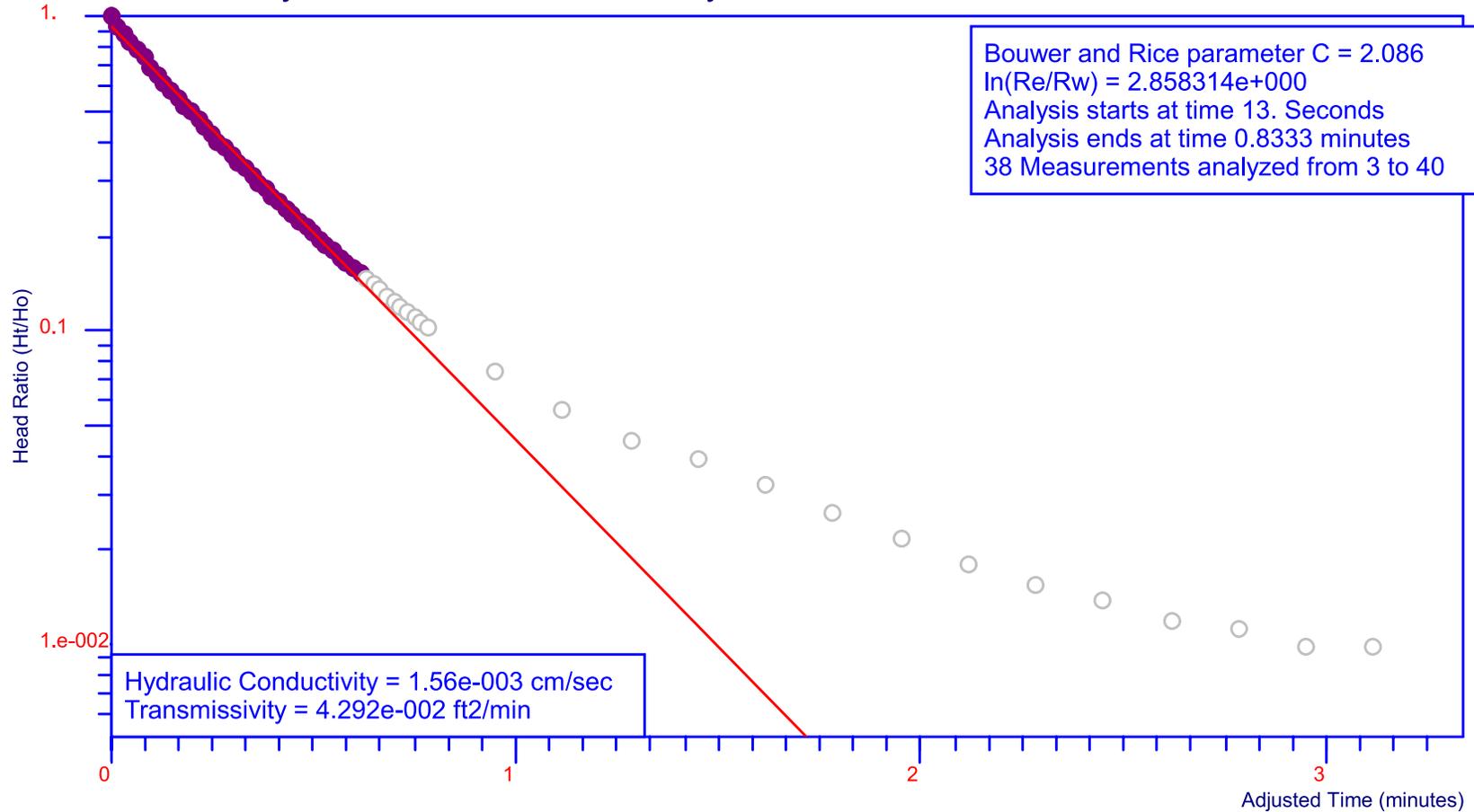
| | | | | | |
|----|-------|-------|----------|----------|------------|
| 59 | 2.167 | 1.967 | 5.7e-002 | 5.7e-002 | 2.112e-002 |
| 60 | 2.333 | 2.133 | 5.6e-002 | 5.6e-002 | 2.075e-002 |

Falling Head Slug Test April 17, 2024

Chambers County Landfill Chambers County, GA

Bouwer and Rice Graph

BLE-4



Project Number: J23-18020-02 for Chambers County Landfill, LLC

H_o is 1.953 feet at 13. Seconds

Analysis by BLE Inc.

Falling Head Slug Test

Site Name: Chambers County Landfill
 Location: Chambers County, GA
 Test Date: April 17, 2024
 Client: Chambers County Landfill, LLC
 Project Number: J23-18020-02
 Import File: \\blegvlfs1\SolidWasteProjects\Chambers County AL\18020-02 Limited Hydro\10 Slug Testing\Final\BLE-4 FH.

Well Label: BLE-4
 Aquifer Thickness: 13.98 feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 3.625 Inches
 Static Water Level: 0. feet
 Water Table to Screen Bottom: 13.98 feet
 Anisotropy Ratio: 1.
 Time Adjustment: 13. Seconds

Test starts with trial 0
 There are 64 time and drawdown measurements
 Maximum head is 2.204 feet
 Minimum head is 0. feet

| Trial | Time (minutes) | Adjusted Time (minutes) | Drawdown (feet) | Head (feet) | Head Ratio |
|-------|----------------|-------------------------|-----------------|-------------|------------|
| 1 | 0.1833 | -3.333e-002 | 2.204 | 2.204 | 1. |
| 2 | 0.2 | -1.667e-002 | 2.072 | 2.072 | 0.9401 |
| 3 | 0.2167 | 0. | 1.953 | 1.953 | 0.8861 |
| 4 | 0.2333 | 1.667e-002 | 1.838 | 1.838 | 0.8339 |
| 5 | 0.25 | 3.333e-002 | 1.729 | 1.729 | 0.7845 |
| 6 | 0.2667 | 5.e-002 | 1.628 | 1.628 | 0.7387 |
| 7 | 0.2833 | 6.667e-002 | 1.535 | 1.535 | 0.6965 |
| 8 | 0.3 | 8.333e-002 | 1.446 | 1.446 | 0.6561 |
| 9 | 0.3167 | 0.1 | 1.359 | 1.359 | 0.6166 |
| 10 | 0.3333 | 0.1167 | 1.283 | 1.283 | 0.5821 |
| 11 | 0.35 | 0.1333 | 1.212 | 1.212 | 0.5499 |
| 12 | 0.3667 | 0.15 | 1.145 | 1.145 | 0.5195 |
| 13 | 0.3833 | 0.1667 | 1.084 | 1.084 | 0.4918 |
| 14 | 0.4 | 0.1833 | 1.025 | 1.025 | 0.4651 |
| 15 | 0.4167 | 0.2 | 0.972 | 0.972 | 0.441 |
| 16 | 0.4333 | 0.2167 | 0.921 | 0.921 | 0.4179 |
| 17 | 0.45 | 0.2333 | 0.874 | 0.874 | 0.3966 |

Chambers County Landfill

| | | | | | |
|----|--------|--------|----------|----------|------------|
| 18 | 0.4667 | 0.25 | 0.829 | 0.829 | 0.3761 |
| 19 | 0.4833 | 0.2667 | 0.787 | 0.787 | 0.3571 |
| 20 | 0.5 | 0.2833 | 0.748 | 0.748 | 0.3394 |
| 21 | 0.5167 | 0.3 | 0.712 | 0.712 | 0.323 |
| 22 | 0.5333 | 0.3167 | 0.675 | 0.675 | 0.3063 |
| 23 | 0.55 | 0.3333 | 0.643 | 0.643 | 0.2917 |
| 24 | 0.5667 | 0.35 | 0.611 | 0.611 | 0.2772 |
| 25 | 0.5833 | 0.3667 | 0.581 | 0.581 | 0.2636 |
| 26 | 0.6 | 0.3833 | 0.553 | 0.553 | 0.2509 |
| 27 | 0.6167 | 0.4 | 0.527 | 0.527 | 0.2391 |
| 28 | 0.6333 | 0.4167 | 0.503 | 0.503 | 0.2282 |
| 29 | 0.65 | 0.4333 | 0.48 | 0.48 | 0.2178 |
| 30 | 0.6667 | 0.45 | 0.457 | 0.457 | 0.2074 |
| 31 | 0.6833 | 0.4667 | 0.438 | 0.438 | 0.1987 |
| 32 | 0.7 | 0.4833 | 0.419 | 0.419 | 0.1901 |
| 33 | 0.7167 | 0.5 | 0.4 | 0.4 | 0.1815 |
| 34 | 0.7333 | 0.5167 | 0.383 | 0.383 | 0.1738 |
| 35 | 0.75 | 0.5333 | 0.366 | 0.366 | 0.1661 |
| 36 | 0.7667 | 0.55 | 0.351 | 0.351 | 0.1593 |
| 37 | 0.7833 | 0.5667 | 0.336 | 0.336 | 0.1525 |
| 38 | 0.8 | 0.5833 | 0.323 | 0.323 | 0.1466 |
| 39 | 0.8167 | 0.6 | 0.309 | 0.309 | 0.1402 |
| 40 | 0.8333 | 0.6167 | 0.296 | 0.296 | 0.1343 |
| 41 | 0.85 | 0.6333 | 0.285 | 0.285 | 0.1293 |
| 42 | 0.8667 | 0.65 | 0.273 | 0.273 | 0.1239 |
| 43 | 0.8833 | 0.6667 | 0.263 | 0.263 | 0.1193 |
| 44 | 0.9 | 0.6833 | 0.252 | 0.252 | 0.1143 |
| 45 | 0.9167 | 0.7 | 0.243 | 0.243 | 0.1103 |
| 46 | 0.9333 | 0.7167 | 0.233 | 0.233 | 0.1057 |
| 47 | 0.95 | 0.7333 | 0.224 | 0.224 | 0.1016 |
| 48 | 0.9667 | 0.75 | 0.216 | 0.216 | 9.8e-002 |
| 49 | 0.9833 | 0.7667 | 0.209 | 0.209 | 9.483e-002 |
| 50 | 1. | 0.7833 | 0.201 | 0.201 | 9.12e-002 |
| 51 | 1.167 | 0.95 | 0.144 | 0.144 | 6.534e-002 |
| 52 | 1.333 | 1.117 | 0.108 | 0.108 | 4.9e-002 |
| 53 | 1.5 | 1.283 | 8.7e-002 | 8.7e-002 | 3.947e-002 |
| 54 | 1.667 | 1.45 | 7.6e-002 | 7.6e-002 | 3.448e-002 |
| 55 | 1.833 | 1.617 | 6.3e-002 | 6.3e-002 | 2.858e-002 |
| 56 | 2. | 1.783 | 5.1e-002 | 5.1e-002 | 2.314e-002 |
| 57 | 2.167 | 1.95 | 4.2e-002 | 4.2e-002 | 1.906e-002 |
| 58 | 2.333 | 2.117 | 3.5e-002 | 3.5e-002 | 1.588e-002 |

Chambers County Landfill

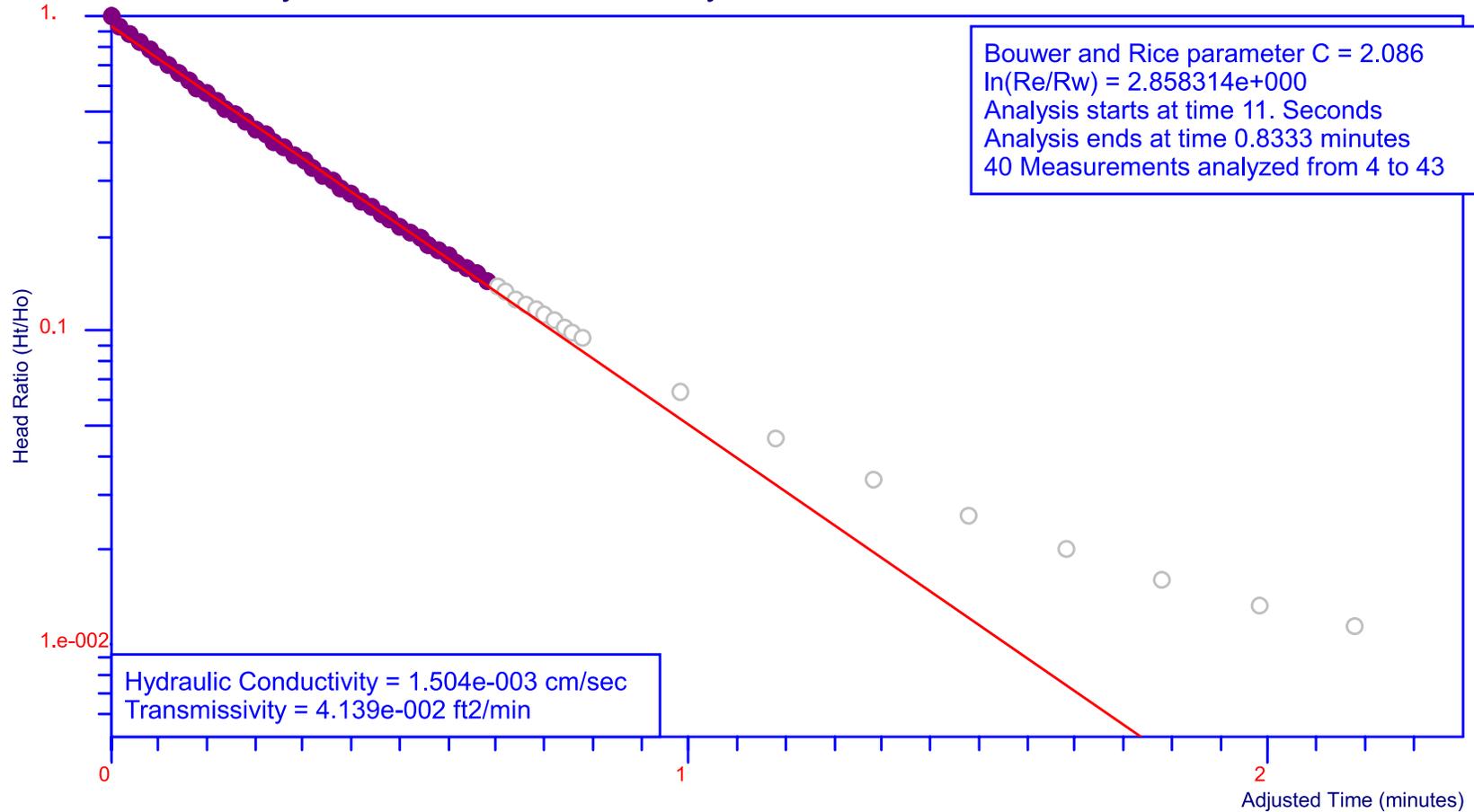
| | | | | | |
|----|-------|-------|----------|----------|------------|
| 59 | 2.5 | 2.283 | 3.e-002 | 3.e-002 | 1.361e-002 |
| 60 | 2.667 | 2.45 | 2.7e-002 | 2.7e-002 | 1.225e-002 |
| 61 | 2.833 | 2.617 | 2.3e-002 | 2.3e-002 | 1.044e-002 |
| 62 | 3. | 2.783 | 2.2e-002 | 2.2e-002 | 9.982e-003 |
| 63 | 3.167 | 2.95 | 1.9e-002 | 1.9e-002 | 8.621e-003 |
| 64 | 3.333 | 3.117 | 1.9e-002 | 1.9e-002 | 8.621e-003 |

Rising Head Slug Test April 17, 2024

Chambers County Landfill Chambers County, GA

Bouwer and Rice Graph

BLE-4



Project Number: J23-18020-02 for Chambers County Landfill, LLC
Analysis by BLE Inc.

Ho is 2.63 feet at 11. Seconds

Rising Head Slug Test

Site Name: Chambers County Landfill
 Location: Chambers County, GA
 Test Date: April 17, 2024
 Client: Chambers County Landfill, LLC
 Project Number: J23-18020-02
 Import File: \\blegvlfs1\SolidWasteProjects\Chambers County AL\18020-02 Limited Hydro\10 Slug Testing\Final\BLE-4 RH

Well Label: BLE-4
 Aquifer Thickness: 13.98 feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 3.625 Inches
 Static Water Level: 0. feet
 Water Table to Screen Bottom: 13.98 feet
 Anisotropy Ratio: 1.
 Time Adjustment: 11. Seconds

Test starts with trial 0
 There are 61 time and drawdown measurements
 Maximum head is 3.262 feet
 Minimum head is 0. feet

| Trial | Time (minutes) | Adjusted Time (minutes) | Drawdown (feet) | Head (feet) | Head Ratio |
|-------|----------------|-------------------------|-----------------|-------------|------------|
| 1 | 0.1333 | -5.e-002 | 3.262 | 3.262 | 1. |
| 2 | 0.15 | -3.333e-002 | 3.05 | 3.05 | 0.935 |
| 3 | 0.1667 | -1.667e-002 | 2.815 | 2.815 | 0.863 |
| 4 | 0.1833 | 0. | 2.63 | 2.63 | 0.8063 |
| 5 | 0.2 | 1.667e-002 | 2.47 | 2.47 | 0.7572 |
| 6 | 0.2167 | 3.333e-002 | 2.329 | 2.329 | 0.714 |
| 7 | 0.2333 | 5.e-002 | 2.201 | 2.201 | 0.6747 |
| 8 | 0.25 | 6.667e-002 | 2.077 | 2.077 | 0.6367 |
| 9 | 0.2667 | 8.333e-002 | 1.963 | 1.963 | 0.6018 |
| 10 | 0.2833 | 0.1 | 1.858 | 1.858 | 0.5696 |
| 11 | 0.3 | 0.1167 | 1.758 | 1.758 | 0.5389 |
| 12 | 0.3167 | 0.1333 | 1.661 | 1.661 | 0.5092 |
| 13 | 0.3333 | 0.15 | 1.575 | 1.575 | 0.4828 |
| 14 | 0.35 | 0.1667 | 1.494 | 1.494 | 0.458 |
| 15 | 0.3667 | 0.1833 | 1.419 | 1.419 | 0.435 |
| 16 | 0.3833 | 0.2 | 1.349 | 1.349 | 0.4135 |
| 17 | 0.4 | 0.2167 | 1.284 | 1.284 | 0.3936 |

Chambers County Landfill

| | | | | | |
|----|--------|--------|----------|----------|------------|
| 18 | 0.4167 | 0.2333 | 1.221 | 1.221 | 0.3743 |
| 19 | 0.4333 | 0.25 | 1.164 | 1.164 | 0.3568 |
| 20 | 0.45 | 0.2667 | 1.108 | 1.108 | 0.3397 |
| 21 | 0.4667 | 0.2833 | 1.057 | 1.057 | 0.324 |
| 22 | 0.4833 | 0.3 | 1.005 | 1.005 | 0.3081 |
| 23 | 0.5 | 0.3167 | 0.957 | 0.957 | 0.2934 |
| 24 | 0.5167 | 0.3333 | 0.913 | 0.913 | 0.2799 |
| 25 | 0.5333 | 0.35 | 0.87 | 0.87 | 0.2667 |
| 26 | 0.55 | 0.3667 | 0.828 | 0.828 | 0.2538 |
| 27 | 0.5667 | 0.3833 | 0.79 | 0.79 | 0.2422 |
| 28 | 0.5833 | 0.4 | 0.75 | 0.75 | 0.2299 |
| 29 | 0.6 | 0.4167 | 0.716 | 0.716 | 0.2195 |
| 30 | 0.6167 | 0.4333 | 0.683 | 0.683 | 0.2094 |
| 31 | 0.6333 | 0.45 | 0.652 | 0.652 | 0.1999 |
| 32 | 0.65 | 0.4667 | 0.622 | 0.622 | 0.1907 |
| 33 | 0.6667 | 0.4833 | 0.594 | 0.594 | 0.1821 |
| 34 | 0.6833 | 0.5 | 0.567 | 0.567 | 0.1738 |
| 35 | 0.7 | 0.5167 | 0.542 | 0.542 | 0.1662 |
| 36 | 0.7167 | 0.5333 | 0.518 | 0.518 | 0.1588 |
| 37 | 0.7333 | 0.55 | 0.495 | 0.495 | 0.1517 |
| 38 | 0.75 | 0.5667 | 0.474 | 0.474 | 0.1453 |
| 39 | 0.7667 | 0.5833 | 0.454 | 0.454 | 0.1392 |
| 40 | 0.7833 | 0.6 | 0.434 | 0.434 | 0.133 |
| 41 | 0.8 | 0.6167 | 0.415 | 0.415 | 0.1272 |
| 42 | 0.8167 | 0.6333 | 0.398 | 0.398 | 0.122 |
| 43 | 0.8333 | 0.65 | 0.38 | 0.38 | 0.1165 |
| 44 | 0.85 | 0.6667 | 0.364 | 0.364 | 0.1116 |
| 45 | 0.8667 | 0.6833 | 0.348 | 0.348 | 0.1067 |
| 46 | 0.8833 | 0.7 | 0.334 | 0.334 | 0.1024 |
| 47 | 0.9 | 0.7167 | 0.32 | 0.32 | 9.81e-002 |
| 48 | 0.9167 | 0.7333 | 0.307 | 0.307 | 9.411e-002 |
| 49 | 0.9333 | 0.75 | 0.294 | 0.294 | 9.013e-002 |
| 50 | 0.95 | 0.7667 | 0.282 | 0.282 | 8.645e-002 |
| 51 | 0.9667 | 0.7833 | 0.27 | 0.27 | 8.277e-002 |
| 52 | 0.9833 | 0.8 | 0.259 | 0.259 | 7.94e-002 |
| 53 | 1. | 0.8167 | 0.248 | 0.248 | 7.603e-002 |
| 54 | 1.167 | 0.9833 | 0.168 | 0.168 | 5.15e-002 |
| 55 | 1.333 | 1.15 | 0.119 | 0.119 | 3.648e-002 |
| 56 | 1.5 | 1.317 | 8.8e-002 | 8.8e-002 | 2.698e-002 |
| 57 | 1.667 | 1.483 | 6.7e-002 | 6.7e-002 | 2.054e-002 |
| 58 | 1.833 | 1.65 | 5.3e-002 | 5.3e-002 | 1.625e-002 |

Chambers County Landfill

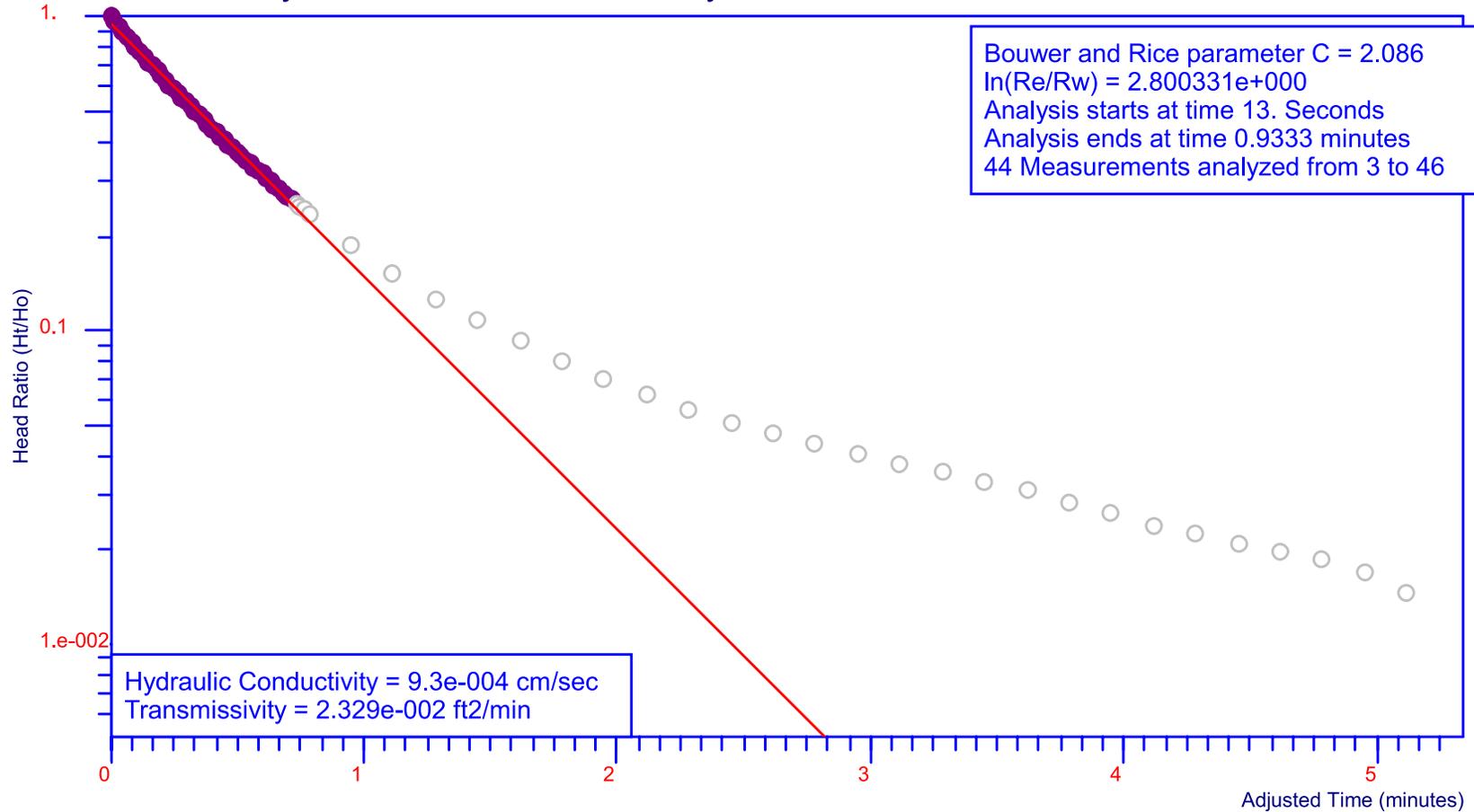
| | | | | | |
|----|-------|-------|----------|----------|------------|
| 59 | 2. | 1.817 | 4.2e-002 | 4.2e-002 | 1.288e-002 |
| 60 | 2.167 | 1.983 | 3.5e-002 | 3.5e-002 | 1.073e-002 |
| 61 | 2.333 | 2.15 | 3.e-002 | 3.e-002 | 9.197e-003 |

Falling Head Slug Test April 17, 2024

Chambers County Landfill Chambers County, GA

Bouwer and Rice Graph

BLE-6



Project Number: J23-18020-02 for Chambers County Landfill, LLC

H_o is 2.263 feet at 13. Seconds

Analysis by BLE Inc.

Falling Head Slug Test

Site Name: Chambers County Landfill
 Location: Chambers County, GA
 Test Date: April 17, 2024
 Client: Chambers County Landfill, LLC
 Project Number: J23-18020-02
 Import File: \\blegvlfs1\SolidWasteProjects\Chambers County AL\18020-02 Limited Hydro\10 Slug Testing\Final\BLE-6 FH.

Well Label: BLE-6
 Aquifer Thickness: 12.72 feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 3.625 Inches
 Static Water Level: 0. feet
 Water Table to Screen Bottom: 12.72 feet
 Anisotropy Ratio: 1.
 Time Adjustment: 13. Seconds

Test starts with trial 0

There are 76 time and drawdown measurements

Maximum head is 2.486 feet

Minimum head is 0. feet

| Trial | Time (minutes) | Adjusted Time (minutes) | Drawdown (feet) | Head (feet) | Head Ratio |
|-------|-------------------|----------------------------|--------------------|----------------|------------|
| 1 | 0.1833 | -3.333e-002 | 2.486 | 2.486 | 1. |
| 2 | 0.2 | -1.667e-002 | 2.346 | 2.346 | 0.9437 |
| 3 | 0.2167 | 0. | 2.263 | 2.263 | 0.9103 |
| 4 | 0.2333 | 1.667e-002 | 2.183 | 2.183 | 0.8781 |
| 5 | 0.25 | 3.333e-002 | 2.103 | 2.103 | 0.8459 |
| 6 | 0.2667 | 5.e-002 | 2.028 | 2.028 | 0.8158 |
| 7 | 0.2833 | 6.667e-002 | 1.957 | 1.957 | 0.7872 |
| 8 | 0.3 | 8.333e-002 | 1.873 | 1.873 | 0.7534 |
| 9 | 0.3167 | 0.1 | 1.805 | 1.805 | 0.7261 |
| 10 | 0.3333 | 0.1167 | 1.75 | 1.75 | 0.7039 |
| 11 | 0.35 | 0.1333 | 1.692 | 1.692 | 0.6806 |
| 12 | 0.3667 | 0.15 | 1.636 | 1.636 | 0.6581 |
| 13 | 0.3833 | 0.1667 | 1.583 | 1.583 | 0.6368 |
| 14 | 0.4 | 0.1833 | 1.53 | 1.53 | 0.6154 |
| 15 | 0.4167 | 0.2 | 1.479 | 1.479 | 0.5949 |
| 16 | 0.4333 | 0.2167 | 1.431 | 1.431 | 0.5756 |
| 17 | 0.45 | 0.2333 | 1.383 | 1.383 | 0.5563 |

Chambers County Landfill

| | | | | | |
|----|--------|--------|-------|-------|------------|
| 18 | 0.4667 | 0.25 | 1.339 | 1.339 | 0.5386 |
| 19 | 0.4833 | 0.2667 | 1.295 | 1.295 | 0.5209 |
| 20 | 0.5 | 0.2833 | 1.254 | 1.254 | 0.5044 |
| 21 | 0.5167 | 0.3 | 1.213 | 1.213 | 0.4879 |
| 22 | 0.5333 | 0.3167 | 1.175 | 1.175 | 0.4726 |
| 23 | 0.55 | 0.3333 | 1.138 | 1.138 | 0.4578 |
| 24 | 0.5667 | 0.35 | 1.103 | 1.103 | 0.4437 |
| 25 | 0.5833 | 0.3667 | 1.07 | 1.07 | 0.4304 |
| 26 | 0.6 | 0.3833 | 1.035 | 1.035 | 0.4163 |
| 27 | 0.6167 | 0.4 | 1.003 | 1.003 | 0.4035 |
| 28 | 0.6333 | 0.4167 | 0.973 | 0.973 | 0.3914 |
| 29 | 0.65 | 0.4333 | 0.944 | 0.944 | 0.3797 |
| 30 | 0.6667 | 0.45 | 0.917 | 0.917 | 0.3689 |
| 31 | 0.6833 | 0.4667 | 0.89 | 0.89 | 0.358 |
| 32 | 0.7 | 0.4833 | 0.864 | 0.864 | 0.3475 |
| 33 | 0.7167 | 0.5 | 0.84 | 0.84 | 0.3379 |
| 34 | 0.7333 | 0.5167 | 0.818 | 0.818 | 0.329 |
| 35 | 0.75 | 0.5333 | 0.793 | 0.793 | 0.319 |
| 36 | 0.7667 | 0.55 | 0.772 | 0.772 | 0.3105 |
| 37 | 0.7833 | 0.5667 | 0.755 | 0.755 | 0.3037 |
| 38 | 0.8 | 0.5833 | 0.731 | 0.731 | 0.294 |
| 39 | 0.8167 | 0.6 | 0.714 | 0.714 | 0.2872 |
| 40 | 0.8333 | 0.6167 | 0.698 | 0.698 | 0.2808 |
| 41 | 0.85 | 0.6333 | 0.679 | 0.679 | 0.2731 |
| 42 | 0.8667 | 0.65 | 0.659 | 0.659 | 0.2651 |
| 43 | 0.8833 | 0.6667 | 0.642 | 0.642 | 0.2582 |
| 44 | 0.9 | 0.6833 | 0.624 | 0.624 | 0.251 |
| 45 | 0.9167 | 0.7 | 0.608 | 0.608 | 0.2446 |
| 46 | 0.9333 | 0.7167 | 0.592 | 0.592 | 0.2381 |
| 47 | 0.95 | 0.7333 | 0.576 | 0.576 | 0.2317 |
| 48 | 0.9667 | 0.75 | 0.562 | 0.562 | 0.2261 |
| 49 | 0.9833 | 0.7667 | 0.548 | 0.548 | 0.2204 |
| 50 | 1. | 0.7833 | 0.534 | 0.534 | 0.2148 |
| 51 | 1.167 | 0.95 | 0.422 | 0.422 | 0.1698 |
| 52 | 1.333 | 1.117 | 0.343 | 0.343 | 0.138 |
| 53 | 1.5 | 1.283 | 0.286 | 0.286 | 0.115 |
| 54 | 1.667 | 1.45 | 0.245 | 0.245 | 9.855e-002 |
| 55 | 1.833 | 1.617 | 0.21 | 0.21 | 8.447e-002 |
| 56 | 2. | 1.783 | 0.182 | 0.182 | 7.321e-002 |
| 57 | 2.167 | 1.95 | 0.158 | 0.158 | 6.356e-002 |
| 58 | 2.333 | 2.117 | 0.141 | 0.141 | 5.672e-002 |

Chambers County Landfill

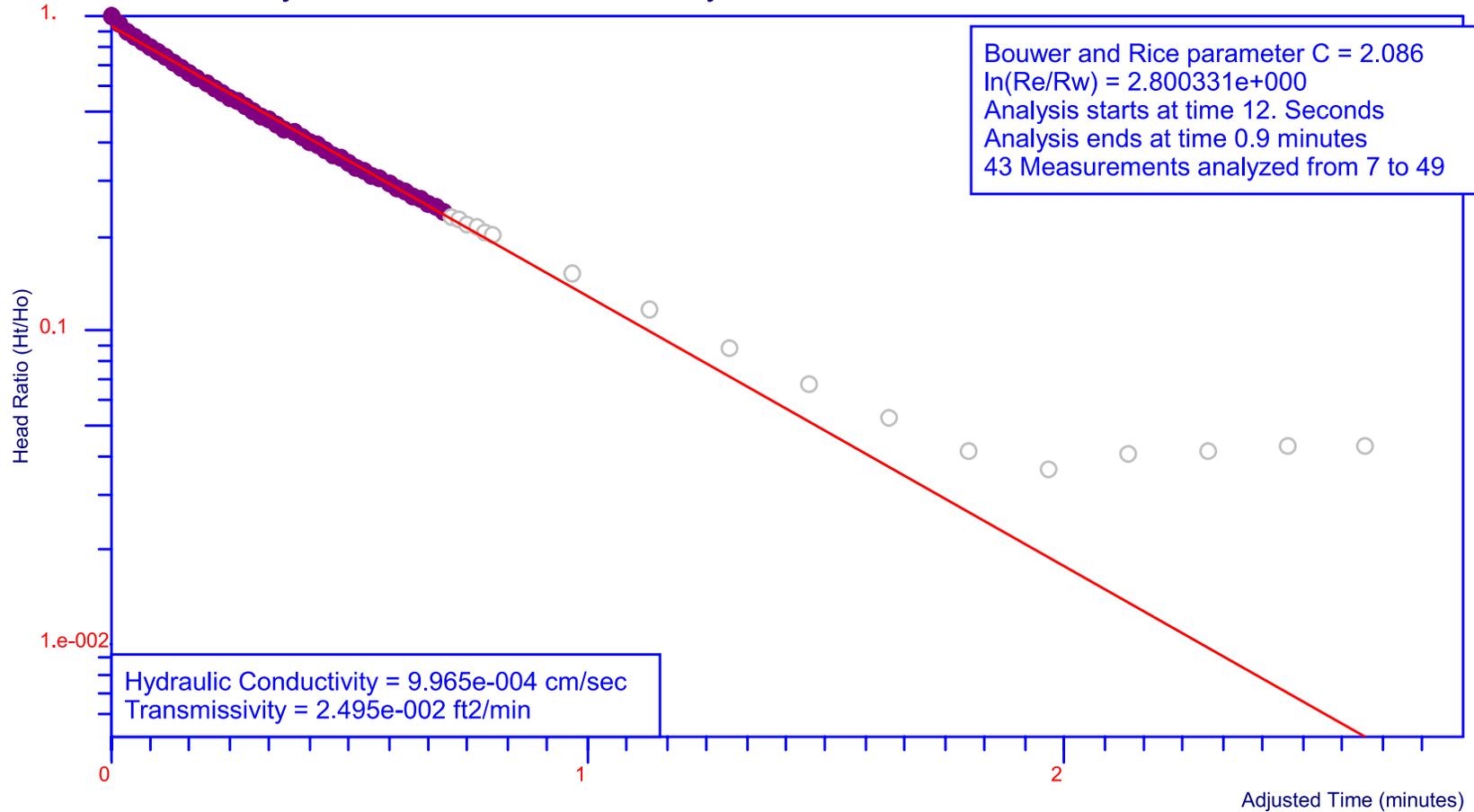
| | | | | | |
|----|-------|-------|----------|----------|------------|
| 59 | 2.5 | 2.283 | 0.127 | 0.127 | 5.109e-002 |
| 60 | 2.667 | 2.45 | 0.115 | 0.115 | 4.626e-002 |
| 61 | 2.833 | 2.617 | 0.106 | 0.106 | 4.264e-002 |
| 62 | 3. | 2.783 | 9.8e-002 | 9.8e-002 | 3.942e-002 |
| 63 | 3.167 | 2.95 | 9.1e-002 | 9.1e-002 | 3.66e-002 |
| 64 | 3.333 | 3.117 | 8.5e-002 | 8.5e-002 | 3.419e-002 |
| 65 | 3.5 | 3.283 | 8.e-002 | 8.e-002 | 3.218e-002 |
| 66 | 3.667 | 3.45 | 7.4e-002 | 7.4e-002 | 2.977e-002 |
| 67 | 3.833 | 3.617 | 7.e-002 | 7.e-002 | 2.816e-002 |
| 68 | 4. | 3.783 | 6.4e-002 | 6.4e-002 | 2.574e-002 |
| 69 | 4.167 | 3.95 | 5.9e-002 | 5.9e-002 | 2.373e-002 |
| 70 | 4.333 | 4.117 | 5.4e-002 | 5.4e-002 | 2.172e-002 |
| 71 | 4.5 | 4.283 | 5.1e-002 | 5.1e-002 | 2.051e-002 |
| 72 | 4.667 | 4.45 | 4.7e-002 | 4.7e-002 | 1.891e-002 |
| 73 | 4.833 | 4.617 | 4.5e-002 | 4.5e-002 | 1.81e-002 |
| 74 | 5. | 4.783 | 4.2e-002 | 4.2e-002 | 1.689e-002 |
| 75 | 5.167 | 4.95 | 3.8e-002 | 3.8e-002 | 1.529e-002 |
| 76 | 5.333 | 5.117 | 3.3e-002 | 3.3e-002 | 1.327e-002 |

Rising Head Slug Test April 17, 2024

Chambers County Landfill Chambers County, GA

Bouwer and Rice Graph

BLE-6



Project Number: J23-18020-02 for Chambers County Landfill, LLC
Analysis by BLE Inc.

H_o is 1.736 feet at 12. Seconds

Rising Head Slug Test

Site Name: Chambers County Landfill
 Location: Chambers County, GA
 Test Date: April 17, 2024
 Client: Chambers County Landfill, LLC
 Project Number: J23-18020-02
 Import File: \\blegvlfs1\SolidWasteProjects\Chambers County AL\18020-02 Limited Hydro\10 Slug Testing\Final\BLE-6 RH

Well Label: BLE-6
 Aquifer Thickness: 12.72 feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 3.625 Inches
 Static Water Level: 0. feet
 Water Table to Screen Bottom: 12.72 feet
 Anisotropy Ratio: 1.
 Time Adjustment: 12. Seconds

Test starts with trial 0

There are 66 time and drawdown measurements

Maximum head is 3.192 feet

Minimum head is 0. feet

| Trial | Time (minutes) | Adjusted Time (minutes) | Drawdown (feet) | Head (feet) | Head Ratio |
|-------|-------------------|----------------------------|--------------------|----------------|------------|
| 1 | 0.1 | -0.1 | 3.192 | 3.192 | 1. |
| 2 | 0.1167 | -8.333e-002 | 2.813 | 2.813 | 0.8813 |
| 3 | 0.1333 | -6.667e-002 | 2.506 | 2.506 | 0.7851 |
| 4 | 0.15 | -5.e-002 | 2.242 | 2.242 | 0.7024 |
| 5 | 0.1667 | -3.333e-002 | 2.029 | 2.029 | 0.6357 |
| 6 | 0.1833 | -1.667e-002 | 1.861 | 1.861 | 0.583 |
| 7 | 0.2 | 0. | 1.736 | 1.736 | 0.5439 |
| 8 | 0.2167 | 1.667e-002 | 1.643 | 1.643 | 0.5147 |
| 9 | 0.2333 | 3.333e-002 | 1.568 | 1.568 | 0.4912 |
| 10 | 0.25 | 5.e-002 | 1.502 | 1.502 | 0.4706 |
| 11 | 0.2667 | 6.667e-002 | 1.441 | 1.441 | 0.4514 |
| 12 | 0.2833 | 8.333e-002 | 1.385 | 1.385 | 0.4339 |
| 13 | 0.3 | 1.e-001 | 1.333 | 1.333 | 0.4176 |
| 14 | 0.3167 | 0.1167 | 1.284 | 1.284 | 0.4023 |
| 15 | 0.3333 | 0.1333 | 1.237 | 1.237 | 0.3875 |
| 16 | 0.35 | 0.15 | 1.193 | 1.193 | 0.3737 |
| 17 | 0.3667 | 0.1667 | 1.146 | 1.146 | 0.359 |

Chambers County Landfill

| | | | | | |
|----|--------|--------|-------|-------|------------|
| 18 | 0.3833 | 0.1833 | 1.107 | 1.107 | 0.3468 |
| 19 | 0.4 | 0.2 | 1.068 | 1.068 | 0.3346 |
| 20 | 0.4167 | 0.2167 | 1.032 | 1.032 | 0.3233 |
| 21 | 0.4333 | 0.2333 | 0.997 | 0.997 | 0.3123 |
| 22 | 0.45 | 0.25 | 0.964 | 0.964 | 0.302 |
| 23 | 0.4667 | 0.2667 | 0.933 | 0.933 | 0.2923 |
| 24 | 0.4833 | 0.2833 | 0.902 | 0.902 | 0.2826 |
| 25 | 0.5 | 0.3 | 0.873 | 0.873 | 0.2735 |
| 26 | 0.5167 | 0.3167 | 0.844 | 0.844 | 0.2644 |
| 27 | 0.5333 | 0.3333 | 0.817 | 0.817 | 0.256 |
| 28 | 0.55 | 0.35 | 0.793 | 0.793 | 0.2484 |
| 29 | 0.5667 | 0.3667 | 0.767 | 0.767 | 0.2403 |
| 30 | 0.5833 | 0.3833 | 0.744 | 0.744 | 0.2331 |
| 31 | 0.6 | 0.4 | 0.72 | 0.72 | 0.2256 |
| 32 | 0.6167 | 0.4167 | 0.697 | 0.697 | 0.2184 |
| 33 | 0.6333 | 0.4333 | 0.675 | 0.675 | 0.2115 |
| 34 | 0.65 | 0.45 | 0.654 | 0.654 | 0.2049 |
| 35 | 0.6667 | 0.4667 | 0.634 | 0.634 | 0.1986 |
| 36 | 0.6833 | 0.4833 | 0.614 | 0.614 | 0.1924 |
| 37 | 0.7 | 0.5 | 0.596 | 0.596 | 0.1867 |
| 38 | 0.7167 | 0.5167 | 0.577 | 0.577 | 0.1808 |
| 39 | 0.7333 | 0.5333 | 0.561 | 0.561 | 0.1758 |
| 40 | 0.75 | 0.55 | 0.543 | 0.543 | 0.1701 |
| 41 | 0.7667 | 0.5667 | 0.528 | 0.528 | 0.1654 |
| 42 | 0.7833 | 0.5833 | 0.512 | 0.512 | 0.1604 |
| 43 | 0.8 | 0.6 | 0.496 | 0.496 | 0.1554 |
| 44 | 0.8167 | 0.6167 | 0.482 | 0.482 | 0.151 |
| 45 | 0.8333 | 0.6333 | 0.469 | 0.469 | 0.1469 |
| 46 | 0.85 | 0.65 | 0.456 | 0.456 | 0.1429 |
| 47 | 0.8667 | 0.6667 | 0.442 | 0.442 | 0.1385 |
| 48 | 0.8833 | 0.6833 | 0.43 | 0.43 | 0.1347 |
| 49 | 0.9 | 0.7 | 0.417 | 0.417 | 0.1306 |
| 50 | 0.9167 | 0.7167 | 0.404 | 0.404 | 0.1266 |
| 51 | 0.9333 | 0.7333 | 0.393 | 0.393 | 0.1231 |
| 52 | 0.95 | 0.75 | 0.382 | 0.382 | 0.1197 |
| 53 | 0.9667 | 0.7667 | 0.371 | 0.371 | 0.1162 |
| 54 | 0.9833 | 0.7833 | 0.36 | 0.36 | 0.1128 |
| 55 | 1. | 0.8 | 0.351 | 0.351 | 0.11 |
| 56 | 1.167 | 0.9667 | 0.265 | 0.265 | 8.302e-002 |
| 57 | 1.333 | 1.133 | 0.201 | 0.201 | 6.297e-002 |
| 58 | 1.5 | 1.3 | 0.154 | 0.154 | 4.825e-002 |

Chambers County Landfill

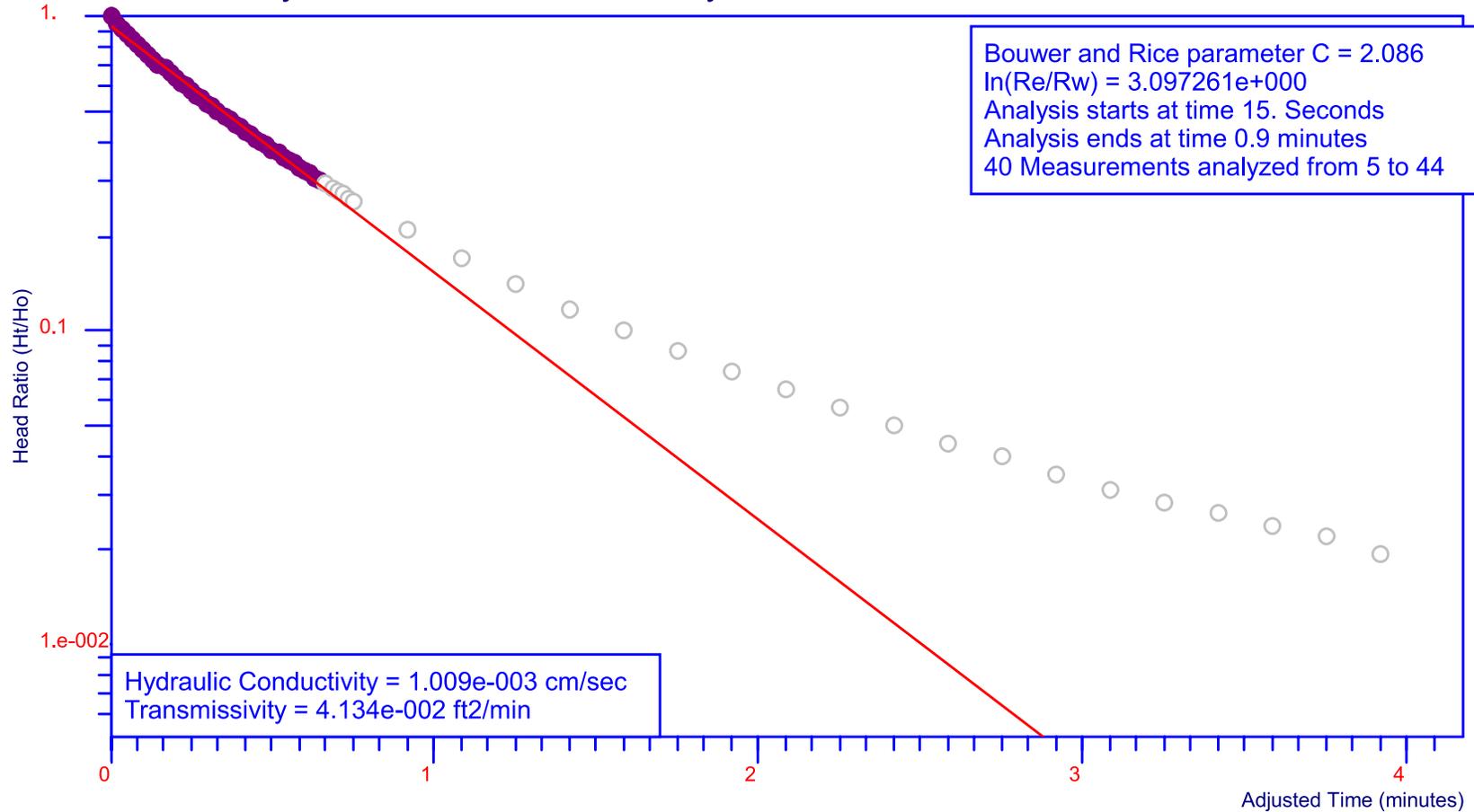
| | | | | | |
|----|-------|-------|----------|----------|------------|
| 59 | 1.667 | 1.467 | 0.118 | 0.118 | 3.697e-002 |
| 60 | 1.833 | 1.633 | 9.1e-002 | 9.1e-002 | 2.851e-002 |
| 61 | 2. | 1.8 | 7.1e-002 | 7.1e-002 | 2.224e-002 |
| 62 | 2.167 | 1.967 | 6.3e-002 | 6.3e-002 | 1.974e-002 |
| 63 | 2.333 | 2.133 | 7.e-002 | 7.e-002 | 2.193e-002 |
| 64 | 2.5 | 2.3 | 7.2e-002 | 7.2e-002 | 2.256e-002 |
| 65 | 2.667 | 2.467 | 7.4e-002 | 7.4e-002 | 2.318e-002 |
| 66 | 2.833 | 2.633 | 7.4e-002 | 7.4e-002 | 2.318e-002 |

Falling Head Slug Test April 17, 2024

Chambers County Landfill Chambers County, GA

Bouwer and Rice Graph

BLE-7



Project Number: J23-18020-02 for Chambers County Landfill, LLC
Analysis by BLE Inc.

Ho is 2.234 feet at 15. Seconds

Falling Head Slug Test

Site Name: Chambers County Landfill
 Location: Chambers County, GA
 Test Date: April 17, 2024
 Client: Chambers County Landfill, LLC
 Project Number: J23-18020-02
 Import File: \\blegvlfs1\SolidWasteProjects\Chambers County AL\18020-02 Limited Hydro\10 Slug Testing\Final\BLE-7 FH.

Well Label: BLE-7
 Aquifer Thickness: 20.82 feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 3.625 Inches
 Static Water Level: 0. feet
 Water Table to Screen Bottom: 20.82 feet
 Anisotropy Ratio: 1.
 Time Adjustment: 15. Seconds

Test starts with trial 0

There are 69 time and drawdown measurements

Maximum head is 3.923 feet

Minimum head is 0. feet

| Trial | Time (minutes) | Adjusted Time (minutes) | Drawdown (feet) | Head (feet) | Head Ratio |
|-------|-------------------|----------------------------|--------------------|----------------|------------|
| 1 | 0.1833 | -6.667e-002 | 3.923 | 3.923 | 1. |
| 2 | 0.2 | -5.e-002 | 3.143 | 3.143 | 0.8012 |
| 3 | 0.2167 | -3.333e-002 | 2.633 | 2.633 | 0.6712 |
| 4 | 0.2333 | -1.667e-002 | 2.324 | 2.324 | 0.5924 |
| 5 | 0.25 | 0. | 2.234 | 2.234 | 0.5695 |
| 6 | 0.2667 | 1.667e-002 | 2.145 | 2.145 | 0.5468 |
| 7 | 0.2833 | 3.333e-002 | 2.061 | 2.061 | 0.5254 |
| 8 | 0.3 | 5.e-002 | 1.981 | 1.981 | 0.505 |
| 9 | 0.3167 | 6.667e-002 | 1.901 | 1.901 | 0.4846 |
| 10 | 0.3333 | 8.333e-002 | 1.83 | 1.83 | 0.4665 |
| 11 | 0.35 | 1.e-001 | 1.763 | 1.763 | 0.4494 |
| 12 | 0.3667 | 0.1167 | 1.699 | 1.699 | 0.4331 |
| 13 | 0.3833 | 0.1333 | 1.637 | 1.637 | 0.4173 |
| 14 | 0.4 | 0.15 | 1.589 | 1.589 | 0.405 |
| 15 | 0.4167 | 0.1667 | 1.537 | 1.537 | 0.3918 |
| 16 | 0.4333 | 0.1833 | 1.484 | 1.484 | 0.3783 |
| 17 | 0.45 | 0.2 | 1.435 | 1.435 | 0.3658 |

Chambers County Landfill

| | | | | | |
|----|--------|--------|-------|-------|------------|
| 18 | 0.4667 | 0.2167 | 1.389 | 1.389 | 0.3541 |
| 19 | 0.4833 | 0.2333 | 1.344 | 1.344 | 0.3426 |
| 20 | 0.5 | 0.25 | 1.302 | 1.302 | 0.3319 |
| 21 | 0.5167 | 0.2667 | 1.263 | 1.263 | 0.3219 |
| 22 | 0.5333 | 0.2833 | 1.224 | 1.224 | 0.312 |
| 23 | 0.55 | 0.3 | 1.188 | 1.188 | 0.3028 |
| 24 | 0.5667 | 0.3167 | 1.153 | 1.153 | 0.2939 |
| 25 | 0.5833 | 0.3333 | 1.12 | 1.12 | 0.2855 |
| 26 | 0.6 | 0.35 | 1.085 | 1.085 | 0.2766 |
| 27 | 0.6167 | 0.3667 | 1.055 | 1.055 | 0.2689 |
| 28 | 0.6333 | 0.3833 | 1.025 | 1.025 | 0.2613 |
| 29 | 0.65 | 0.4 | 0.997 | 0.997 | 0.2541 |
| 30 | 0.6667 | 0.4167 | 0.969 | 0.969 | 0.247 |
| 31 | 0.6833 | 0.4333 | 0.943 | 0.943 | 0.2404 |
| 32 | 0.7 | 0.45 | 0.917 | 0.917 | 0.2337 |
| 33 | 0.7167 | 0.4667 | 0.892 | 0.892 | 0.2274 |
| 34 | 0.7333 | 0.4833 | 0.868 | 0.868 | 0.2213 |
| 35 | 0.75 | 0.5 | 0.845 | 0.845 | 0.2154 |
| 36 | 0.7667 | 0.5167 | 0.824 | 0.824 | 0.21 |
| 37 | 0.7833 | 0.5333 | 0.802 | 0.802 | 0.2044 |
| 38 | 0.8 | 0.55 | 0.782 | 0.782 | 0.1993 |
| 39 | 0.8167 | 0.5667 | 0.762 | 0.762 | 0.1942 |
| 40 | 0.8333 | 0.5833 | 0.742 | 0.742 | 0.1891 |
| 41 | 0.85 | 0.6 | 0.724 | 0.724 | 0.1846 |
| 42 | 0.8667 | 0.6167 | 0.705 | 0.705 | 0.1797 |
| 43 | 0.8833 | 0.6333 | 0.688 | 0.688 | 0.1754 |
| 44 | 0.9 | 0.65 | 0.672 | 0.672 | 0.1713 |
| 45 | 0.9167 | 0.6667 | 0.654 | 0.654 | 0.1667 |
| 46 | 0.9333 | 0.6833 | 0.639 | 0.639 | 0.1629 |
| 47 | 0.95 | 0.7 | 0.624 | 0.624 | 0.1591 |
| 48 | 0.9667 | 0.7167 | 0.609 | 0.609 | 0.1552 |
| 49 | 0.9833 | 0.7333 | 0.594 | 0.594 | 0.1514 |
| 50 | 1. | 0.75 | 0.581 | 0.581 | 0.1481 |
| 51 | 1.167 | 0.9167 | 0.465 | 0.465 | 0.1185 |
| 52 | 1.333 | 1.083 | 0.378 | 0.378 | 9.635e-002 |
| 53 | 1.5 | 1.25 | 0.313 | 0.313 | 7.979e-002 |
| 54 | 1.667 | 1.417 | 0.262 | 0.262 | 6.679e-002 |
| 55 | 1.833 | 1.583 | 0.223 | 0.223 | 5.684e-002 |
| 56 | 2. | 1.75 | 0.192 | 0.192 | 4.894e-002 |
| 57 | 2.167 | 1.917 | 0.165 | 0.165 | 4.206e-002 |
| 58 | 2.333 | 2.083 | 0.144 | 0.144 | 3.671e-002 |

Chambers County Landfill

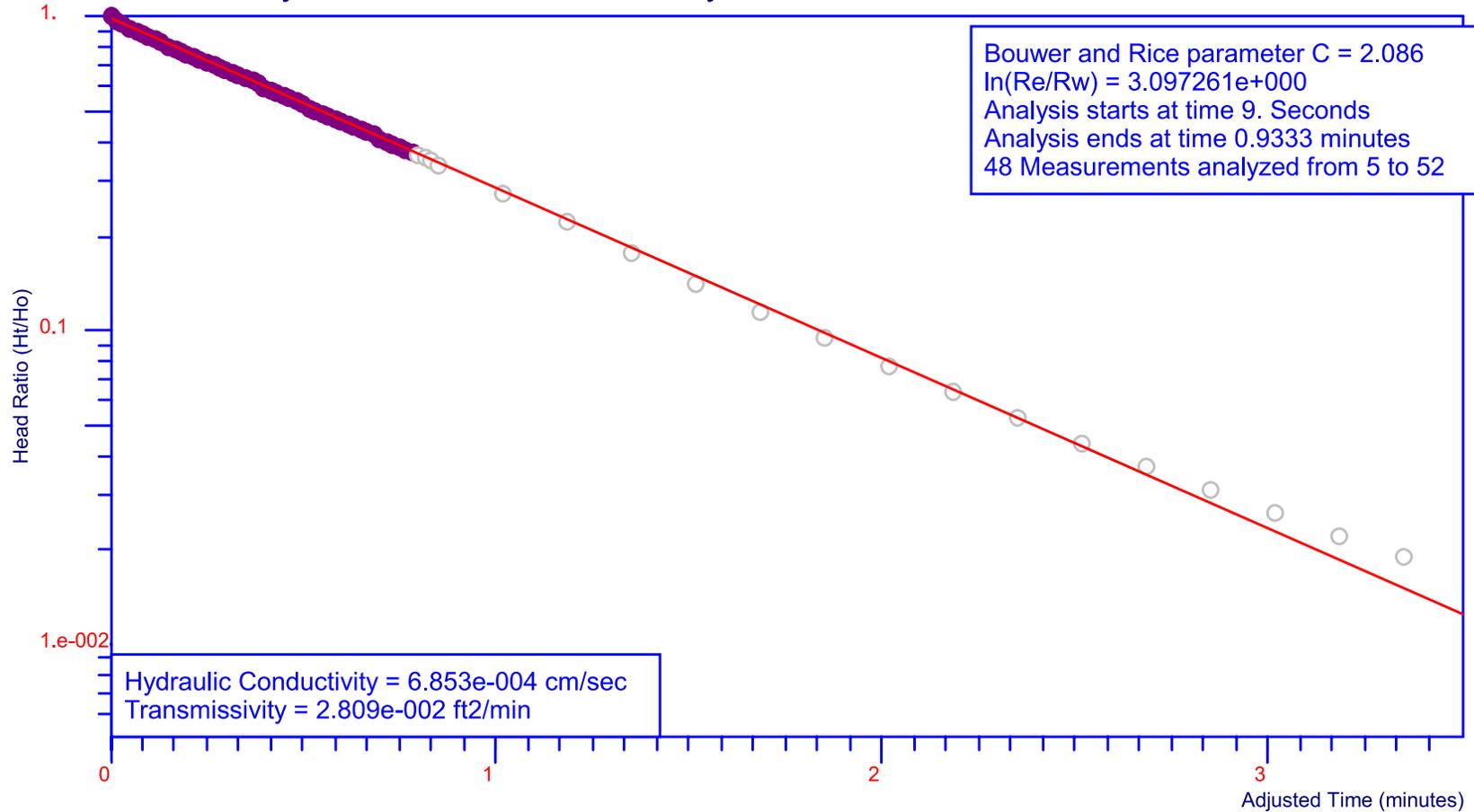
| | | | | | |
|----|-------|-------|----------|----------|------------|
| 59 | 2.5 | 2.25 | 0.126 | 0.126 | 3.212e-002 |
| 60 | 2.667 | 2.417 | 0.111 | 0.111 | 2.829e-002 |
| 61 | 2.833 | 2.583 | 9.8e-002 | 9.8e-002 | 2.498e-002 |
| 62 | 3. | 2.75 | 8.8e-002 | 8.8e-002 | 2.243e-002 |
| 63 | 3.167 | 2.917 | 7.8e-002 | 7.8e-002 | 1.988e-002 |
| 64 | 3.333 | 3.083 | 7.e-002 | 7.e-002 | 1.784e-002 |
| 65 | 3.5 | 3.25 | 6.3e-002 | 6.3e-002 | 1.606e-002 |
| 66 | 3.667 | 3.417 | 5.9e-002 | 5.9e-002 | 1.504e-002 |
| 67 | 3.833 | 3.583 | 5.3e-002 | 5.3e-002 | 1.351e-002 |
| 68 | 4. | 3.75 | 4.9e-002 | 4.9e-002 | 1.249e-002 |
| 69 | 4.167 | 3.917 | 4.3e-002 | 4.3e-002 | 1.096e-002 |

Rising Head Slug Test April 17, 2024

Chambers County Landfill Chambers County, GA

Bouwer and Rice Graph

BLE-7



Project Number: J23-18020-02 for Chambers County Landfill, LLC

Analysis by BLE Inc.

H_o is 2.785 feet at 9. Seconds

Rising Head Slug Test

Site Name: Chambers County Landfill
 Location: Chambers County, GA
 Test Date: April 17, 2024
 Client: Chambers County Landfill, LLC
 Project Number: J23-18020-02
 Import File: \\blegvlfs1\SolidWasteProjects\Chambers County AL\18020-02 Limited Hydro\10 Slug Testing\Final\BLE-7 RH

Well Label: BLE-7
 Aquifer Thickness: 20.82 feet
 Screen Length: 10. feet
 Casing Radius: 1. Inches
 Effective Radius: 3.625 Inches
 Static Water Level: 0. feet
 Water Table to Screen Bottom: 20.82 feet
 Anisotropy Ratio: 1.
 Time Adjustment: 9. Seconds

Test starts with trial 0

There are 71 time and drawdown measurements

Maximum head is 3.408 feet

Minimum head is 0. feet

| Trial | Time (minutes) | Adjusted Time (minutes) | Drawdown (feet) | Head (feet) | Head Ratio |
|-------|-------------------|----------------------------|--------------------|----------------|------------|
| 1 | 8.333e-002 | -6.667e-002 | 3.408 | 3.408 | 1. |
| 2 | 0.1 | -5.e-002 | 3.146 | 3.146 | 0.9231 |
| 3 | 0.1167 | -3.333e-002 | 2.99 | 2.99 | 0.8773 |
| 4 | 0.1333 | -1.667e-002 | 2.883 | 2.883 | 0.846 |
| 5 | 0.15 | 0. | 2.785 | 2.785 | 0.8172 |
| 6 | 0.1667 | 1.667e-002 | 2.709 | 2.709 | 0.7949 |
| 7 | 0.1833 | 3.333e-002 | 2.641 | 2.641 | 0.7749 |
| 8 | 0.2 | 5.e-002 | 2.579 | 2.579 | 0.7567 |
| 9 | 0.2167 | 6.667e-002 | 2.518 | 2.518 | 0.7388 |
| 10 | 0.2333 | 8.333e-002 | 2.462 | 2.462 | 0.7224 |
| 11 | 0.25 | 0.1 | 2.408 | 2.408 | 0.7066 |
| 12 | 0.2667 | 0.1167 | 2.358 | 2.358 | 0.6919 |
| 13 | 0.2833 | 0.1333 | 2.309 | 2.309 | 0.6775 |
| 14 | 0.3 | 0.15 | 2.261 | 2.261 | 0.6634 |
| 15 | 0.3167 | 0.1667 | 2.216 | 2.216 | 0.6502 |
| 16 | 0.3333 | 0.1833 | 2.17 | 2.17 | 0.6367 |
| 17 | 0.35 | 0.2 | 2.127 | 2.127 | 0.6241 |

Chambers County Landfill

| | | | | | |
|----|--------|--------|-------|-------|--------|
| 18 | 0.3667 | 0.2167 | 2.082 | 2.082 | 0.6109 |
| 19 | 0.3833 | 0.2333 | 2.04 | 2.04 | 0.5986 |
| 20 | 0.4 | 0.25 | 1.999 | 1.999 | 0.5866 |
| 21 | 0.4167 | 0.2667 | 1.959 | 1.959 | 0.5748 |
| 22 | 0.4333 | 0.2833 | 1.919 | 1.919 | 0.5631 |
| 23 | 0.45 | 0.3 | 1.874 | 1.874 | 0.5499 |
| 24 | 0.4667 | 0.3167 | 1.838 | 1.838 | 0.5393 |
| 25 | 0.4833 | 0.3333 | 1.803 | 1.803 | 0.529 |
| 26 | 0.5 | 0.35 | 1.769 | 1.769 | 0.5191 |
| 27 | 0.5167 | 0.3667 | 1.736 | 1.736 | 0.5094 |
| 28 | 0.5333 | 0.3833 | 1.704 | 1.704 | 0.5 |
| 29 | 0.55 | 0.4 | 1.67 | 1.67 | 0.49 |
| 30 | 0.5667 | 0.4167 | 1.637 | 1.637 | 0.4803 |
| 31 | 0.5833 | 0.4333 | 1.603 | 1.603 | 0.4704 |
| 32 | 0.6 | 0.45 | 1.57 | 1.57 | 0.4607 |
| 33 | 0.6167 | 0.4667 | 1.535 | 1.535 | 0.4504 |
| 34 | 0.6333 | 0.4833 | 1.501 | 1.501 | 0.4404 |
| 35 | 0.65 | 0.5 | 1.468 | 1.468 | 0.4308 |
| 36 | 0.6667 | 0.5167 | 1.434 | 1.434 | 0.4208 |
| 37 | 0.6833 | 0.5333 | 1.405 | 1.405 | 0.4123 |
| 38 | 0.7 | 0.55 | 1.376 | 1.376 | 0.4038 |
| 39 | 0.7167 | 0.5667 | 1.348 | 1.348 | 0.3955 |
| 40 | 0.7333 | 0.5833 | 1.32 | 1.32 | 0.3873 |
| 41 | 0.75 | 0.6 | 1.293 | 1.293 | 0.3794 |
| 42 | 0.7667 | 0.6167 | 1.268 | 1.268 | 0.3721 |
| 43 | 0.7833 | 0.6333 | 1.241 | 1.241 | 0.3641 |
| 44 | 0.8 | 0.65 | 1.216 | 1.216 | 0.3568 |
| 45 | 0.8167 | 0.6667 | 1.192 | 1.192 | 0.3498 |
| 46 | 0.8333 | 0.6833 | 1.167 | 1.167 | 0.3424 |
| 47 | 0.85 | 0.7 | 1.143 | 1.143 | 0.3354 |
| 48 | 0.8667 | 0.7167 | 1.12 | 1.12 | 0.3286 |
| 49 | 0.8833 | 0.7333 | 1.096 | 1.096 | 0.3216 |
| 50 | 0.9 | 0.75 | 1.074 | 1.074 | 0.3151 |
| 51 | 0.9167 | 0.7667 | 1.05 | 1.05 | 0.3081 |
| 52 | 0.9333 | 0.7833 | 1.029 | 1.029 | 0.3019 |
| 53 | 0.95 | 0.8 | 1.006 | 1.006 | 0.2952 |
| 54 | 0.9667 | 0.8167 | 0.987 | 0.987 | 0.2896 |
| 55 | 0.9833 | 0.8333 | 0.966 | 0.966 | 0.2835 |
| 56 | 1. | 0.85 | 0.946 | 0.946 | 0.2776 |
| 57 | 1.167 | 1.017 | 0.763 | 0.763 | 0.2239 |
| 58 | 1.333 | 1.183 | 0.615 | 0.615 | 0.1805 |

Chambers County Landfill

| | | | | | |
|----|-------|-------|----------|----------|------------|
| 59 | 1.5 | 1.35 | 0.494 | 0.494 | 0.145 |
| 60 | 1.667 | 1.517 | 0.396 | 0.396 | 0.1162 |
| 61 | 1.833 | 1.683 | 0.32 | 0.32 | 9.39e-002 |
| 62 | 2. | 1.85 | 0.262 | 0.262 | 7.688e-002 |
| 63 | 2.167 | 2.017 | 0.215 | 0.215 | 6.309e-002 |
| 64 | 2.333 | 2.183 | 0.176 | 0.176 | 5.164e-002 |
| 65 | 2.5 | 2.35 | 0.147 | 0.147 | 4.313e-002 |
| 66 | 2.667 | 2.517 | 0.121 | 0.121 | 3.55e-002 |
| 67 | 2.833 | 2.683 | 0.102 | 0.102 | 2.993e-002 |
| 68 | 3. | 2.85 | 8.6e-002 | 8.6e-002 | 2.523e-002 |
| 69 | 3.167 | 3.017 | 7.3e-002 | 7.3e-002 | 2.142e-002 |
| 70 | 3.333 | 3.183 | 6.2e-002 | 6.2e-002 | 1.819e-002 |
| 71 | 3.5 | 3.35 | 5.3e-002 | 5.3e-002 | 1.555e-002 |

APPENDIX E

Resumes

Years of Experience

33

Education

Graduate Studies,
Geology/Hydrogeology,
Texas A&M University
(1988-1990)

B.S. Geology,
University of South
Carolina (1988)

Registrations &
Certifications

Professional Geologist -
AL, FL, GA, IN, LA, MS,
NC, SC, TN

Registered Site
Manager - NC

OSHA - Hazardous
Waste Operations and
Emergency Response
Certification

Career Summary

Mr. Alexander co-founded Bunnell-Lammons Engineering, Inc. (BLE) in Greenville, SC in 1996. Prior to his association with BLE, Mr. Alexander was employed by a large international engineering consulting company. Mr. Alexander currently serves as a Consultant Hydrogeologist specializing in solid waste facility siting, environmental assessments, remediation, and compliance.

These projects include landfill siting and expansions, soil and groundwater contaminated with petroleum hydrocarbons, chlorinated solvents, and metals by landfill gas and landfill leachate. These projects include numerous Assessments of Corrective Measures (ACM) and Corrective Action Plans (CAP). Mr. Alexander has developed and implemented various assessment programs that include: monitoring and recovery well installation, Tier 2 landfill gas sampling, field sampling programs, groundwater flow and contaminant transport modeling, aquifer testing, geologic mapping, geostatistics, and computer-aided soils analysis.

Additionally, Mr. Alexander has performed testing and analysis for environmental remediation system permitting, design, and installation. Mr. Alexander has also coordinated and performed operation and maintenance activities including the preparation of monitoring reports for active remediation systems. Mr. Alexander has completed numerous Site Hydrogeologic and Design Hydrogeologic Investigations (SHR & DHR).

Mr. Alexander has also prepared permits and other regulatory documents including alternate source demonstrations (ASD), water quality monitoring plans (WQMP), landfill gas monitoring plans (LFGMP), alternate groundwater protection standards (AGWPS), storm water pollution prevention plans (SWPPP), and spill prevention, control, and countermeasure plans (SPCC) for a wide variety of industrial, private, and public-sector clients.

Professional Membership + Associations

Division of Scientist and Engineers – NGWA

**Years of Experience**

9

Education

B.A. Geology, The
College of Wooster
(2015)

Certifications

Professional Geologist
– SC, NC, GA, TN

40-Hour HAZWOPER,
8-Hour Supervisor,
annual 8-Hour
refreshers

Career Summary

Mr. Downes currently serves as a Project Geologist specializing in hydrogeologic evaluations for proposed and existing landfills. He conducts field investigations, reporting, and regulatory compliance related to siting landfills including site hydrogeologic and design hydrogeologic investigations, geologic observations, and the establishment of Environmental Monitoring Plans.

Project Experience

- **Private Landfills – North Carolina**

Mr. Downes co-authored reports associated with lateral expansions of Municipal Solid Waste Landfills. He also designed Water Quality Monitoring Plans and Landfill Gas Monitoring Plans.

- **Private Landfills – Georgia, Alabama**

Mr. Downes managed fieldwork associated with lateral expansions of Municipal Solid Waste Landfills and co-authored the reports. He also designed Water Quality Monitoring Plans and Landfill Gas Monitoring Plans.

- **County Landfills – Georgia, Alabama**

Mr. Downes managed fieldwork associated with lateral expansions of Construction & Demolition Landfills and co-authored the reports. He also designed Water Quality Monitoring Plans and Landfill Gas Monitoring Plans.

Attachment D

TerraXplorations, Inc. Phase I Cultural Resources Report

**Siting Standards
Chambers County Landfill
May 2024**

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A PHASE I CULTURAL RESOURCES SURVEY FOR THE
PROPOSED EXPANSION OF THE CHAMBERS COUNTY
LANDFILL IN CHAMBERS COUNTY, ALABAMA

PREPARED BY
TERRAXPLORATIONS, INC.

PREPARED FOR
CHAMBERS COUNTY LANDFILL, LLC



✓ Helping our clients through
the cultural resource process

★ Doing the best job
in every situation

➔ Advancing
our employees

APRIL 2024

TerraXplorations, Inc.
3120 University
Boulevard E,
Tuscaloosa, AL 35404
TerraXplorations.com

Chambers County Landfill, LLC
P.O. Box 86
West Point, GA, 31833

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A PHASE I CULTURAL RESOURCES SURVEY FOR THE
PROPOSED EXPANSION OF THE CHAMBERS COUNTY
LANDFILL IN CHAMBERS COUNTY, ALABAMA

BY

EMMA JACKSON PEPPERMAN,
CATHERINE TAUNTON STRADER,
CRISTYN MAXEY, ZACKARIAH D. PAGELS,
& MISTY ROVENELLI-RATTY

PREPARED BY
TERRAXPLORATIONS, INC.
3120 UNIVERSITY BLVD E
TUSCALOOSA, AL 35404

PREPARED FOR
CHAMBERS COUNTY LANDFILL, LLC
P.O. BOX 86
WEST POINT, GA 3183

PRINCIPAL INVESTIGATOR

EMMA JACKSON PEPPERMAN

A handwritten signature in black ink, appearing to read "Emma J. Pepperman". The signature is fluid and cursive, with a large initial "E" and "P".

TERRAX PROJECT NUMBER
24039

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INTRODUCTION

TerraXplorations, Inc. (TerraX) of Tuscaloosa, Alabama was contracted by Chambers County Landfill, LLC to conduct a cultural resources survey for the proposed Industrial Waste Landfill in Chambers County, Alabama. The Phase I survey was performed between March 18 and March 22, 2024. Emma Jackson Pepperman served as the Principal Investigator and was assisted in the field by Cheyenne Davis and Jordan Jones. The purpose of this study was to determine if any prehistoric or historic properties exist within the limits of the survey area and, if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria.

The proposed project is an expansion of an industrial waste landfill that accepts construction and demolition waste as well as ADEM-approved specific industrial waste that qualifies as C&D waste. As there is currently no federal involvement in this project, Chambers County Landfill, LLC requested an archeological survey in order to meet cultural resources due diligence standards.

The project area is located in a rural area southeast of the city of LaFayette, Alabama and west of the town of Lanett, 5.7 miles (mi) west of the Chattahoochee River along Highway 50/Veterans Memorial Parkway. The project area consists of two noncontiguous tracts, an eastern and western portion. The east and west project tracts are separated by a landfill and an unnamed service road that runs north to south. The western tract is bounded on the north and west by a landfill access road. Veterans Memorial Parkway runs along the northern boundary of the eastern tract.

The project area consists of a total of approximately 69.4 acres (ac) (28.1 hectares [ha]), of which 26 ac lie in the western tract and 43 ac in the eastern tract (Figure 1). The direct Area of Potential Effect (APE) is the same as the project area, and the indirect APE includes the subject property and adjacent properties found within a 150-foot (ft) radius. The subject property and surrounding area can be found on the 1971 (1984 edition [ed.]) Cusseta, Alabama United States Geological Survey (USGS) 1:24,000 series topographic quadrangle (Figure 2).

PROJECT AREA ENVIRONMENT

The project area is situated within the Piedmont ecoregion and the southern outer Piedmont sub-ecoregions. The Piedmont region, viewed as the flatter part of the old Appalachian Highland, sits between the mountainous Appalachians to the northwest and the flat coastal plain to the southeast. It contains a mix of Precambrian and Paleozoic metamorphic and igneous rocks, with some hills and moderately dissected plains. Once heavily farmed, much of this area has since become pine and hardwood forests. The soil here is usually finer than in the coastal plain regions (Griffith et al. 2001). The sub-ecoregion of the “southern outer Piedmont” refers to the area’s lower elevations, gentle relief, and reduced precipitation levels compared to other areas within the Piedmont ecoregion. The dominant forest type is loblolly-shortleaf pine, and there are fewer oak-hickory and oak-pine forests than in the southern inner Piedmont. Common rock types include gneiss, schist, and granite, often covered by deep saprolite and primarily red, clayey subsoils. Most soils in the Piedmont ecoregion are classified as Kanhapludults. Its southern boundary aligns with the Fall Line, where unconsolidated coastal plain sediments overlay the metamorphic and igneous rocks of the Piedmont region (Griffith et al. 2001).

Elevations in the project area range between 215 meters (m) (705.4 ft) above mean sea level (AMSL) and 240 m (787.4 ft) above mean sea level, with an average elevation of 230 m (754.6 ft) AMSL. The lowest elevations occur in the eastern portion of the project area, with the higher elevations in the west. The total project area is a gently sloping landform consisting mainly of mixed hardwoods with moderate-density pine forests. Light underbrush is consistent throughout the area. However, variations in vegetation observed in

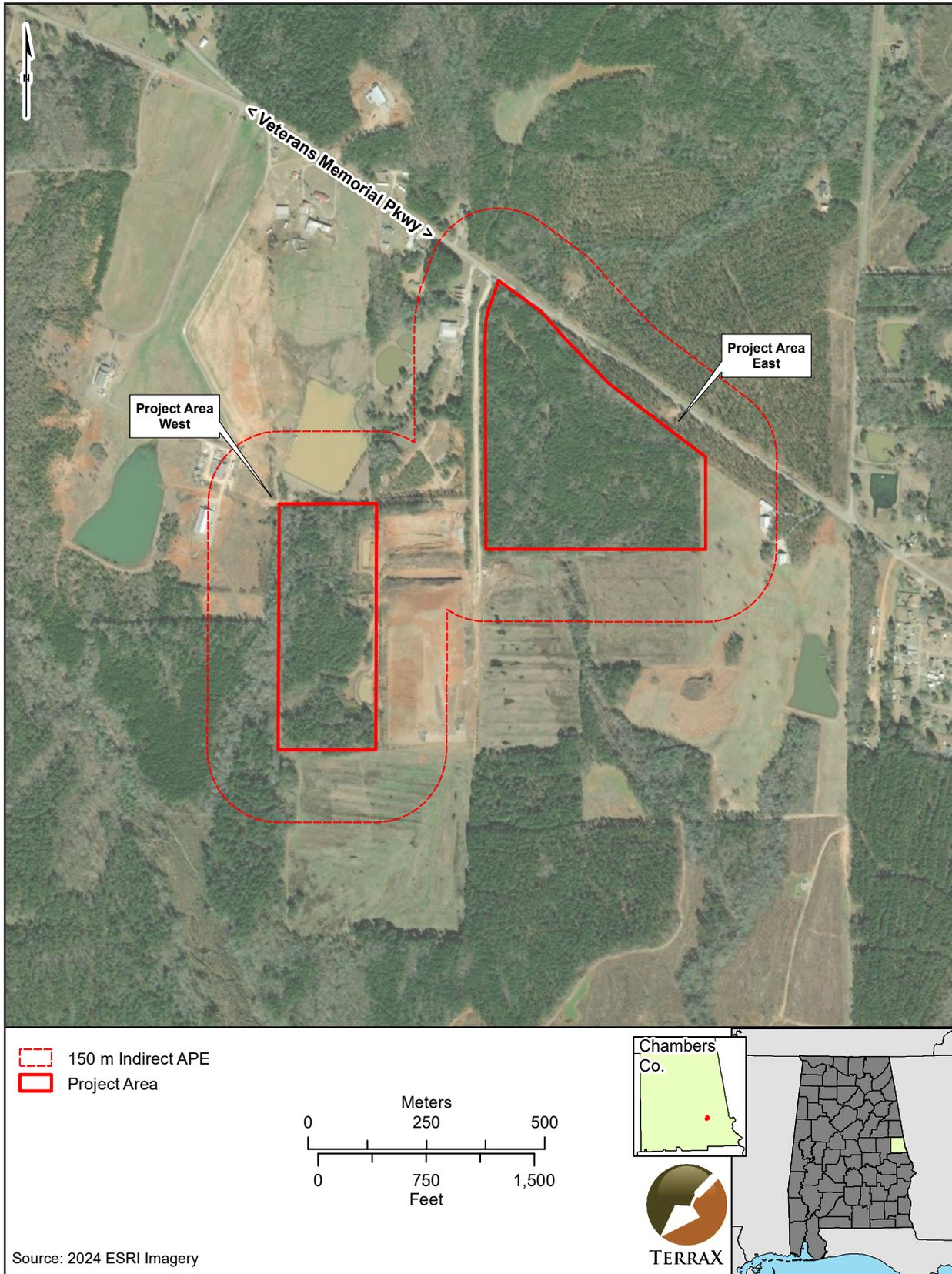


Figure 1. Aerial map showing the project area.

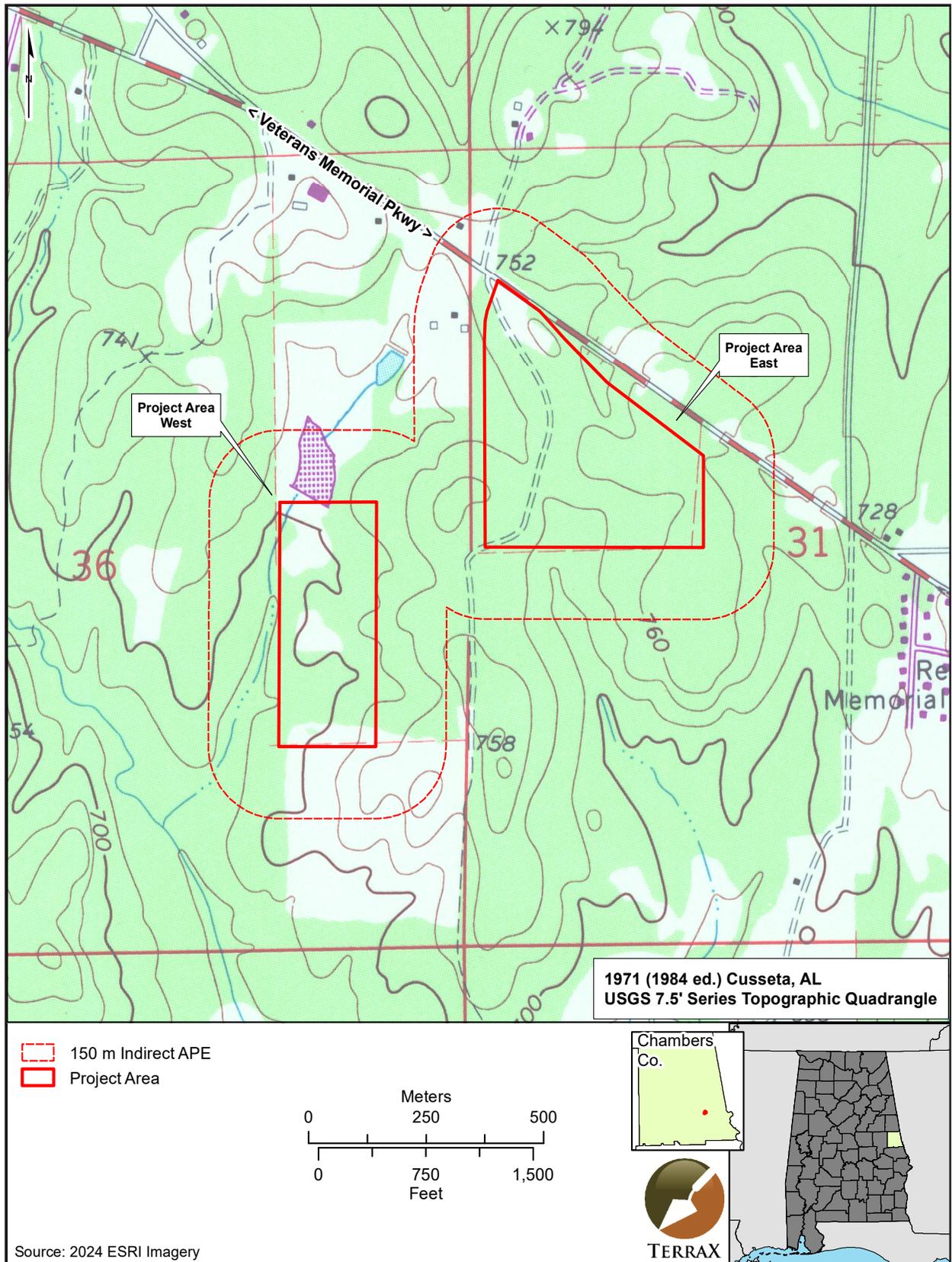


Figure 2. Topographic map showing the project area.

disturbed areas such as clearings and roads are visible on the maps. Surface visibility in the area ranges from moderate to fair. In the west-southwest portion of the project area, isolated areas of steep ravines were noted, likely resulting from runoff from water or retention ponds associated with landfills and clearings. In the project area's eastern section are dried runoff creek beds and wetlands marked by flagging tape. Throughout the project area, several access roads are present. Clearings and logging debris are evident along these roads, likely stemming from well installation activities. Additionally, large piles of pine resulting from clearing efforts can be observed along these access routes. Modern trash and debris (materials produced after 1974) were found sparsely throughout the PA sections, but were most densely located around the road ways. Surveyors determined that all trash found is linked to landfill activities and is of no cultural significance. Photographs depicting the present condition of the land within the project limits are provided (Figures 3-8).

A review of the United States Department of Agriculture (USDA) Web Soil Survey (USDA 2024) identified 13 soil types within the project area (Figure 9 and 10). Gullied land, Lloyd gravelly clay loam, severely eroded, sloping, and Cecil sandy loam, 6 to 10 percent slopes, moderately eroded, comprise the largest coverage and account for 55.1% of the project area. Lloyd gravelly clay loam, severely eroded and sloping, comprises the largest coverage of the 13 soil types and accounts for 17.9% of the project area. This is a well-drained and moderately permeable soil, and its parent material consists of residuum from igneous and metamorphic rocks. A typical profile consists of six soil horizons: an Ap horizon consisting of 0 to 9 inches of loam, a Bt1 horizon consisting of 9 to 17 inches of clay loam, a Bt2 horizon consisting of 17 to 33 inches of clay, a Bt3 horizon consisting of 33 to 46 inches of clay, a BC horizon consisting of 46 to 56 inches of clay loam, and a C horizon consisting of 56 to 72 inches of saprolite that crushes to loam. Cecil sandy loam, 6 to 10 percent slopes, moderately eroded, comprises the second largest coverage of the 13 soil types and accounts for 11.2% of the project area. This is a well-drained and moderately permeable soil, and its parent material consists of residuum from igneous and metamorphic rocks derived from the Piedmont Uplands. A typical profile consists of five soil horizons: an Ap horizon consisting of 0 to 8 inches of sandy loam, a Bt1 horizon consisting of 8 to 26 inches of clay, a Bt2 horizon consisting of 26 to 42 inches of clay, a BC horizon consisting of 42 to 50 inches of clay loam, and a C horizon consisting of 50 to 80 inches of loam saprolite. For more information on soil types within the project area, refer to Table 1.

LITERATURE AND DOCUMENT REVIEW

Before conducting the fieldwork, TerraX performed a literature and document search in order to gather pertinent background information regarding the subject property and its surroundings. This research included inspections of the Alabama State Archaeological Site File (ASASF) (Alabama Cultural Online Resource Database [ACORD] 2024), the Alabama Register of Landmarks and Heritage (ARLH) (Alabama Historical Commission [AHC] 2024), the NRHP (National Park Service [NPS] 2024), and various historic maps and aerial images (USGS 2024a and 2024b; Nationwide Environmental Title Research [NETR] 2024).

Alabama State Archaeological Site File: Research of the ASASF (ACORD 2024) identified three previous cultural resource surveys within a 1 mi radius of the proposed project area (4053130, 4072635, and 4071724). (Figure 12; Table 2). Of the three previously recorded surveys, only one intersects the indirect APE and is discussed below.

Survey 4072635. *An Archeological Survey and Evaluation of a Proposed Expansion of the Chambers County Inert Landfill, Lafayette, Alabama* (Cottier and Harmon 1993). This cultural resource survey was conducted on behalf of Engineering Service Associates, Inc. in February of 1993 outside LaFayette, Alabama. As a result of this pedestrian survey, no standing structures nor the presence of any significant precontact or historic artifacts were located within the project area. Results of this investigation were determined to be negative for any significant cultural resources within the project area.



Figure 3. View of vegetation within the project area, facing north.



Figure 4. View of vegetation and two-track road within the project area, facing south.



Figure 5. View of wetland environment within the project area, facing north.



Figure 6. View of vegetation and cleared corridor within the project area, facing north.



Figure 7. View of land clearing and two-track road within the project area, facing northeast.



Figure 8. View of land clearing and two-track road within the project area, facing southeast.



Figure 9. Topographic map showing the soil types within the western section of the project area.

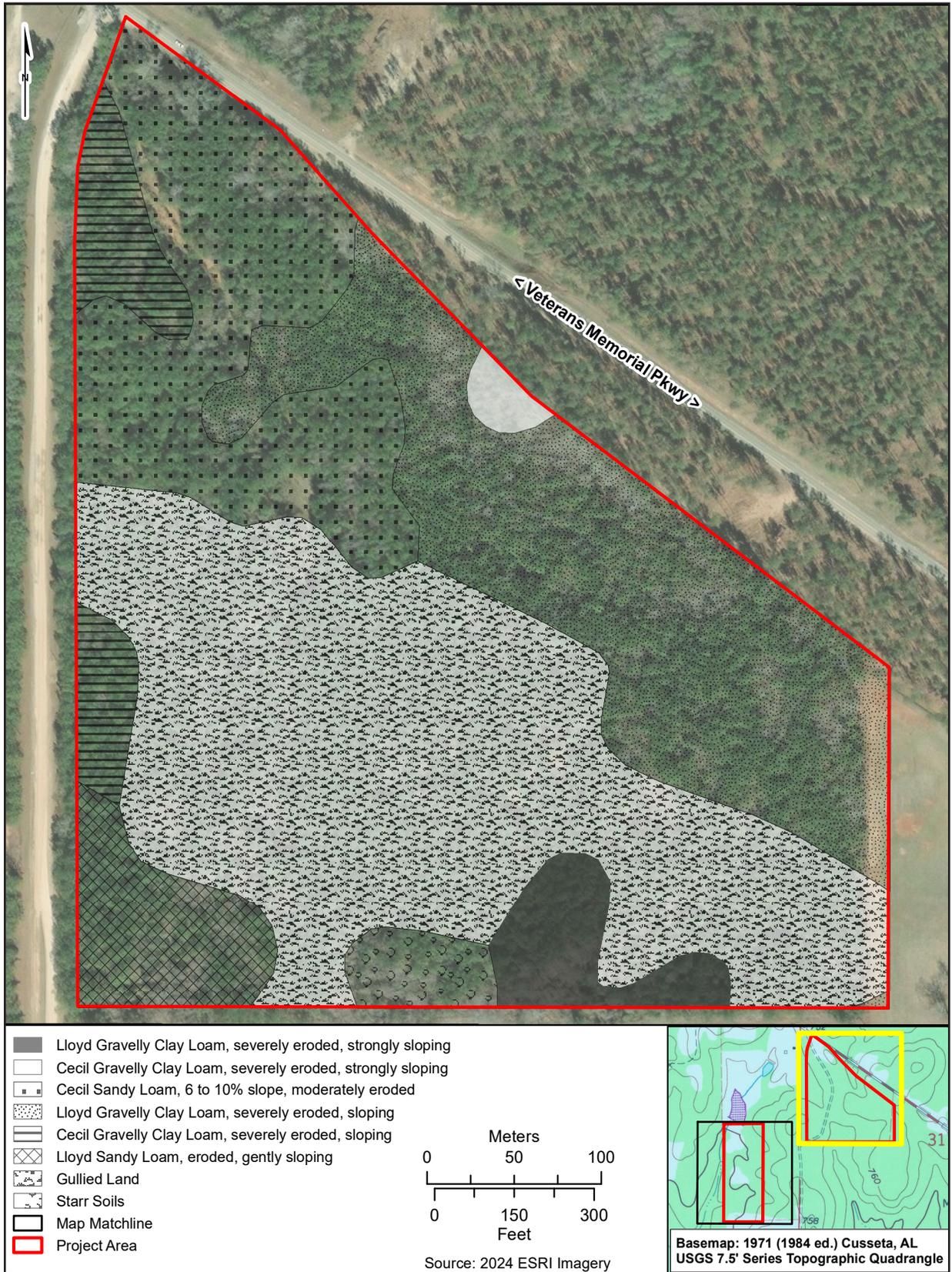


Figure 10. Topographic map showing the soil types within the eastern section of the project area.

| Table 1. Soil Types Within the Project Area. | | | |
|--|---|-----------------------|-------------------------|
| Map Unit Symbol | Map Unit Name | Acres in Project Area | Percent of Project Area |
| AbC3 | Appling gravelly sandy clay loam, severely eroded, sloping | 6.7 | 9.6% |
| AcC | Appling gravelly sandy loam, strongly sloping | 3.8 | 5.5% |
| AcD | Appling gravelly sandy loam, strongly sloping | 0.6 | 0.9% |
| AdC | Appling sandy loam, 6 to 10 percent slopes | 1.7 | 2.4% |
| CaC3 | Cecil gravelly clay loam, severely eroded, sloping | 2.9 | 4.1% |
| CaD3 | Cecil gravelly clay loam, severely eroded, strongly sloping | 0.3 | 0.5% |
| CcC2 | Cecil sandy loam, 6 to 10 percent slopes, moderately eroded | 7.8 | 11.2% |
| Ga | Gullied Land | 18 | 26% |
| LbC3 | Lloyd gravelly clay loam, severely eroded, sloping | 12.4 | 17.9% |
| LbD3 | Lloyd gravelly clay loam, severely eroded, strongly sloping | 5.7 | 8.2% |
| LeB2 | Lloyd sandy loam, eroded, gently sloping | 2.2 | 3.2% |
| Sa | Sandy alluvial land, poorly to somewhat poorly drained | 6.5 | 9.3% |
| Sd | Starr soils | 0.8 | 1.2% |
| Totals | | 69.4 | 100% |

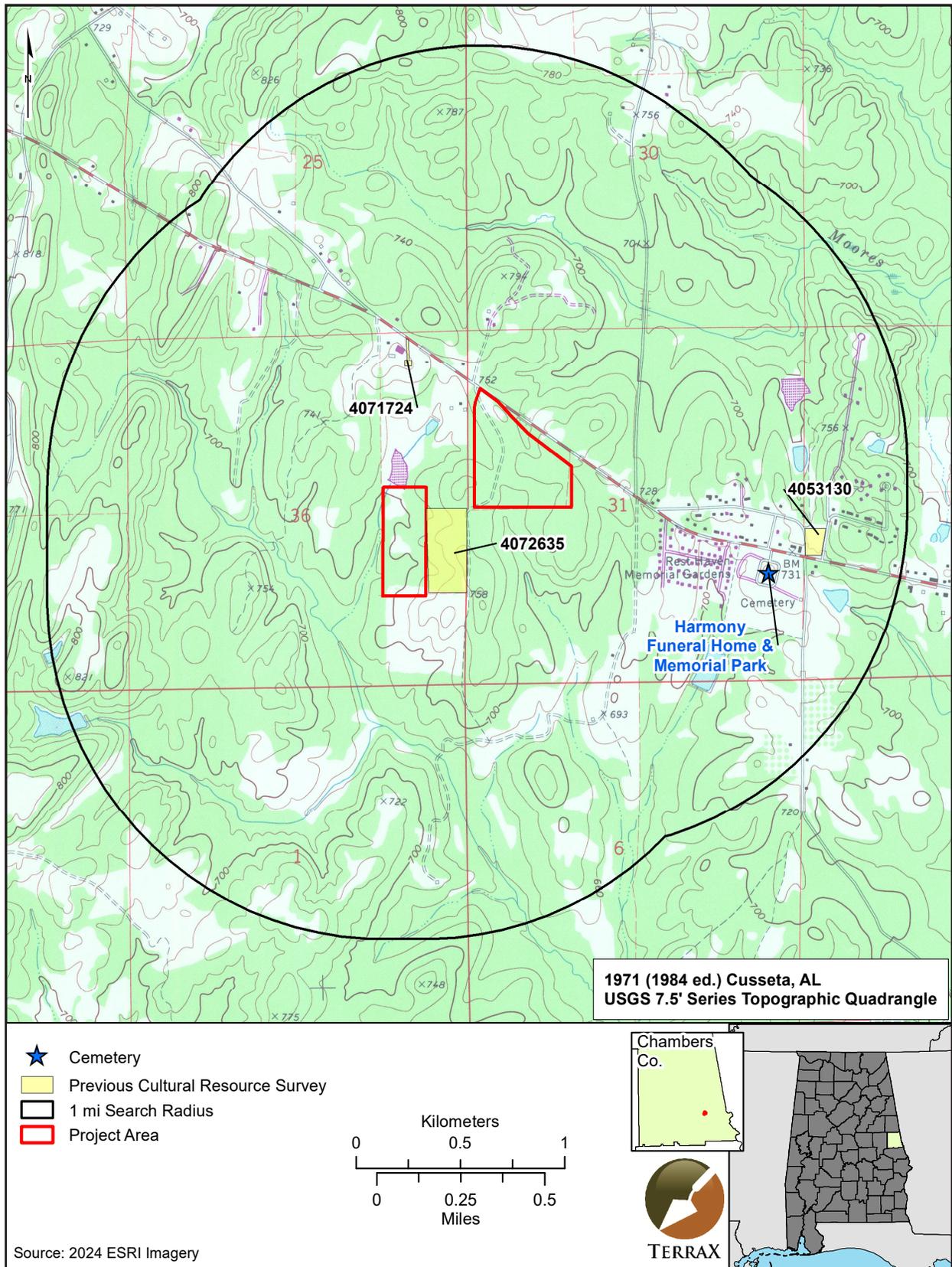


Figure 12. Topographic map showing the project area, previous cultural resources surveys, and cemetery within the 1 mi search radius.

| Table 2. Previous Cultural Resource Surveys Conducted Within a 1 mi Radius of the Project Area. | | | |
|---|------------------------------|--|-------------------------|
| ASASF Report Number | Intersects with Project Area | Report Title | Reference |
| 4053130 | No | <i>A Cultural Resource Survey and Evaluation of a Soil Borrow Area for State Highway 50.</i> | Cottier 1981 |
| 4071724 | No | <i>Proposed 300-Foot Overall Height Guyed-Type Telecommunications Structure TowerCom - West Lanett.</i> | Burnham and Bazzil 2009 |
| 4072635 | Yes | <i>An Archaeological Survey and Evaluation of a Proposed Expansion of the Chambers Inert Landfill, Lafayette, Alabama.</i> | Cottier and Harmon 1993 |

Alabama Register of Landmarks and Heritage: Examinations of the ARLH (AHC 2023) identified no previously recorded historic resources within the 1 mi search radius of the proposed project area (see Figure 12).

National Register of Historic Places: Inspections of the NRHP (NPS 2023) identified no previously listed historic property within the 1 mi search radius (see Figure 12).

One cemetery, the Harmony Funeral Home & Memorial Park, was located within the 1-mi search radius (see Figure 10). According to Find a Grave, the cemetery holds at least 3,635 graves and the oldest recorded grave dates back to 1925. The cemetery is still in use, as the most recent graves were added in 2024. The cemetery is located approximately 975 m to the east-southeast of the PA and will not be impacted by the proposed project.

Historic Map Research: A review of historic maps and aerial photographs was conducted for evidence of previous historic structures or other historic features located within the proposed project area. Maps inspected include the 1907 (1963 ed.) and 1909 (1932, 1943, 1949 eds.) Opelika, Alabama USGS 1:125000 series topographic quadrangles, the 1955 (1964, and 1974 eds.), 1957, and 1958 Phenix City, Alabama USGS 1:250000 series topographic quadrangles, the 1971 (1973 and 1977 eds.) Cusseta, Alabama USGS 1:24000 series topographic quadrangle, and the 1981 (1982ed.) Opelika, Alabama USGS 7.5' series topographic quadrangles (Figures 13-14) (NETR 2024).

A review of the earliest topographic maps, the (1963 ed.) and 1909 (1932, 1943, 1949 eds.) Opelika, Alabama topographic maps, shows a main roadway running east to west within the northern portion of the PA's eastern section. A primary structure is also located just outside the east boundary of the PA's eastern section. An unimproved road runs through the center of the western section, from north to east on these early topographic maps. The Phenix City topographic maps show that Highway 50 has been constructed to the north of the PA. The unimproved road and structures mentioned above are not present on the Phenix City topographic map. The 1971 (1973 and 1977 eds.) and 1984 (NETR 2024) Cusseta, Alabama USGS 1:24000 series topographic quadrangles show no structures within the project area but depict an unmarked road passing through the western portion of the eastern PA running north to south (see Figures 13-14). The 1984 topographic map shows what appears to be a pond north of the western PA.

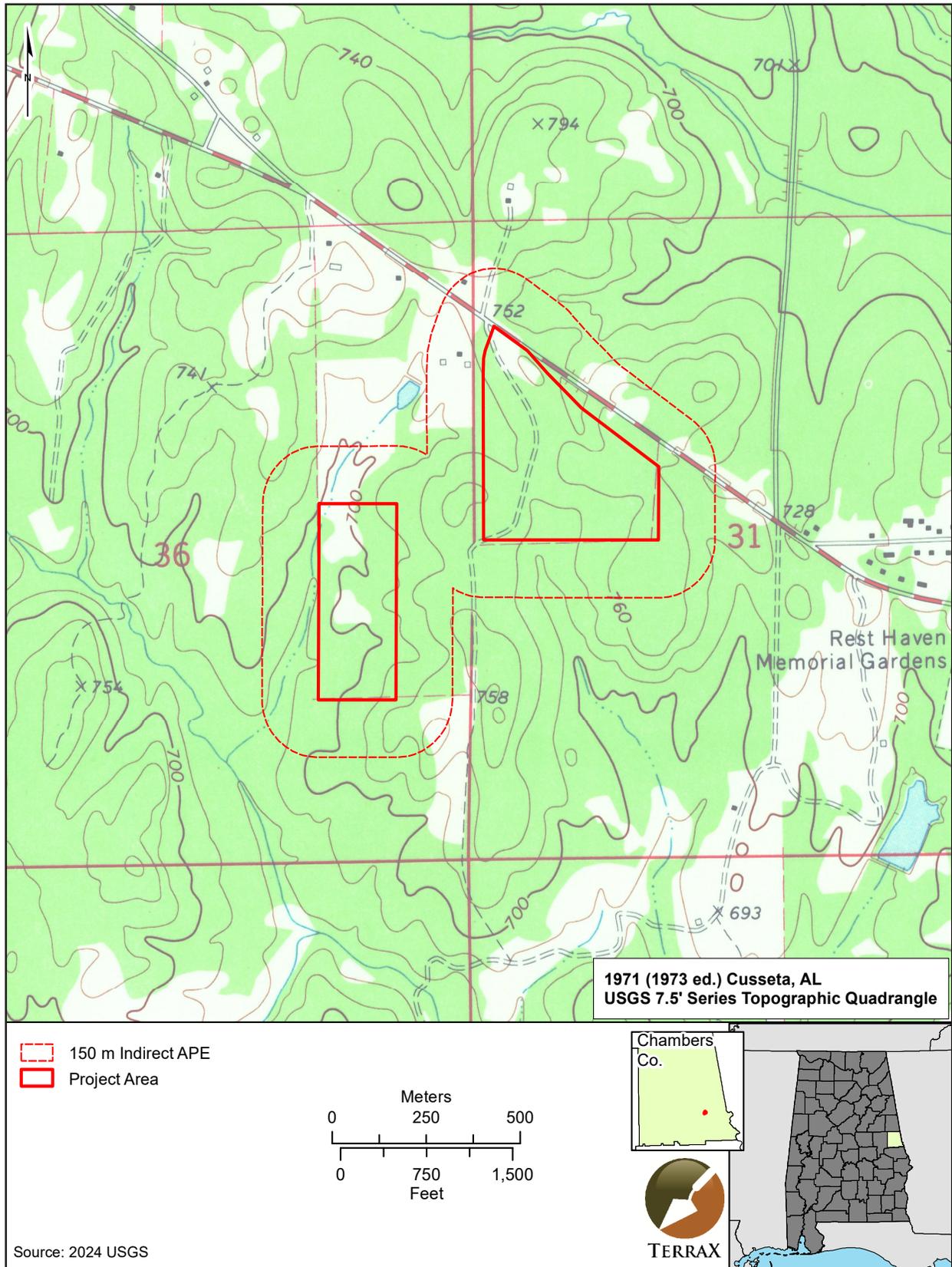


Figure 13. Historic 1971 (1973 ed.) Cusseta, Alabama USGS 7.5' series topographic quadrangle depicting the project area.

A review was conducted of aerial photographs spanning from 1958 to 2021 for evidence of previous aboveground structures or other cultural features located within the project area (NETR 2024). The 1958 aerial image shows unnamed roads that are located within the eastern project area. The PAs during this time are covered with light to moderately dense forested vegetation. The aerial image from 1969 shows that the eastern section of the project area has become densely forested with no signs of structures or cultural features. The western portion appears relatively unchanged. In the 1981 aerial image, the land south of the western section of the PA has been cleared of its woods. Vegetation growth within the western PA has become more dense, and an unnamed pond can now be seen north of the western section. By 1997, the area between the two sections has been cleared of vegetation along with areas to the south of the PA. Ongoing clearing and grading can be witnessed throughout the subsequent aerials around the PA sections. By 2011, two areas of clearing and ground disturbance can be seen in the eastern edge of the western PA. By 2021, much of the eastern edge of the PA's western section has been disturbed by clearing, grading, and standing water, though the PA's eastern section remains relatively unaltered.

FIELD METHODS

The Phase I survey was guided by procedural standards created by the Alabama Council of Professional Archaeologists in concurrence with the Alabama Historical Commission's (2006) specifications as outlined in the Policy for Archaeological Surveying and Testing in Alabama. Full land coverage requirements were achieved through visual inspections and systematic subsurface testing of the entire survey area. While conducting visual inspections, any exposed surfaces were carefully examined for cultural material.

Subsurface testing was performed within the project area along transects comprised of shovel tests spaced 30 m apart. Standard shovel tests consisted of 30 cm diameter cylindrical holes that were excavated to a depth of at least 30 to 50 centimeters below surface (cmbs) or until an impenetrable substrate (i.e., bedrock or clay), known culturally sterile subsoil, or until the water table was reached. Soils from each test were screened through 0.25-inch (0.64 cm) hardware cloth for the purpose of recovering any cultural material that may exist at that location. Shovel tests falling in areas containing an impenetrable surface (e.g., pavement or gravel) were offset up to 5 m and dug, if possible. If an obstruction was still encountered after offsetting the test location, the shovel test result was considered a "No Dig." If cultural material had been encountered, the material would have been sorted by provenience and placed into bags labeled with the pertinent excavation information before being transported to TerraX's laboratory. Any archaeological locus identified within the project area during transecting would have been further examined in order to better define its horizontal and vertical limits. Delineations would have been conducted by establishing a datum within the area of the initial find. From the datum, close-interval shovel testing (5 to 10 m intervals) would have been conducted in a cruciform pattern in cardinal directions until at least two consecutive negative tests were encountered in each direction or until shovel tests extended beyond the boundaries of the project limits. A hand-held Garmin GPS unit would have been used to record the location, and a sketch map would have been drawn by compass and pace and plotted to scale. Digital photographs would have been taken for any recorded archaeological locus as well as for the survey area.

LABORATORY METHODS AND COLLECTION CURATION

If cultural materials had been recovered during the survey, they would have been delivered to TerraX's laboratory in Tuscaloosa, Alabama for processing. Here, materials would have been sorted by provenience, cleaned, and analyzed. Along with the cultural material, all project records, photographs, and maps produced while conducting the investigation will be transported for curation at the Archaeological Research Center, Troy University, Troy, Alabama. A copy of the curation agreement can be found in Appendix A.

ARCHITECTURAL METHODS

The proposed project will expand an existing county landfill in Chambers County, Alabama near the city of Lanett. Due to the nature of the project, an indirect APE of a 150-m buffer was determined appropriate to review. Prior to commencing fieldwork, the National Register of Historic Places (NRHP) and Alabama Register of Landmarks and Heritage (ARLH) databases, and various available historic maps and aerial photographs were reviewed to identify any resources aged 50 years and older within the indirect APE (National Park Service [NPS] 2024; AHC 2024; Nationwide Environmental Title Research [NETR] 2024; United States Geological Survey [USGS] 2024a, 2024b; University of Alabama [UA] 2024). This search did not yield any previously recorded architectural resources within the ARLH or the NRHP databases (NPS 2024; AHC 2024). The available aerials dated to 1942, 1950, 1951, 1958, 1965, 1969, 1970, 1971, 1973, 1981, 1985, 1997, 2006, 2009, 2011, 2013, 2015, 2017, 2019, and 2021 (USGS 2024a; NETR 2024; UA 2024). The available topographic maps dated to 1909, 1932, 1943, 1949, 1957, 1958, 1963, 1964, 1973, 1974, 1977, 1982, 1984, 2011, 2014, 2018, and 2020 (USGS 2024b).

NRHP EVALUATION OF CULTURAL RESOURCES

According to the Alabama Guidelines, an archaeological site must be at least 50 years old and is characterized by either of the following criteria:

- A surface locus containing at least five artifacts and/or an intact feature within an area no greater than 30-x-30 m or
- A subsurface locus with a minimum of five artifacts from one or more shovel tests where the positive shovel tests are no more than 30 m apart.

In contrast to archaeological sites, isolated finds are defined as no more than four artifacts found within a 30 m radius and are not assigned a state trinomial.

Outlined within 36 CFR 60.4 are four criteria by which cultural resources should be evaluated to determine their eligibility for the NRHP. Properties may be eligible for NRHP when the quality of significance in American history, architecture, archaeology, and/or culture is present in districts, sites, buildings, structures, and objects that meet at least one of the four criteria listed below. These properties are either:

- a) associated with events that have made a significant contribution to the broad pattern of our history,
- b) associated with the lives of persons significant in our past,
- c) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction,
- d) have yielded or may be likely to yield, information important in prehistory or history.

Criteria A, B, and C are most commonly applied to buildings, structures, districts, or non-archaeological sites. Although cultural resources or properties nominated under these criteria may have archaeological deposits, individual archaeological sites are most frequently evaluated and considered eligible specifically under Criterion D, though they must be evaluated under all Criteria. Importantly, properties eligible under Criterion D are only required to contain the potential to yield important information in history or prehistory. Because theoretical orientations shift, new techniques become available, and new information is discovered over time, there are no objective criteria that define what may be considered “important information.” However,

cultural resource management practitioners generally agree that important information should be defined by the site's ability to contribute to local, state (i.e., regional), or national research themes, with local and state research themes being the most common analytical frame of reference (Little et al. 2000).

Additionally, NRHP-eligible properties must possess integrity, defined as “the ability of a property to convey its significance” (NPS 1995). Evaluations of integrity must always be made with respect to the physical features of a property and how they relate to the property's significance (Little et al. 2000:35). Formally outlined, the categories of integrity include:

- Location—The place where the historic property was constructed or the place where the historic event occurred.
- Design—The combination of elements that create the form, plan, space, structure, and style of property.
- Setting—The physical environment of a historic property. Setting includes elements such as topographic features, open space, viewshed, landscape, vegetation, and artificial features.
- Materials—The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- Workmanship—The physical evidence of the labor and skill of a particular culture or people during any given period in history or prehistory.
- Feeling—A property's expression of the aesthetic or historic sense of a particular period of time.
- Association—The direct link between an important historic event or person and a historic property.

Under Criterion D, integrity is measured by the strength of association between data and important research questions (NPS 1995; Little et al. 2000:36).

While not all of these qualities are required for eligibility, “to retain historic integrity a property will always possess several, and usually most, of the aspects” listed above (NPS 1995). Little et al. (2000:35) note that the importance of the seven aspects of integrity will vary according to the nature of the property and under which Criterion or Criteria the property is being considered. Under Criterion D, for example, the aspects of location, design, materials, and association are perhaps most relevant (Little et al. 2000:36; NPS 1995). Integrity is frequently used by archaeologists to refer to “the level of preservation or quality of information contained within a district, site, or excavated assemblage. A property with good archaeological integrity has archaeological deposits that are relatively intact and complete” (Little et al. 2000:36). Though careful to acknowledge that relevant aspects of integrity are directly related to a site's ability to contribute to research themes and will vary accordingly, Little et al. (2000:37) provide examples of general qualities of sites that demonstrate integrity such as surface or subsurface spatial patterning of artifacts or features and the absence of serious disturbance to the archaeological deposits. These attributes do not constitute a comprehensive representation of integrity but are referred to here for illustrative purposes. Importantly, site integrity alone does not constitute eligibility, nor can it be used as a screen for significance; assessments of integrity must follow assessments of significance (Little et al. 2000; NPS 1995).

ARCHAEOLOGICAL SURVEY RESULTS

This Phase I investigation included the placement of 304 shovel tests along 22 transects though the total PA of 69.4 ac (28.1 ha) (Figures 15 and 16). Of the 304 shovel tests, 276 shovel tests were negative (sterile, containing no cultural material), and 28 shovel tests could not be excavated due to wetlands and a retention pond found within the PA. Shovel testing within the project area typically exposed 5 cmbs of dark brown loam (7.5YR 3/3) overlying a red brown silty clay (5YR 4/4) to a maximum depth of 30 cmbs (Figure 17).

Historic and modern maps and aerial photographs were inspected in order to document the presence or absence of built features in the project area through time (NETR 2024, USGS 204a and 2024b). Aerial images spanning from 1942 to 2021 or any editions of the local USGS topographic maps show that the project areas remained largely unchanged as dense tree growth with no development during this time. No structures are extant (see Figures 13-14). Early use of the landfill in an area south-adjacent of the western tract is evident on aerial photographs as early as 1958.

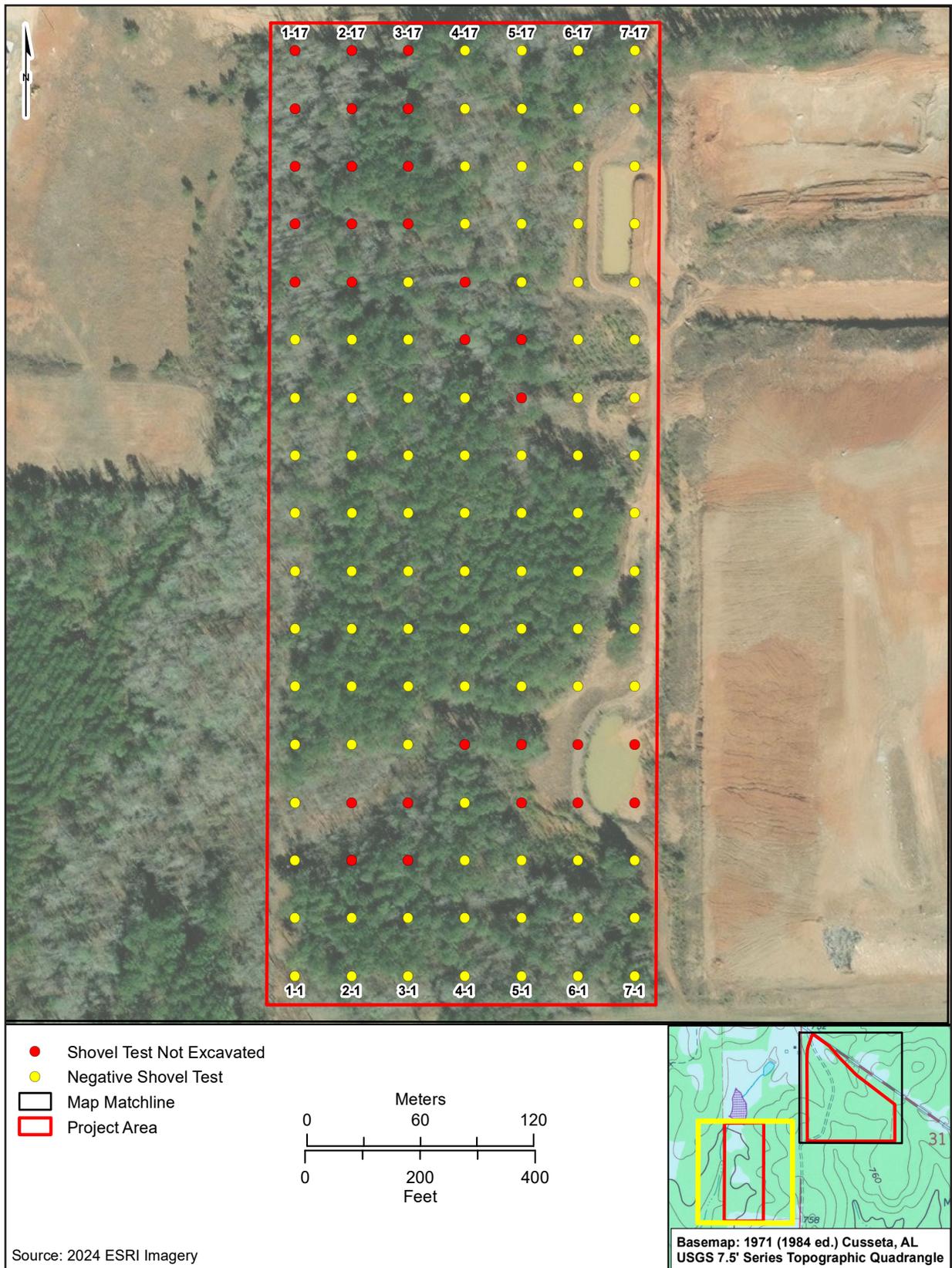
The investigation did not recover any archaeological material or discovery of any archaeological sites. As such, TerraX recommends that the future undertaking be allowed to proceed regarding cultural resource concerns.

ARCHITECTURAL SURVEY RESULTS

In compliance with Section 106 of the National Historic Preservation Act of 1966 (36 CFR Part 800), TerraX conducted a historic resource survey to identify resources that are listed or may be eligible for inclusion in the NRHP within and around the proposed project area in Chambers County, Alabama.

The proposed project area consists of two noncontiguous areas to the south of Veterans Memorial Parkway (AL-50) totaling approximately 69.4 ac. The proposed project area is located approximately 4.9 mi west of the city of Lanett, Alabama. The area around the proposed project area mainly consists of densely wooded land, agricultural land, industrial, and residential buildings.

A review of the maps and aerial photographs did not find any extant architectural resources constructed within the indirect APE. Throughout the aerials, the project area is covered with dense tree growth, and there is no evidence of a building located within the indirect APE before the 1985 aerial photograph. From 2006 to 2011, some development occurred surrounding the project area, including a reduction in tree coverage and the construction of industrial buildings to the east and west, though the project area has remained largely unchanged since the 1985 aerial photograph (NETR 2024). No further architectural survey is recommended.



Source: 2024 ESRI Imagery

Figure 13. Aerial image showing shovel test placements and results within the western section of the project area.



Figure 14. Aerial image showing shovel test placements and results within the eastern section of the project area.



Figure 15. Photo of a typical shovel test within the PA.

CONCLUSIONS AND RECOMMENDATIONS

TerraX was contracted by Chambers County Landfill, LLC to conduct a cultural resources survey for the proposed Industrial Waste Landfill in Chambers County, Alabama. The Phase I survey was performed between March 18 and March 22, 2024. Emma Jackson Pepperman served as the Principal Investigator and was assisted in the field by Cheyenne Davis and Jordan Jones. As there is currently no federal involvement in this project, Chambers County Landfill, LLC requested an archeological survey in order to meet cultural resources due diligence standards.

The project area, located in a rural area southeast of the city of LaFayette, Alabama, consists of two noncontiguous tracts that totaled an approximate 69.4 ac (28.1 ha). The archaeological survey of this PA did not recover any archaeological material or discovery of any archaeological sites. The architectural survey did not result in the identification of any resources within the Chambers County Landfill indirect APE. As such, TerraX recommends that the future undertaking be allowed to proceed regarding cultural resource concerns.

There is always the possibility of undetected cultural resources such as graves or other cultural features not discovered through standard survey methods. There are significant historic and archaeological sites in Alabama located under pavement, railroad beds, and buildings. All work should be halted in the unlikely event that burials or cultural features are revealed during the proposed project. If the human remains are located, the county coroner or sheriff should be contacted immediately. The coroner or local law enforcement will determine if the remains are forensic or archaeological. The Alabama Historical Commission should be alerted of any discovery.

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APPENDIX A
CURATION LETTER

Archaeological
Research
Center
327 MSCX
Troy, Alabama
36082
334-808-6771

January 1, 2024

Paul Jackson
TerraXplorations
3523 18th Avenue, NE
Tuscaloosa, AL 35406

RE: Letter of Acceptance of Archaeological Collections



This memo serves as our [Troy University Archaeological Research Center] acceptance and long-term curation of archaeological collections from TerraXplorations.

We appreciate this opportunity to be of assistance and look forward to working with you in the future.

Sincerely,

Stephen Carmody

Stephen Carmody
Troy University Archaeological Research Center
120 MSCX
Troy, Alabama 36082
Lab Phone: (334) 808-6771
Office Phone: (334) 808-6850

If you are in agreement to the above terms, please complete the bottom and return:

Signature *Mark Donop*

Printed Name: Mark Donop

Address to be invoiced:

TerraXplorations Lab
3120 University Boulevard E
Tuscaloosa, Alabama 35404



APPENDIX B
CURRICULUM VITAE OF PRINCIPAL INVESTIGATOR



PRINCIPAL INVESTIGATOR

205.657.0391 • ejpepperman@terraxplorations.com

Emma Jackson Pepperman, M.A., has over eleven years of experience in the CRM field, most of which were served in the TerraX laboratory. Her interests as a historian lie in labor experience, New South violence, and how religion in the South is involved in both. She has experience processing, analyzing, and curating prehistoric and historic artifacts from every state in the Southeast, organizing data, creating displays, developing websites, writing proposals and reports, managing the office, and performing Phase I fieldwork. She is currently managing projects as a Principal Investigator, writing histories, and creating exhibits and displays for interested clients. Ms. Pepperman's responsibilities for TerraX include managing personnel, writing technical reports and journal articles, writing proposals and budgets, and building physical and online exhibits. Ms. Pepperman has an M.A. in History, a Museum's Certificate, and a Minor B.A. in Art from The University of Alabama.

YEARS OF EXPERIENCE/YEARS WITH FIRM

5/11

EDUCATION

- M.A. in History with a Museum Certificate, University of Alabama
- B.A. in History with a minor in Art, University of Alabama (magna cum laude)

CERTIFICATIONS

- International Association of Professions Career College Genealogist Certification
- Museum Studies Certification

AREAS OF EXPERTISE

- Laborer's Experience
- New South Violence
- Southern Religion
- Exhibit display production
- Website development
- Genealogy
- Public education
- Podcast script writing
- In-person and digital archival research

SELECTED EXPERIENCE

TERRAXPLORATIONS, INC.

Principal Investigator/Historian

August 2021 to Present

Historian/Technical Writer

June 2021 to August 2021

UNIVERSITY OF ALABAMA GRADUATE SCHOOL

Graduate Student

August 2019 to May 2021

TERRAXPLORATIONS, INC.

Laboratory Director

2014 to 2019

Archaeological Field Technician

Summer 2016 and 2018

Laboratory Technician

2012 to 2014

SELECTED PUBLICATIONS

2023

Phase I Cultural Resources Survey for ALDOT BR-0001(625) Bridge Replacement on SR-1 over Cheneyhatchee Creek (Bin 005230) & (Bin 008231) Barbour County, Alabama.

Authored by Emma Jackson Pepperman and David Dobbs. Prepared by TerraXplorations, Inc., Tuscaloosa, Alabama. Prepared for AECOM, Birmingham, Alabama.

A Phase I Cultural Resources Survey of Seven Acres of Land on East Railroad Street in Gulfport, Harrison County, Mississippi.

Authored by Emma Jackson Pepperman, Margaret Schultz, Sam Johnson, and Alexis Muschal. Prepared by TerraXplorations, Inc., Tuscaloosa, Alabama. Prepared for Covington Civil and Environmental, Gulfport, Mississippi.



SELECTED PUBLICATIONS (CONTINUED)

A Phase I Archaeological Survey for the I-285 Eastside Express Lanes, DeKalb County, Georgia, PI No. 0013914.

Authored by Emma Jackson Pepperman, Elizabeth Southard, Margaret Schultz, Terry Barbour, Sharlene O'Donnell, Heather Draskovich, and Paul D. Jackson. Prepared by TerraXplorations, Inc., Tuscaloosa, Alabama. Prepared for Atkins North America, Atlanta, Georgia and the Georgia Department of Transportation, Atlanta, Georgia.

2022

A Phase I Cultural Resources Survey for the Kewanee Site Development Project in Lauderdale County, Mississippi.

Authored by Emma Jackson Pepperman and Paul D. Jackson. Prepared by TerraXplorations, Inc., Tuscaloosa, Alabama. Prepared for Engineering Plus, Inc., Meridian, Mississippi.

A Phase I Cultural Resources Survey for the Proposed NSU North Business Park in Natchitoches Parish, Louisiana.

Authored by Emma Jackson Pepperman and Paul D. Jackson. Prepared by TerraXplorations, Inc., Tuscaloosa, Alabama. Prepared for Cothren, Graff, Smoak Engineering, Inc., Shreveport, Louisiana.

A Phase I Cultural Resources Survey of the Dahlonega-Dawson Crossing 115kv Transmission Line Project, Lumpkin County, Georgia.

Authored by Emma Jackson Pepperman, Kenny Pearce, Margaret Shultz, and Briane Shane. Prepared by TerraXplorations, Inc., Tuscaloosa, Alabama. Prepared for Georgia Power Company, Atlanta, Georgia.

Brookhaven 10-Year History Project.

Authored by Emma Jackson Pepperman, Margaret Schultz, and Katie-Bryn Hubbard. Prepared by TerraXplorations, Inc., Tuscaloosa, Alabama. Prepared for the City of Brookhaven, Georgia.

2021

A Phase I Cultural Resources Survey for the West Central Alabama Highway Project, ALDOT Project No. RAED-069-000-040 Corridor Development to Design Build 4-Lanes from Fayette, AL to I-22, Marion and Fayette Counties, Alabama.

Authored by Emma Jackson Pepperman, Elizabeth Southard, and Briane Shane. Prepared by TerraXplorations, Inc., Tuscaloosa, Alabama. Prepared for AECOM, Dallas, Texas.

A Phase I Cultural Resources Survey for the Proposed Forkland, Alabama, Port Facility Project in Greene County, Alabama.

Authored by Emma Jackson Pepperman. Prepared by TerraXplorations, Inc., Tuscaloosa, Alabama. Prepared for TTL, Inc., Nashville, Tennessee.

A Phase I Cultural Resources Survey for the TGP 100-3 Line Pig Launcher in Washington County, Mississippi.

Authored by Emma Jackson Pepperman and Amy Carruth. Prepared by TerraXplorations, Inc., Baton Rouge, Louisiana. Prepared for Providence Group, LLC., Baton Rouge, Louisiana.

“George Russel v. The State: Crime and Violence in the Antebellum South.”

Authored by Emma Jackson Pepperman, Margaret Schultz, and AnnMarie Shields. Online Scalar Project.

2020

A Phase III Archaeological Mitigation of the Point Pleasant Site (16IV199) in Iberville Parish, Louisiana.

Authored by Paul D. Jackson, Sharlene O'Donnell, Kevin Rolph, Emma Jackson Pepperman, Raychel Durdin, Brad Lanning, and Natalia Moonier. Prepared by TerraXplorations, Inc., Baton Rouge, Louisiana. Prepared for Shintech Louisiana, LLC, Plaquemine, Louisiana.

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BROWNE
AND COMPANY, LLC
3312 Northside Drive • Building D, Suite 220
Macon, Georgia 31210 Ph/Fx: 478-743-4843

SMITH+GARDNER
14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

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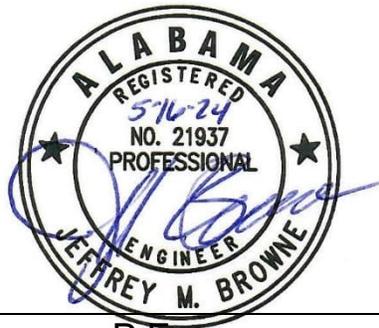
Operations Plan

Chambers County Landfill Lanett, Alabama

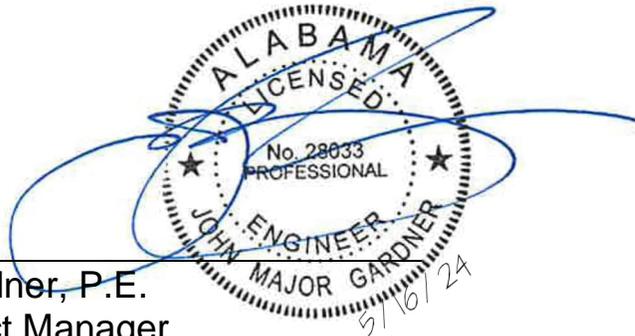
Prepared For:

Chambers County Landfill, LLC West Point, Georgia

S+G Project No. CHAMBERS-24-1



Jeffrey M. Browne, P.E.
Senior Engineer



John M. Gardner, P.E.
Senior Project Manager
john@smithgardnerinc.com

May 2024

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OPERATIONS PLAN

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| A | Unauthorized Waste Identification Plan |

This Operations Plan (Plan) was prepared for the Chambers County Landfill (Landfill) to satisfy the requirements of the Alabama Department of Environmental Management (Department), Land Division – Solid Waste Program (Division 13) Administrative Code. Included in the plan are the administrative provisions of Section 4 (Permit Requirements), Subsections 21¹, 23², and 29³ are repeated below in *italicized* font with the provisions of compliance at the Landfill immediately following in **Bold**.

General Operational Standards of Landfill Units (ADEM Admin. Code r. 335-13-4-.21)

Any person or agency operating or planning to operate a landfill unit shall operate and maintain the facility consistent with this Division. General requirements for operating and maintaining an acceptable landfill unit shall be:

(1) General Operation

(a) *The operation and use of the landfill unit shall be as stipulated in the permit.*

All operations and use of the Landfill unit complies with the current Alabama Department of Environmental Management Solid Waste Permit No. 09-02.

(b) *Waste accepted at the facility shall be strictly controlled so as to allow only waste stipulated on the permit or otherwise as may be approved by the Department. The permittee of any facility permitted under these rules must have in the operating record a plan describing procedures the permittee will implement for detecting and preventing the disposal of free liquids, regulated hazardous wastes, regulated medical wastes, and regulated PCB wastes at the facility. This plan must include at a minimum:*

Unauthorized waste is controlled as detailed in the Unauthorized Waste Identification and

¹ ADEM Admin. Code r. 355-13-4-.21: General Operational Standards for Landfill Units

² ADEM Admin. Code r. 355-13-4-.23: Specific Requirement for Inert – Construction/Demolition Landfills and Industrial Landfills

³ ADEM Admin. Code r. 355-13-4-.29: Recordkeeping Requirements

Prevention Plan (copy included in this Operations Plan as Attachment 1) a copy of which is contained in the Landfill's Operating Record.

1. *Random inspections of incoming loads to ensure that incoming loads do not contain free liquids, regulated hazardous wastes, regulated medical wastes, or regulated PCB wastes.*
2. *Inspection of suspicious loads.*
3. *Records of all inspections to include the origin of waste suspected to be regulated hazardous, regulated medical, or regulated PCB waste, if known; transporters, to include transfer stations and all handlers of the waste en route to the disposal site; and any certifications from generators provided to the permittee or facility personnel. These records must be maintained on file in the operating record of the facility.*
4. *Training of facility personnel to recognize free liquids, regulated hazardous wastes, regulated medical wastes, and regulated PCB wastes.*
5. *Procedures for notifying the proper authorities if free liquids, regulated hazardous wastes, regulated medical wastes, or regulated PCB wastes are discovered at the facility.*
6. *Methods to identify all industrial users of the facility, producers of special wastes, and transporters of these wastes.*

The requirements above are included in the Unauthorized Waste Identification and Prevention Plan which is included as Attachment 1 to this Plan.

- (c) *Prior to disposal of industrial waste and/or medical waste, the permittee shall obtain from each generator a written certification that the material to be disposed does not contain free liquids, regulated hazardous wastes, regulated medical wastes, or regulated PCB wastes.*

Written certification of any industrial and/or medical waste stream will be obtained prior to disposal and will include statements that the waste does not contain free liquids, regulated hazardous wastes, regulated medical wastes, or regulated PCB wastes.

1. *This certification may be based on laboratory analysis of the waste on a case-by-case basis, or documentation supporting the generator's knowledge of the wastestream(s), or as may be required by the Department.*

Certification of industrial and/or medical waste streams will be based on one of the above methods.

2. *Copies of the certification shall be submitted to the Department for disposal approval and for any specific requirements prior to disposal. After submittal of the required certification, the Department shall have five (5) working days to respond. If no response is given, the permittee may dispose of the material as proposed.*

Copies of waste stream certifications will be submitted to the Department prior to disposal.

3. *In the case of one-time emergency disposal requests, the permittee shall submit the required certification no later than five (5) days after the disposal of waste.*

One-time emergency disposal requests will be submitted to the Department no later than five (5) days following disposal of the waste.

4. *Certification shall be renewed or revised biennially (every two years) or at such time that operational changes at the point of generation could render the waste hazardous, whichever is more frequent and submitted to the Department for approval.*

Waste stream certifications will be renewed and submitted to the Department within the above timeframes for each waste stream that requires such certification.

5. *Copies of these certifications and approvals shall be maintained on file in the operating record of the facility and shall be made available for the Department upon request.*

Waste stream certifications and approvals will be maintained within the Landfill's operating record and will be made available to the Department upon request.

6. *The above requirements notwithstanding and, as may otherwise be required, pursuant to Division 13 rules, generators will not be required to submit certification to the Department provided that:*

- (i) *The waste will be disposed of at a non-commercial industrial waste landfill which has been permitted by the Department, and is owned either exclusively or mutually by the generator(s) of the waste, and which disposes of waste generated only by the owner(s);*
- (ii) *The wastestream(s) to be disposed of are specifically described in the Solid Waste Landfill Permit issued by the Department or in the final application as referenced by the permit for the site designated to receive the waste;*
- (iii) *The required certification, as described above, is maintained on-site by the owner(s) of the landfill; and*
- (iv) *The required certification, as described above, is made available for inspection by the Department upon request.*

The Landfill is not a generator of waste and is not a non-commercial industrial waste landfill. Waste certifications for generators will be maintained as detailed in 335-13-4-.2(1)(c).

- (d) *The landfill unit shall be operated in such a manner that there will be no water pollution or unauthorized discharge.*

1. *Any discharge resulting from a landfill unit or practice may require:*

- (i) *A National Pollutant Discharge Elimination System (NPDES) permit under the Alabama Water Pollution Control Act as issued by the Department.*

- (ii) *A dredge or fill permit from the Army Corps of Engineers as required under Section 404 of the Clean Water Act, as amended; or*
- (iii) *That a non-point source of surface waters does not violate an area wide or statewide water quality management plan that has been approved under the Alabama Water Pollution Control Act.*

The Landfill will be operated and maintained such that no water pollution or unauthorized discharges will be released from the Landfill and supporting appurtenances (sediment ponds). In the event that discharges of storm water are anticipated, the required permits will be obtained, as necessary, prior to any such releases or discharges.

- 2. *The groundwater shall not be contaminated as specified by this Division.*

In accordance with the Landfill's solid waste permit, the facility is not required to include a groundwater monitoring well network.

- (e) *The historic and certified disposal areas shall be identified with a sufficient number of permanent markers which are at least visible from one marker to the next.*

All limits of waste will be clearly identified with permanent edge of waste markers placed at regular intervals around the site which are at least visible from one marker to the next.

- (f) *Measuring or weighing devices shall be required for all municipal solid waste landfill units accepting solid waste. All solid waste shall be properly measured or weighed prior to disposal unless otherwise approved by the Department.*

The Landfill uses weigh scales to quantify waste prior to disposal. Records of waste acceptance quantities will be maintained by the Landfill in the operating record.

- (g) *Deep rooted vegetation (with roots that may grow below the six inch erosion layer) shall be prohibited as vegetative cover.*

No deep-rooted vegetation will be utilized for vegetation on the Landfill.

- (h) *With the exception of very small quantity generator waste disposed of in municipal solid waste landfills, regulated hazardous waste, as defined by Division 14 of the ADEM Administrative Code, is prohibited from disposal in a non-hazardous landfill unit.*

No regulated hazardous wastes will be disposed of in the Landfill.

(2) Open Burning

- (a) *Open burning of solid waste at any landfill unit is prohibited unless approved by the Department as follows:*

- 1. *Clearing debris at the landfill unit such as trees and stumps may be burned if prior approval is received from the Department and the Alabama Forestry Commission.*

Approval for open-burning of land-clearing debris will be obtained prior to any open burning activities.

2. *Emergency clean-up debris resulting from catastrophic incidents may be burned at a permitted landfill unit if consistent with the intent of this Division and air pollution control requirements. Prior approval must be received from this Department and other appropriate agencies.*

In the case of emergency debris management, including but not limited to floods, hurricanes, and tornado debris, prior approval from the Department and other appropriate agencies will be obtained prior to open-burning.

3. *If approved, the burning shall not occur over previously filled areas or within 200 feet of existing disposal operations unless otherwise specified by the Department and such burning shall not cause a public nuisance or pose a threat to public health.*

No open-burning will occur over previously filled areas or within 200 feet of existing disposal operations unless otherwise approved by the Department. Approved open-burning will not cause a public nuisance or pose a threat to public health.

- (b) *The person or agency requesting permission to burn solid waste shall apply in writing to the Department, outlining why a burn request should be granted. This request should include, but not be limited to, specifically what areas will be utilized, types of waste to be burned, the projected starting and completion dates for the project, and the projected days and hours of operation.*

In the event that open-burning of solid waste is anticipated, written requests will be submitted to the Department prior to such activities. Written requests will include, at a minimum, specifically what areas of the site will be utilized, the types of solid waste to be burned, the projected start/completion dates for the work, and the projected days and hours of operation.

Specific Requirements for Inert-Construction/Demolition Landfills and Industrial Landfills
(ADEM Admin. Code r. 335-13-4-.23)

The following requirements in conjunction with 335-13-4-.21 shall be for operating and maintaining an acceptable Construction/Demolition Landfill or Industrial Landfill:

(1) Operation

(a) All waste shall be covered as follows:

1. A minimum of six inches of compacted earth or other alternative cover material that is approved by the Department shall be added at the conclusion of each week's operation or as otherwise specified by the Department to control disease vectors, fires, odors, blown litter and scavenging.

Per 335-13-4-.23(1)(a)1, operational cover material consisting of at least six inches of compacted earth or other alternative cover material approved by the Department, will be applied, at a minimum, at the conclusion of each week's operation to control/prevent disease vectors, fires, odors, blown litter and scavenging.

2. In the event that erosion develops on previously covered disposal areas, or when covered waste otherwise becomes exposed, cover must be re-applied to comply with the minimum cover requirements of subparagraph (1)(a)1. of this section.

Cover material will be reapplied to repair erosion or cover any exposed waste within previously covered areas, as needed.

3. Final closure shall be carried out in accordance with 335-13-4-.20 of this Division.

Final closure will be conducted in accordance with 335-13-4-.20 and the approved closure plan. Refer to the Closure/Post-Closure Plan (May 2024) for additional details regarding closure.

- (b) All waste shall be thoroughly spread in layers two feet or less in thickness and thoroughly compacted weekly with adequate landfill equipment prior to placing additional layers of waste or placing the weekly cover as specified in 335-13-4-.23(1)(a)1, unless otherwise approved by the Department. Waste, such as construction/demolition waste and other types of waste, which cannot be managed by landfill equipment in this manner shall be managed in a manner approved by the Department.

All waste will be disposed of and compacted in layers two feet or less in thickness and thoroughly compacted weekly with adequate landfill equipment prior to placing additional layers of waste or placing the weekly cover material. Any deviations from these operating conditions will be conducted by methods approved by the Department.

- (c) All waste shall be confined to as small an area as possible within a single working face and placed onto an appropriate slope not to exceed 4 to 1 (25%) or as approved by the Department.

The area of the active, single working face will be kept as small as practical. At this Landfill, a variance is being requested such that waste placement will be conducted on slopes no

steeper than 3H:1V (33.3%). In this regard, refer to the Petition for Variance accompanying this application which addresses the requirements of Division 13 based on the procedures outlined in 335-13-8-.02 through 335-13-8-.05.

(d) *The facility shall be operated in accordance with approved plans and permits.*

The Landfill will be operated in compliance with all approved plans and permits.

(e) *The site shall be adequately secured to prevent entry except by authorized person(s) unless an operator is on site.*

Access to active areas of the landfill will be controlled by a combination of fences, gates and natural barriers, and strictly enforced operating hours. A landfill attendant will be on duty at all times when the facility is open to enforce access restrictions. The main entrance is secured by a gate which will be locked during non-operating hours.

(f) *If the site is available to the public or commercial haulers, a sign shall be posted at the landfill stating:*

1. *Name of permittee,*
2. *Owner and/or operator,*
3. *Name of landfill,*
4. *Days and hours of operation,*
5. *Waste types accepted, and*
6. *Disposal fees for use of the landfill.*

A sign stating the required information is currently installed that includes the required information.

(g) *Provisions shall be made for disposal activities in adverse weather conditions.*

Operational procedures that will be followed during adverse weather conditions include the following.

Ice Storms

An ice storm can make access to and within the facility dangerous, preventing the movement of workers and/or equipment, and, thus, may require closure of the facility until the ice is removed or has melted.

Heavy Rains

Exposed bare soil surfaces can create muddy conditions in some portions of the facility during rainy periods. The control of drainage and use of crushed stone on critical sections of unpaved roads is planned to provide all-weather access and promote drainage to the on-site storm water/sediment pond. In these areas where the aggregate surface is eroded or otherwise rendered ineffective, new aggregate will be placed.

Intense rains can affect newly constructed drainage structures such as swales, diversions, cover soils, and vegetation. After such a rain event, inspection by facility personnel will be initiated and corrective measures taken to repair any damage encountered before the next significant rainfall.

Electrical Storms

The open area of the facility is susceptible to the hazards of an electrical storm. If necessary, activities will be temporarily suspended during such an event.

Windy Conditions

Facility operations during a particularly windy period may require that the working face be temporarily shifted to a more sheltered area. When this is necessary, the previously exposed face will be immediately covered with cover soil.

Major Storms

In the event of hurricane, tornado, or severe winter storm warning issued by the National Weather Service, facility operations may be temporarily suspended until the warning is lifted. Cover soil will be placed on exposed waste and equipment will be properly secured to the extent deemed necessary.

(h) Adequate personnel shall be provided to ensure continued and smooth operation of the site.

Adequate numbers of site personnel will be maintained for smooth operations, including but not limited to, one (1) Site Manager, one (1) operations manager, one (1) scale house attendant, and as many operators and/or laborers as required based on operating conditions.

(i) Adequate equipment shall be provided to ensure continued operation in accordance with permit and regulations.

The facility will maintain on-site equipment required to perform the necessary site activities. Periodic maintenance of equipment as well as minor and major repair work will be performed as needed, based on operating conditions.

(j) Bulk or non-containerized liquid waste, or containers capable of holding liquids, shall not be accepted at a C/DLF or ILF unless:

- 1. The liquid is leachate or gas condensate derived from the C/DLF or ILF unit, and*
- 2. The C/DLF or ILF unit is designed with a minimum single liner and leachate collection system or approved equivalent liner and leachate collection system.*

The Landfill will not accept any liquids for disposal. This Landfill is not designed or permitted to incorporate liners or leachate collection systems.

(k) Empty containers larger than 10 gallons in size must be rendered unsuitable for holding liquids prior to disposal in the landfill unit unless otherwise approved by the Department.

Empty containers with volume larger than 10 gallons will be rendered unsuitable for holding liquids prior to disposal in the Landfill.

(l) Unless otherwise provided by 335-13-4-.23(1)(j), free liquids are prohibited from disposal in the landfill unit.

No free liquids will be disposed of in the Landfill.

(2) Routine Maintenance

- (a) *Scavenging shall not be permitted, and salvaging operations shall be controlled.*

No scavenging will be allowed to occur at the Landfill. Salvaging operations will be controlled.

- (b) *Litter shall be controlled within the permitted facility.*

Trees/bushes surrounding a portion (western and northern sides) of the Landfill acts as barriers to keep litter contained within the site. Additionally, as necessary, a litter control crew will pick up litter around the site and along access roads. Wind screens and/or litter fences may be installed/erected adjacent to active areas as needed to control windblown waste materials. Additionally, the facility operator will make operational changes, as practical, based on wind conditions.

- (c) *Completed sites or portions of sites shall be properly closed as provided by this Division and approved facility plans.*

Closure will be completed in accordance with the Landfill permit, requirements of the Department and approved plans.

- (d) *An all-weather access road shall be provided to the dumping face.*

All-weather access roads will be provided to access the working face.

- (e) *Environmental monitoring and treatment structures shall be protected and maintained in good repair and easily accessible.*

Environmental monitoring structures (methane monitoring probes) will be protected and maintained in good repair and will accessible. The Landfill has no treatment structures.

- (f) *The average daily volume of waste received at a C/DLF or ILF shall be calculated by dividing the total month's receipts by the total number of days in the reporting month. Records shall be maintained on the average daily volume of waste received at C/DLFs and ILFs. A quarterly report which summarizes the daily volumes, with volumes received reported in a format specified and approved by the Department, shall be submitted to the Department and maintained on file in the operating record of the facility by the permittee. If the average daily volume is exceeded for two or more consecutive quarters, by 20 percent or 100 tons/day, whichever is less, a modification would be required to adjust the permitted average daily volume.*

The Landfill is currently permitted to accept an average daily waste quantity of 2,500 tons per day. The site's operating record will maintain the daily waste volumes which will be submitted to the Department on a quarterly basis.

- (g) *Measures shall be taken to prevent the breeding or accumulation of disease vectors. If determined necessary by the Department or the State Health Department, additional disease vector control measures shall be conducted.*

Due to the nature of the waste disposed at this Landfill (C/D and approved Industrial wastes), vector control is not anticipated to be needed. In the event that vectors become more prevalent, measures will be taken to prevent the breeding or accumulation of disease vectors.

(3) Additional Requirements

- (a) Notwithstanding this rule, certain requirements for operating and maintaining a C/DLF or ILF may be enhanced or reduced by the Department as deemed necessary to comply with the Act and this Division. Any action by the Department to enhance or reduce the requirement(s) must be done in writing from the Department.*

Compliance with the Landfill permit and applicable regulations, either enhanced or reduced in writing by the Department, will be maintained.

Recordkeeping Requirements
(ADEM Adimn. Code r. 335-13-4-.29)

Recordkeeping shall be maintained as follows:

(1) Operating Record

The owner or operator of a MSWLF, C/DLF or ILF unit must record and retain in an operating record at the facility, or in an alternative location approved by the Department, the following information as it becomes available:

- (a) *Solid Waste Disposal Facility Permit as issued by the Department.*

The Landfill's permit will be maintained in the Landfill operating record.

- (b) *Permit application, operational narrative, and engineering drawings. This may include, but is not limited to:*

1. *Any location restriction demonstration required under 335-13-4-.01 of this Division;*

The required siting restriction information will be maintained in the Landfill operating record.

2. *Any MSWLF unit design documentation for placement of leachate or gas condensate in a MSWLF unit as required under 335-13-4-.22(1)(k) of this Division;*

Not applicable.

3. *Closure and post closure care plans as required by 335-13-4-.20 of this Division;*

The required closure and post-closure plans (May 2024) will be maintained in the Landfill operating record.

4. *Explosive gas monitoring plans as required by 335-13-4-.16 of this Division;*

The explosive gas monitoring plan (May 2024) will be maintained in the Landfill operating record.

5. *Corrective action plan, if necessary, which includes detection in assessment monitoring;*

Not applicable as the site is not required to have a groundwater monitoring network.

6. *Any other documentation submitted to the Department during the permitting process.*

Correspondence between Chambers County Landfill, LLC and the Department will be maintained in the Landfill operating record.

- (c) *Reports or documentation generated during the normal operation of the facility may include, but are not limited to:*

1. *Gas monitoring results from monitoring and any remediation plans required by 335-13-4-.16;*

The required explosive gas monitoring results will be maintained in the Landfill

operating record.

2. *Inspection records, training procedures, notification procedures, and other information required in 335-13-4-.21(1)(b);*

Inspection records, training procedures, notification procedures, and related information will be maintained in the Landfill operating record.

3. *Any monitoring, testing, or analytical data as required by 335-13-4-.20 of this Division concerning closure;*

Monitoring, testing, and analytical data associated closure of the Landfill will be maintained in the Landfill operating record.

4. *Any demonstration, certification, finding monitoring, testing, or analytical data required by 335-13-4-.27 concerning groundwater monitoring and corrective action;*

Not applicable as the site is not required to have a groundwater monitoring network.

5. *Quarterly volume reports as required in 335-13-4-.22(2)(g) or 335-13-4-.23(2)(f) of this Division;*

The required quarterly site volume reports will be maintained in the Landfill operating record.

6. *Waste certifications as required by 335-13-4-.21(1)(c) of this Division;*

The required waste certifications will be maintained in the Landfill operating record.

7. *Any other report or document generated in the normal operation of the facility which is submitted to the Department.*

Correspondence submitted to the Department will be maintained in the Landfill operating record.

- (d) *Any cost estimates and financial assurance documentation required by 335-13-4-.28.*

Financial assurance-related information will be maintained in the Landfill operating record.

Attachment A

Unauthorized Waste Identification Plan

**Operations Plan
Chambers County Landfill
Lanett, Alabama**

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Unauthorized Waste Identification and Prevention Plan

Chambers County
Landfill, LLC
7245 Veterans Memorial Parkway
Lanett, AL 36863

p. 334-209-3776

customercare@amwasteusa.com
www.amwaste.net/contact

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Executive Summary

This plan includes a comprehensive document that satisfies the requirements to comply with ADEM Admin. Code r.335-13-4-.21. It is the intent of the plan to provide the necessary training, education, and documentation that ensures compliance. Any questions regarding the plan and the intent must come from a careful examination of the entire code.

Highlights

- Sales process updates
- Educating the customer
- Good Inspections
- Employee awareness and attention

Objectives

By educating our people and customers, execute a plan that ensures compliance with ADEM Admin. Code r.335-13-4-.21(1)(b)

Mission Statement

Chambers County Landfill, LLC will comply with regulations by ensuring a plan is in place that gives our customers and employees the tools and information necessary to be compliant.

Keys to Success

- Develop a simple, effective plan.
- Educate the customer.
- Train employees.
- Monitor success.

Description of Plan

Training, education, and documentation constitute the key elements that will ensure success for the plan to prevent unauthorized waste in the Chambers County Landfill. The most effective best practice that ensures unauthorized waste does not enter the landfill begins at the point of sale and original agreements with collection, post-collection, and third party customers.

Sales Responsibility and Customer Education

Sales personnel, both inside and outside sales, will be responsible for educating customers at the point of sale. Unauthorized waste generated by the customer will have multiple options to either accept alternative collection methods such as commercial front load service for sanitary waste separated from the waste stream

that is permissible for our landfills. The customer may also choose to mix the waste and be quoted a sanitary rate for disposal at an MSW landfill in the vicinity. For all third party collection and disposal customer sales, it will be the responsibility of those delivering waste to the Chambers County Landfill facility to train and educate their employees on unacceptable waste that is not permitted to be delivered to the landfill.

All personnel having point of sale responsibilities will receive refresher training bi-annually regarding acceptable waste allowed in the Chambers County Landfill facility. Combined with this training, these employees will also be given acceptable options to offer the customer for other types of waste permitted for disposal elsewhere in the vicinity. The next best practice to ensure unauthorized waste is not delivered to our facility, is to educate collection drivers on what is acceptable and prevent unacceptable loads from leaving the customer's premises.

Driver Training

Amwaste will be the primary hauler to the Landfill. Amwaste drivers and all Amwaste collection company personnel will receive bi-annual training on unacceptable waste identification. In addition, drivers from 3rd party haulers will be presented with informational flyers to educate them on waste identification. These flyers will be distributed when haulers make their first trip to the facility, and on a semi-annual basis to all haulers. As the first level of compliance, the driver offers the best opportunity to prevent unauthorized waste from being delivered to one of our landfills.

Drivers will be fully empowered to refuse transportation for any loads suspected of containing unauthorized waste if load is designated to have final disposal at the Chambers County Landfill. The customer will be notified of the concern and an Amwaste supervisor will coordinate with the customer regarding options such as outlined in the Sales Responsibility and Customer Education section of the plan.

The final, and ultimate responsibility for ensuring compliance with ADEM Admin Code r.335-13-4-.21 will be those personnel located at the landfill.

Landfill Administration and Operator Training

Landfill administration such as scale operators and landfill supervisors, along with equipment operators on the working face, provide additional opportunities to visually identify and prevent unacceptable waste from being accepted on our landfills.

- Daily random inspections are a required best practice to ensure compliance. A minimum of one random load will be identified and receive a visual inspection at the scales before the truck is allowed to proceed to the active working face. The inspector at the scales will either proceed with the truck to do a final visual authentication of the entire load or will coordinate with the equipment operator to do so once the load is deposited at the face. The findings will be documented on the Landfill Load Inspection Form.
- Equipment operators at the working face are the final line of defense to ensure unacceptable waste is not received at the landfill. As a function of their responsibilities, Operators and any other facility

personnel will be attentive to all waste delivered and will ensure any violation is reported on the Landfill Load Inspection Form.

- Equipment operators, landfill administration, permanent laborers performing duties on site, and supervisory personnel will receive bi-annual training regarding waste identification. New hires will be trained on their first day.

The options available to ensure compliance include, but are not limited to:

1. Rejection of the entire load and communication with the generator to determine a proper, compliant course of action.
2. Allow the generator to physically remove the unacceptable waste and dispose of any material in a compliant way.
3. The physical removal of incidental, unauthorized small quantities of unacceptable waste at the working face by company personnel and taken to the commercial MSW container located at the facility.

Documentation and File Maintenance

- Random inspections will be performed daily. Final disposition of any unacceptable waste, if any, will be noted on the form.
- All unauthorized waste will be documented on the Landfill Load Inspection Form whether identified in a random inspection or by company personnel monitoring the working face.
- Inspection forms will be maintained on site and made available to ADEM personnel upon request.

This plan is prepared pursuant to the requirements to comply with ADEM Admin. Code r.335-13-4-.21. Any questions regarding required actions and responsibilities should be answered after a careful examination of the code.

Appendix

ADEM Admin Code r. 335-13-4-.21

Landfill Load Inspection Form

335-13-4-.21 General Operational Standards for Landfill Units. Any person or agency operating or planning to operate a landfill unit shall operate and maintain the facility consistent with this Division. General requirements for operating and maintaining an acceptable landfill unit shall be:

(1) General Operation.

(a) The operation and use of the landfill unit shall be as stipulated in the permit.

(b) Waste accepted at the facility shall be strictly controlled so as to allow only waste stipulated on the permit or otherwise as may be approved by the Department. The permittee of any facility permitted under these rules must have in the operating record a plan describing procedures the permittee will implement for detecting and preventing the disposal of free liquids, regulated hazardous wastes, regulated medical wastes, and regulated PCB wastes at the facility. This plan must include at a minimum:

1. Random inspections of incoming loads to ensure that incoming loads do not contain free liquids, regulated hazardous wastes, regulated medical wastes, or regulated PCB wastes.

2. Inspection of suspicious loads.

3. Records of all inspections to include the origin of waste suspected to be regulated hazardous, regulated medical, or regulated PCB waste, if known; transporters, to include transfer stations and all handlers of the waste en route to the disposal site; and any certifications from generators provided to the permittee or facility personnel. These records must be maintained on file in the operating record of the facility.

4. Training of facility personnel to recognize free liquids, regulated hazardous wastes, regulated medical wastes, and regulated PCB wastes.

5. Procedures for notifying the proper authorities if free liquids, regulated hazardous wastes, regulated medical wastes, or regulated PCB wastes are discovered at the facility.

6. Methods to identify all industrial users of the facility, producers of special wastes, and transporters of these wastes.

(c) Prior to disposal of industrial waste and/or medical waste, the permittee shall obtain from each generator a written certification that the material to be disposed does not contain free liquids, regulated hazardous wastes, regulated medical wastes, or regulated PCB wastes.

1. This certification may be based on laboratory analysis of the waste on a case-by-case basis, or documentation supporting the generator's knowledge of the wastestream(s), or as may be required by the Department.

2. Copies of the certification shall be submitted to the Department for disposal approval and for any specific requirements prior to disposal. After submittal of the required certification, the Department shall have five (5) working

days to respond. If no response is given, the permittee may dispose of the material as proposed.

3. In the case of one-time emergency disposal requests, the permittee shall submit the required certification no later than five (5) days after the disposal of waste.

4. Certification shall be renewed or revised biennially (every two years) or at such time that operational changes at the point of generation could render the waste hazardous, whichever is more frequent and submitted to the Department for approval.

5. Copies of these certifications and approvals shall be maintained on file in the operating record of the facility and shall be made available for the Department upon request.

6. The above requirements notwithstanding and, as may otherwise be required, pursuant to Division 13 rules, generators will not be required to submit certification to the Department provided that:

(i) The waste will be disposed of at a non-commercial industrial waste landfill which has been permitted by the Department, and is owned either exclusively or mutually by the generator(s) of the waste, and which disposes of waste generated only by the owner(s);

(ii) The wastestream(s) to be disposed of are specifically described in the Solid Waste Landfill Permit issued by the Department or in the final application as referenced by the permit for the site designated to receive the waste;

(iii) The required certification, as described above, is maintained on-site by the owner(s) of the landfill; and

(iv) The required certification, as described above, is made available for inspection by the Department upon request.

(d) The landfill unit shall be operated in such a manner that there will be no water pollution or unauthorized discharge.

1. Any discharge resulting from a landfill unit or practice may require:

(i) A National Pollutant Discharge Elimination System (NPDES) permit under the Alabama Water Pollution Control Act as issued by the Department.

(ii) A dredge or fill permit from the Army Corps of Engineers as required under Section 404 of the Clean Water Act, as amended; or

(iii) That a non-point source of surface waters does not violate an area wide or statewide water quality management plan that has been approved under the Alabama Water Pollution Control Act.

2. The groundwater shall not be contaminated as specified by this Division.

(e) The historic and certified disposal areas shall be identified with a sufficient number of permanent markers which are at least visible from one marker to the next.

(f) Measuring or weighing devices shall be required for all municipal solid waste landfill units accepting solid waste. All solid waste shall be properly measured or weighed prior to disposal unless otherwise approved by the Department.

(g) Deep rooted vegetation (with roots that may grow below the six inch erosion layer) shall be prohibited as vegetative cover.

(h) With the exception of very small quantity generator waste disposed of in municipal solid waste landfills, regulated hazardous waste, as defined by Division 14 of the ADEM Administrative Code, is prohibited from disposal in a non-hazardous landfill unit.

(2) Open Burning.

(a) Open burning of solid waste at any landfill unit is prohibited unless approved by the Department as follows:

1. Clearing debris at the landfill unit such as trees and stumps may be burned if prior approval is received from the Department and the Alabama Forestry Commission.

2. Emergency clean-up debris resulting from catastrophic incidents may be burned at a permitted landfill unit if consistent with the intent of this Division and air pollution control requirements. Prior approval must be received from this Department and other appropriate agencies.

3. If approved, the burning shall not occur over previously filled areas or within 200 feet of existing disposal operations unless otherwise specified by the Department and such burning shall not cause a public nuisance or pose a threat to public health.

(b) The person or agency requesting permission to burn solid waste shall apply in writing to the Department, outlining why a burn request should be granted. This request should include, but not be limited to, specifically what areas will be utilized, types of waste to be burned, the projected starting and completion dates for the project, and the projected days and hours of operation.

Author: Russell A. Kelly; S. Scott Story; Heather M. Jones.

Statutory Authority: Code of Alabama 1975, §§ 22-22A-5, 22-27-3, 22-27-4, 22-27-7, 22-27-47, 22-27-48.

History: Effective: November 18, 1981. **Amended:** Effective: March 31, 1988 (Emergency Regulations). **Amended:** Effective: July 21, 1988. **Amended:** Effective: October 2, 1990. **Amended:** Effective: November 2, 1993. **Amended:** Effective: July 26, 1996. **Amended:** Filed: April 24, 2018; Effective: June 8, 2018; **Amended:** Filed: June 25, 2019; Effective: August 9, 2019. **Amended:** Filed: October 29, 2021; Effective: December 13, 2021.

Inspection Form

Type of Inspection: Random Suspicious Load

Date:

Hauling Company:

Any material that does not belong in the landfill? *(such as free liquids [no bulk or noncontainerized liquid waste, or containers capable of holding liquids], regulated hazardous wastes, regulated medical wastes, regulated PCB wastes or other unacceptable wastes)* Please circle one

YES

NO

If YES, what was done with the material?

If Yes, what is the origin of waste? *(Include transporters, transfer stations and all handlers of the waste enroute to the disposal site)*

Were any certifications from generators provided? Please circle one
If YES, attach to this form

YES

NO

Type of Inspection: Random Suspicious Load

Date:

Hauling Company:

Any material that does not belong in the landfill? *(such as free liquids [no bulk or noncontainerized liquid waste, or containers capable of holding liquids], regulated hazardous wastes, regulated medical wastes, regulated PCB wastes or other unacceptable wastes)* Please circle one

YES

NO

If YES, what was done with the material?

If Yes, what is the origin of waste? *(Include transporters, transfer stations and all handlers of the waste enroute to the disposal site)*

Were any certifications from generators provided? Please circle one
If YES, attach to this form

YES

NO

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SMITH + GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



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| 1.3 | Contact Information..... | 1 |
| 1.4 | Existing Site Conditions and Proposed Development..... | 2 |
| 1.5 | Site Soils Information..... | 2 |
| 2.0 | DESIGN GUIDELINES AND PROCEDURES | 2 |
| 3.0 | RUNOFF CALCULATIONS | 3 |

APPENDICES

- Appendix A Erosion and Sedimentation Control Calculations
 - A.1 Drainage and E&S Control Calculations - Overview
 - A.2 Analysis of Design Storms
 - A.3 Stormwater Routing (HydroCAD output)
 - A.4 Drainage Channel Analysis
 - A.5 Culvert and Outlet Protection Analysis

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Chambers County Landfill, LLC currently operates a Construction & Demolition (C&D) Landfill at their landfill facility located at Veterans Memorial Highway near Lanett. The proposed Western Expansion of the landfill will increase the currently-permitted 19.6-acre disposal area to a new total of 27.9 acres. The construction and operation of the landfill expansion will require the disturbance of approximately 10 acres. The accompanying calculations were made to design and size the proposed erosion and sediment control measures to be used at the site for both initial and long term (final) conditions. The design drawings with the locations and details for the sediment and erosion control components are shown on the Permit Application drawings for the Western Expansion (2024, S+G and Browne & Company).

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The site is shown on the accompanying set of plans. Additional information is as follows:

| | |
|---|--|
| Address: | 7245 Veterans Memorial Pkwy Lanett, AL 36863 |
| Coordinates (Site Entrance): | Latitude 32.85 degrees North Longitude 77.81 degrees East |
| River Basin: | Chattahoochee River |
| Receiving Stream: | Little Osanippa Creek |

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For questions regarding this erosion and sedimentation control plan, the people to contact are:

Engineer:
Smith Gardner, Inc.
Attn.: John M. Gardner, P.E.
14 N. Boylan Ave.
Raleigh, NC 27603
Phone: (919) 828-0577
Fax: (919) 828-3899
Email: john@smithgardnerinc.com.

The **contact** if sediment control issues arise during the land-disturbing activity is:

Owner:
Chambers County Landfill, LLC
Attn: Charles M. Russell, III (CEO)
P.O. Box 86 (420 W. 7TH Street)
West Point, GA
(205) 788-1400

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The existing site is an operating C&D landfill. The remaining northernmost cells are used as a soil borrow area for excavating periodic (weekly) cover soil for the incoming waste. The existing terrain generally falls from east to west. Runoff from uncovered waste is not allowed to leave the disposal area, but all other runoff from the landfill is routed to the two (2) existing sediment ponds west of the landfill.

The Western Expansion is proposed as three (3) new cells, to be constructed after the currently permitted Cell 19 is operational. The first cell of the western Expansion is Cell 20, which is located between the existing sediment ponds. To construct Cell 20, the new Sediment Pond SP-3 will be constructed. SP-3 is sized to eventually treat all runoff from the landfill.

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The native surficial soils at the site fall are generally under the categories of Appling sandy clay loam or Lloyd sandy loam and Wilkes sandy loam according to the USDA Natural Resources Conservation Service soil survey (see **attached** soil survey map (USDA NRCS Soils Map)). The Enon and Wilkes soils, as well as the majority of imported borrow soils to be used in site construction can be classified as being in hydrologic soil group (HSG) "B" for purposes of runoff calculations.

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The erosion and sediment control design for the landfill was conducted based on guidelines and procedures as set forth in the following references:

- A. HydroCAD Software Solutions, LLC (2006), HydroCAD Stormwater Modeling System Owner's Manual - Version 8, Chocorua, NH.
- B. Alabama Soil and Water Conservation Committee (2022), "Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas", July 2022.

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All stormwater flow volumes were calculated using the HydroCAD computer program (utilizing USDA-NRCS (SCS) methods) based on a 25 year 24-hour storm event. Rainfall quantities and/or intensities used in the analyses were derived from an analysis of design storms for the site. Drainage areas were determined using a planimeter and/or AutoCAD on topographic sheets of the project area. For each drainage area, runoff curve numbers (SCS methods) were selected based on the typical soils mapped at the site and assumed ground cover conditions. Times of concentration were calculated by HydroCAD using SCS methods, with a minimum time of concentration of 5 minutes used in the calculations.

For the channels and culverts, the lining stresses were varied using the flow output from HydroCAD.

The proposed final cover diversions will all have the same lining. The lining was evaluated based on the largest area flowing to diversion.

The Rock Chutes used in the final cover were sized based on the contributing area to each individual chute. The individual diversions were not evaluated.

The Sediment Pond was designed to have minimal or no flow based on a 25-year/214-hour storm event. The runoff from a 100-year/214-hour storm event is contained in the Sediment Pond without discharging through the emergency spillway.

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- A.1 Drainage and E&S Control Calculations - Overview
- A.2 Analysis of Design Storms
- A.3 Stormwater Routing (HydroCAD output)*
 - 25-Year 24-Hour Storm (All drainage areas, channels, culverts, and ponds)
 - 10-Year 24-Hour Storm for the sediment pond
 - 100-Year 24-Hour Storm for the sediment pond
- A.4 Drainage Channel Analysis
- A.5 Culvert and Outlet Protection Analysis

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PROJECT Chambers County Landfill, LLCSHEET 1 OF 1DATE 4/17/2024SUBJECT Drainage & E&SC Calcs. - OverviewJOB # CHAMBERS-23-1COMPUTED BY _____
CHECKED BY _____**OBJECTIVE:**

To design stormwater conveyance, detention, and erosion and sedimentation control measures to remove and contain stormwater flow from the design storm. The design of these measures will be based on:

- Design storm information for the site;
- Peak discharge calculations using the Rational Method and/or USDA-NRCS (SCS) Methods; and
- Stormwater routing using USDA-NRCS (SCS) or other methods.

REFERENCES:

Debo, T.N., and Reese, A.J. (1995), Municipal Storm Water Management, Lewis Publishers, Boca Raton, FL.

Federal Highway Administration (2001), Urban Drainage Design Manual, Hydraulic Engineering Circular No. 22, FHWA NHI-01-021, Second Ed., U.S. Dept. of Transportation, Washington, D.C.

Alabama Soil and Water Conservation Committee (2022), "Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas", July 2022.

HydroCAD Software Solutions, LLC (2006), HydroCAD Stormwater Modeling System Owner's Manual - Version 8, Chocorua, NH.

USDA-NRCS (1992), Computer Program for Project Formulation Hydrology (TR-20).

USDA-NRCS (1986 & 1999 Update), Urban Hydrology for Small Watersheds (TR-55).

ANALYSIS:

The main design criteria will be to ensure that all stormwater conveyance and detention measures will be able to accommodate the runoff from the design storm. Drainage channels, culverts, etc. were designed based on the peak discharge to each measure. Detention measures were designed based on stormwater routing methods and/or State/local criteria.

CALCULATIONS:**- Peak Discharge Calculations:****USDA-NRCS (SCS) Methods:**

Use HydroCAD program to determine the peak discharge to each device or structure. HydroCAD is based on the SCS unit hydrograph procedure, which is a principal component of NRCS TR-20. Alternatively spreadsheets can be used to determine flow rates using the procedures detailed in NRCS TR-55.

Time of Concentration:

The time of concentration for use in determining the peak discharge in the NRCS and/or Rational methods can be determined by the methods detailed in NRCS TR-55 or other methods. HydroCAD uses the NRCS methods.

- Stormwater Routing:

Stormwater routing was accomplished using the HydroCAD program, which is based on USDA-NRCS (SCS) methods. Unless otherwise specified, the unit hydrograph method was used. The storm type (i.e. Type I 24-hr., Type II 24-hr., etc.) was selected as appropriate for the project location.

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NOAA Atlas 14, Volume 9, Version 2
Location name: Lanett, Alabama, USA*
Latitude: 32.8558°, Longitude: -85.2854°
Elevation: 717 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

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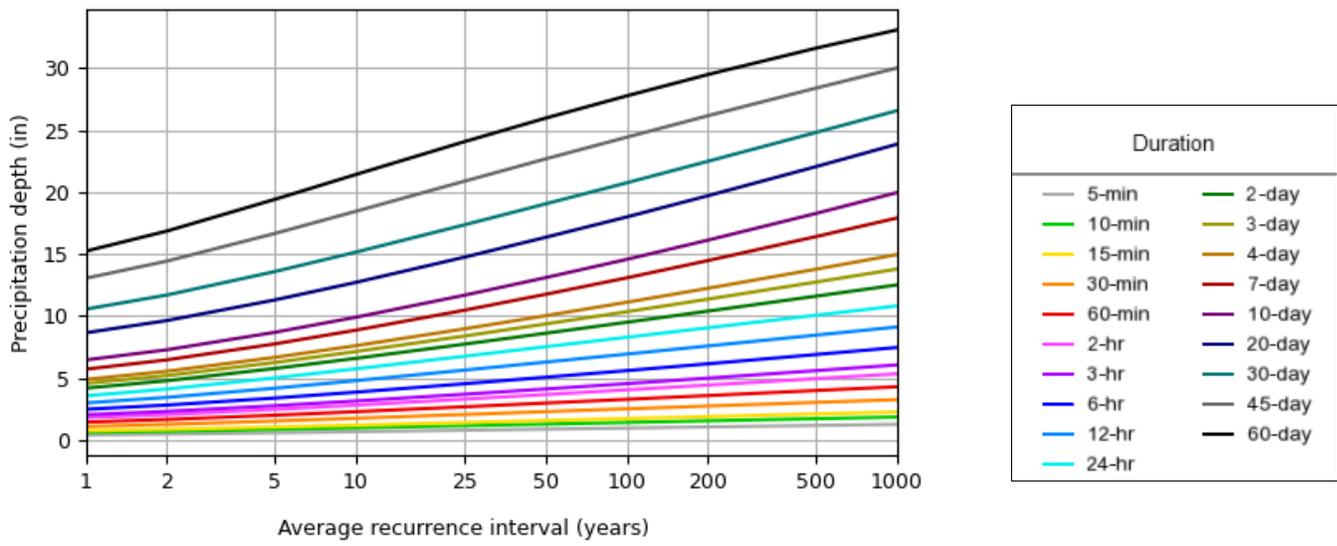
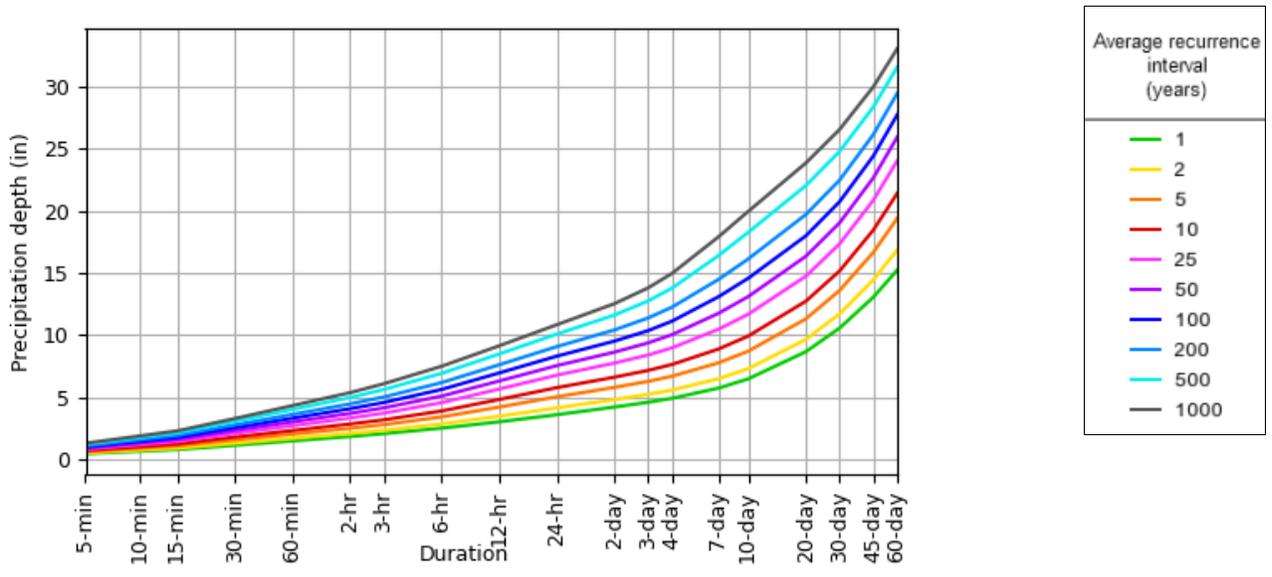
| PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹ | | | | | | | | | | |
|--|-------------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|
| Duration | Average recurrence interval (years) | | | | | | | | | |
| | 1 | 2 | 5 | 10 | 25 | 50 | 100 | 200 | 500 | 1000 |
| 5-min | 0.422 (0.341-0.517) | 0.486 (0.392-0.596) | 0.590 (0.475-0.724) | 0.675 (0.542-0.831) | 0.793 (0.622-0.989) | 0.882 (0.682-1.11) | 0.972 (0.735-1.23) | 1.06 (0.782-1.37) | 1.18 (0.847-1.54) | 1.27 (0.896-1.67) |
| 10-min | 0.617 (0.499-0.757) | 0.711 (0.574-0.873) | 0.863 (0.696-1.06) | 0.989 (0.794-1.22) | 1.16 (0.911-1.45) | 1.29 (0.999-1.62) | 1.42 (1.08-1.81) | 1.56 (1.14-2.00) | 1.73 (1.24-2.25) | 1.86 (1.31-2.44) |
| 15-min | 0.753 (0.608-0.924) | 0.867 (0.700-1.06) | 1.05 (0.848-1.29) | 1.21 (0.968-1.48) | 1.42 (1.11-1.77) | 1.58 (1.22-1.98) | 1.74 (1.31-2.20) | 1.90 (1.40-2.44) | 2.11 (1.51-2.75) | 2.26 (1.60-2.98) |
| 30-min | 1.10 (0.887-1.35) | 1.27 (1.02-1.55) | 1.54 (1.24-1.89) | 1.76 (1.41-2.17) | 2.06 (1.62-2.57) | 2.29 (1.77-2.88) | 2.52 (1.90-3.20) | 2.75 (2.02-3.53) | 3.04 (2.18-3.96) | 3.26 (2.30-4.29) |
| 60-min | 1.45 (1.17-1.78) | 1.66 (1.34-2.04) | 2.01 (1.62-2.46) | 2.29 (1.84-2.82) | 2.68 (2.11-3.35) | 2.98 (2.31-3.75) | 3.28 (2.49-4.18) | 3.59 (2.64-4.62) | 4.00 (2.87-5.21) | 4.30 (3.04-5.66) |
| 2-hr | 1.81 (1.48-2.19) | 2.06 (1.68-2.50) | 2.47 (2.02-3.00) | 2.82 (2.29-3.43) | 3.30 (2.62-4.08) | 3.67 (2.88-4.57) | 4.05 (3.10-5.10) | 4.44 (3.31-5.66) | 4.95 (3.60-6.41) | 5.34 (3.82-6.98) |
| 3-hr | 2.04 (1.68-2.46) | 2.31 (1.90-2.79) | 2.77 (2.27-3.34) | 3.15 (2.58-3.81) | 3.69 (2.96-4.55) | 4.12 (3.25-5.10) | 4.55 (3.51-5.71) | 5.00 (3.75-6.35) | 5.60 (4.10-7.22) | 6.06 (4.36-7.88) |
| 6-hr | 2.48 (2.06-2.96) | 2.82 (2.35-3.36) | 3.39 (2.81-4.04) | 3.87 (3.20-4.62) | 4.54 (3.68-5.53) | 5.06 (4.04-6.21) | 5.60 (4.37-6.96) | 6.15 (4.68-7.75) | 6.90 (5.11-8.82) | 7.47 (5.43-9.63) |
| 12-hr | 2.99 (2.52-3.52) | 3.44 (2.90-4.06) | 4.18 (3.51-4.93) | 4.79 (4.01-5.67) | 5.64 (4.61-6.77) | 6.28 (5.06-7.61) | 6.93 (5.47-8.51) | 7.59 (5.83-9.46) | 8.46 (6.33-10.7) | 9.12 (6.71-11.7) |
| 24-hr | 3.56 (3.04-4.15) | 4.12 (3.50-4.79) | 5.01 (4.26-5.84) | 5.75 (4.87-6.72) | 6.75 (5.59-8.02) | 7.52 (6.13-9.01) | 8.29 (6.61-10.1) | 9.06 (7.03-11.2) | 10.1 (7.62-12.6) | 10.8 (8.06-13.7) |
| 2-day | 4.18 (3.61-4.81) | 4.78 (4.12-5.50) | 5.77 (4.96-6.65) | 6.59 (5.65-7.62) | 7.73 (6.48-9.10) | 8.61 (7.11-10.2) | 9.50 (7.67-11.4) | 10.4 (8.18-12.7) | 11.6 (8.89-14.5) | 12.5 (9.43-15.8) |
| 3-day | 4.57 (3.97-5.22) | 5.20 (4.52-5.94) | 6.26 (5.42-7.16) | 7.14 (6.16-8.19) | 8.38 (7.09-9.82) | 9.36 (7.79-11.0) | 10.3 (8.43-12.4) | 11.4 (9.01-13.9) | 12.7 (9.84-15.8) | 13.8 (10.5-17.3) |
| 4-day | 4.89 (4.27-5.55) | 5.55 (4.84-6.31) | 6.67 (5.80-7.59) | 7.62 (6.61-8.70) | 8.96 (7.62-10.5) | 10.0 (8.39-11.8) | 11.1 (9.10-13.3) | 12.2 (9.76-14.9) | 13.8 (10.7-17.0) | 15.0 (11.4-18.7) |
| 7-day | 5.71 (5.04-6.42) | 6.47 (5.70-7.28) | 7.75 (6.82-8.74) | 8.86 (7.76-10.0) | 10.5 (9.01-12.1) | 11.7 (9.95-13.7) | 13.1 (10.8-15.5) | 14.5 (11.7-17.5) | 16.4 (12.9-20.2) | 17.9 (13.8-22.2) |
| 10-day | 6.46 (5.73-7.22) | 7.28 (6.46-8.14) | 8.69 (7.68-9.73) | 9.91 (8.73-11.1) | 11.7 (10.1-13.5) | 13.1 (11.2-15.2) | 14.6 (12.1-17.2) | 16.1 (13.1-19.4) | 18.3 (14.4-22.4) | 20.0 (15.5-24.6) |
| 20-day | 8.65 (7.77-9.55) | 9.64 (8.65-10.6) | 11.3 (10.1-12.5) | 12.7 (11.4-14.1) | 14.7 (12.9-16.8) | 16.3 (14.1-18.7) | 18.0 (15.2-21.0) | 19.7 (16.2-23.4) | 22.0 (17.6-26.7) | 23.9 (18.7-29.2) |
| 30-day | 10.6 (9.55-11.6) | 11.7 (10.6-12.8) | 13.6 (12.3-14.9) | 15.2 (13.6-16.7) | 17.3 (15.3-19.5) | 19.0 (16.5-21.6) | 20.7 (17.6-24.0) | 22.5 (18.6-26.5) | 24.8 (20.0-29.8) | 26.6 (21.0-32.4) |
| 45-day | 13.0 (11.9-14.2) | 14.4 (13.2-15.7) | 16.7 (15.1-18.2) | 18.5 (16.7-20.2) | 20.9 (18.4-23.2) | 22.7 (19.8-25.5) | 24.4 (20.8-28.0) | 26.2 (21.7-30.6) | 28.4 (23.0-33.9) | 30.0 (23.9-36.4) |
| 60-day | 15.2 (14.0-16.5) | 16.9 (15.4-18.3) | 19.4 (17.7-21.1) | 21.4 (19.5-23.3) | 24.0 (21.3-26.6) | 26.0 (22.7-29.0) | 27.8 (23.8-31.6) | 29.5 (24.6-34.2) | 31.6 (25.7-37.5) | 33.1 (26.5-40.0) |

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

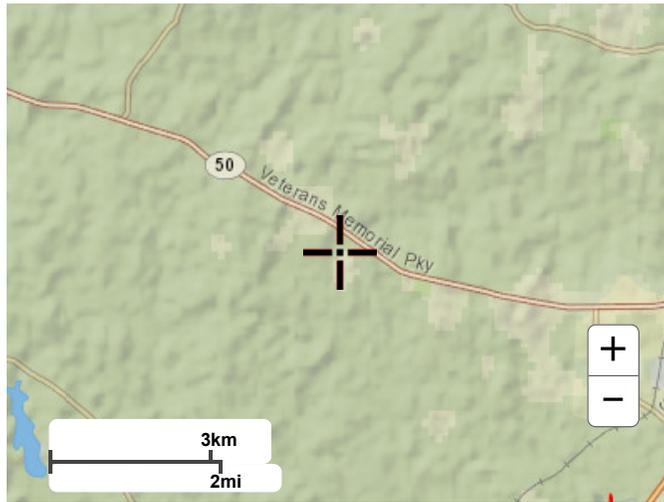
PDS-based depth-duration-frequency (DDF) curves
Latitude: 32.8558°, Longitude: -85.2854°



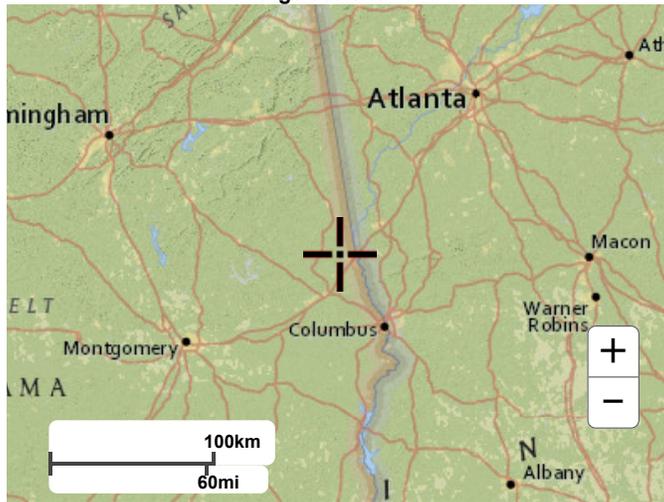
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Maps & aerials

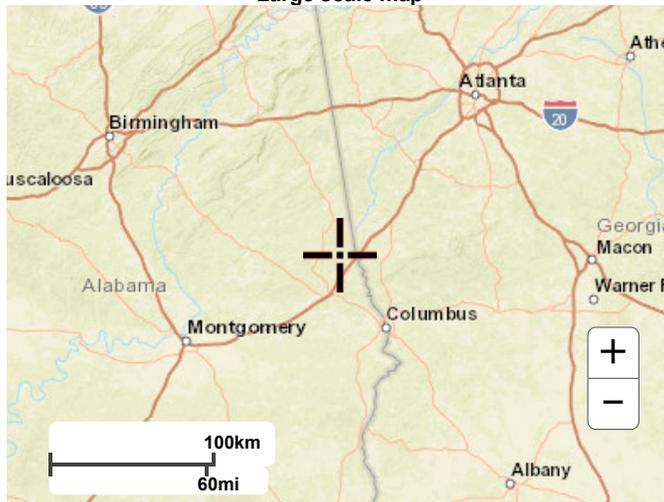
Small scale terrain



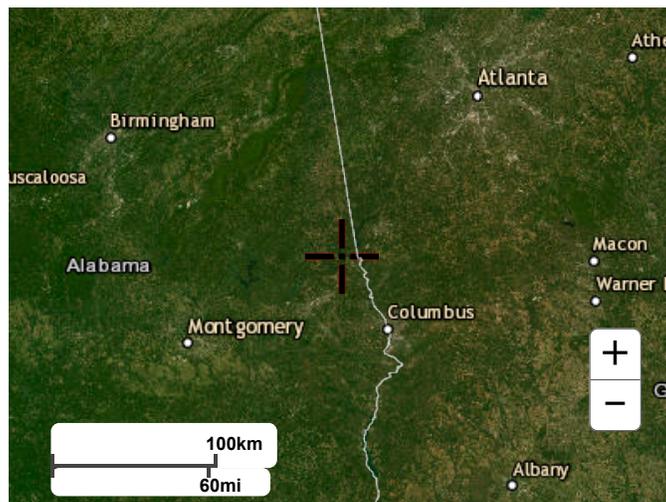
Large scale terrain



Large scale map



Large scale aerial



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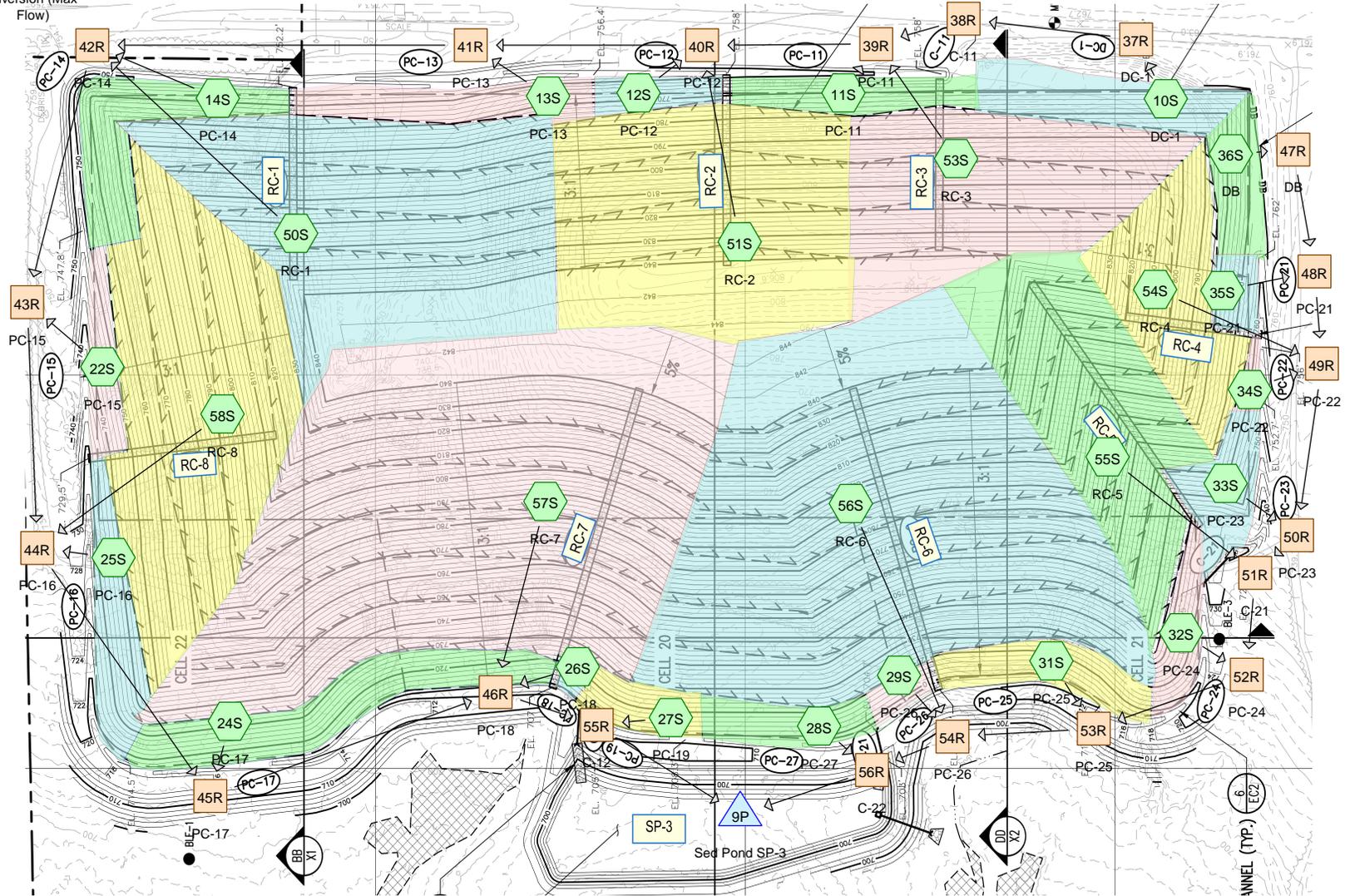
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302S
Final Cover
Diversion (Max
Flow)



Subcat

Reach

Pond

Link

Drainage Diagram for Chambers 4-11-24
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Chambers 4-11-24

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Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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4/18/2024

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| | |
|--------------------------------|---|
| Subcatchment 10S: DC-1 | Runoff Area=26,080 sf Runoff Depth>3.24" Tc=5.0 min CN=71 Runoff=3.78 cfs 0.162 af |
| Subcatchment 11S: PC-11 | Runoff Area=16,972 sf Runoff Depth>3.34" Tc=5.0 min CN=72 Runoff=2.52 cfs 0.108 af |
| Subcatchment 12S: PC-12 | Runoff Area=9,448 sf Runoff Depth>3.44" Tc=5.0 min CN=73 Runoff=1.44 cfs 0.062 af |
| Subcatchment 13S: PC-13 | Runoff Area=21,829 sf Runoff Depth>3.44" Tc=5.0 min CN=73 Runoff=3.33 cfs 0.144 af |
| Subcatchment 14S: PC-14 | Runoff Area=28,955 sf Runoff Depth>3.44" Tc=5.0 min CN=73 Runoff=4.42 cfs 0.191 af |
| Subcatchment 22S: PC-15 | Runoff Area=20,391 sf Runoff Depth>3.44" Tc=5.0 min CN=73 Runoff=3.11 cfs 0.134 af |
| Subcatchment 24S: PC-17 | Runoff Area=39,591 sf Runoff Depth>3.34" Tc=5.0 min CN=72 Runoff=5.89 cfs 0.253 af |
| Subcatchment 25S: PC-16 | Runoff Area=16,420 sf Runoff Depth>3.44" Tc=5.0 min CN=73 Runoff=2.51 cfs 0.108 af |
| Subcatchment 26S: PC-18 | Runoff Area=2,623 sf Runoff Depth>3.44" Tc=5.0 min CN=73 Runoff=0.40 cfs 0.017 af |
| Subcatchment 27S: PC-19 | Runoff Area=11,627 sf Runoff Depth>3.24" Tc=5.0 min CN=71 Runoff=1.68 cfs 0.072 af |
| Subcatchment 28S: PC-27 | Runoff Area=13,621 sf Runoff Depth>3.24" Tc=5.0 min CN=71 Runoff=1.97 cfs 0.084 af |
| Subcatchment 29S: PC-26 | Runoff Area=4,951 sf Runoff Depth>3.44" Tc=5.0 min CN=73 Runoff=0.76 cfs 0.033 af |
| Subcatchment 31S: PC-25 | Runoff Area=18,477 sf Runoff Depth>3.24" Tc=5.0 min CN=71 Runoff=2.68 cfs 0.115 af |
| Subcatchment 32S: PC-24 | Runoff Area=12,454 sf Runoff Depth>3.34" Tc=5.0 min CN=72 Runoff=1.85 cfs 0.080 af |
| Subcatchment 33S: PC-23 | Runoff Area=16,659 sf Runoff Depth>3.24" Tc=5.0 min CN=71 Runoff=2.41 cfs 0.103 af |

Chambers 4-11-24

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Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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| | |
|--|--|
| Subcatchment 34S: PC-22 | Runoff Area=1,850 sf Runoff Depth>3.05" Tc=5.0 min CN=69 Runoff=0.25 cfs 0.011 af |
| Subcatchment 35S: PC-21 | Runoff Area=6,550 sf Runoff Depth>3.14" Tc=5.0 min CN=70 Runoff=0.92 cfs 0.039 af |
| Subcatchment 36S: DB | Runoff Area=12,132 sf Runoff Depth>3.05" Tc=5.0 min CN=69 Runoff=1.66 cfs 0.071 af |
| Subcatchment 50S: RC-1 | Runoff Area=134,620 sf Runoff Depth>3.05" Flow Length=283' Slope=0.1100 '/ Tc=4.8 min CN=69 Runoff=18.58 cfs 0.784 af |
| Subcatchment 51S: RC-2 | Runoff Area=111,957 sf Runoff Depth>3.04" Flow Length=638' Slope=0.0660 '/ Tc=11.8 min CN=69 Runoff=12.16 cfs 0.651 af |
| Subcatchment 53S: RC-3 | Runoff Area=81,006 sf Runoff Depth>3.05" Tc=5.0 min CN=69 Runoff=11.08 cfs 0.472 af |
| Subcatchment 54S: RC-4 | Runoff Area=40,485 sf Runoff Depth>3.05" Tc=5.0 min CN=69 Runoff=5.54 cfs 0.236 af |
| Subcatchment 55S: RC-5 | Runoff Area=73,450 sf Runoff Depth>3.05" Tc=5.0 min CN=69 Runoff=10.04 cfs 0.428 af |
| Subcatchment 56S: RC-6 | Runoff Area=236,187 sf Runoff Depth>3.04" Flow Length=332' Slope=0.0990 '/ Tc=5.7 min CN=69 Runoff=31.30 cfs 1.376 af |
| Subcatchment 57S: RC-7 | Runoff Area=278,196 sf Runoff Depth>3.04" Flow Length=537' Slope=0.0720 '/ Tc=9.9 min CN=69 Runoff=32.16 cfs 1.618 af |
| Subcatchment 58S: RC-8 | Runoff Area=104,346 sf Runoff Depth>3.04" Flow Length=404' Slope=0.0300 '/ Tc=12.2 min CN=69 Runoff=11.19 cfs 0.606 af |
| Subcatchment 302S: Final Cover Diversion (Max Flow) | Runoff Area=44,690 sf Runoff Depth>4.06" Tc=5.0 min CN=79 Runoff=7.84 cfs 0.347 af |
| Reach 37R: DC-1 | Avg. Depth=0.57' Max Vel=5.64 fps Inflow=3.78 cfs 0.162 af n=0.022 L=275.0' S=0.0436 '/ Capacity=104.79 cfs Outflow=3.60 cfs 0.162 af |
| Reach 38R: C-11 | Avg. Depth=0.37' Max Vel=8.84 fps Inflow=3.60 cfs 0.162 af D=24.0" n=0.022 L=48.0' S=0.1250 '/ Capacity=47.26 cfs Outflow=3.59 cfs 0.162 af |
| Reach 39R: PC-11 | Avg. Depth=0.83' Max Vel=3.54 fps Inflow=17.01 cfs 0.742 af n=0.035 L=293.0' S=0.0137 '/ Capacity=213.85 cfs Outflow=15.93 cfs 0.740 af |
| Reach 40R: PC-12 | Avg. Depth=1.19' Max Vel=3.74 fps Inflow=28.68 cfs 1.453 af n=0.035 L=183.0' S=0.0104 '/ Capacity=186.49 cfs Outflow=27.77 cfs 1.450 af |
| Reach 41R: PC-13 | Avg. Depth=1.20' Max Vel=3.80 fps Inflow=29.82 cfs 1.594 af n=0.035 L=404.0' S=0.0104 '/ Capacity=186.62 cfs Outflow=28.46 cfs 1.588 af |

Chambers 4-11-24

Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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| | |
|-------------------------|--|
| Reach 42R: PC-14 | Avg. Depth=1.42' Max Vel=4.20 fps Inflow=42.60 cfs 2.563 af n=0.035 L=580.0' S=0.0107 '/ Capacity=189.23 cfs Outflow=40.83 cfs 2.553 af |
| Reach 43R: PC-15 | Avg. Depth=0.96' Max Vel=7.32 fps Inflow=42.05 cfs 2.687 af n=0.035 L=404.0' S=0.0495 '/ Capacity=407.23 cfs Outflow=41.10 cfs 2.682 af |
| Reach 44R: PC-16 | Avg. Depth=1.16' Max Vel=7.10 fps Inflow=52.50 cfs 3.397 af n=0.035 L=303.0' S=0.0380 '/ Capacity=356.57 cfs Outflow=51.65 cfs 3.392 af |
| Reach 45R: PC-17 | Avg. Depth=1.55' Max Vel=4.77 fps Inflow=53.22 cfs 3.645 af n=0.035 L=600.0' S=0.0125 '/ Capacity=204.63 cfs Outflow=51.93 cfs 3.631 af |
| Reach 46R: PC-18 | Avg. Depth=1.84' Max Vel=5.20 fps Inflow=73.44 cfs 5.266 af n=0.035 L=48.0' S=0.0125 '/ Capacity=204.63 cfs Outflow=72.65 cfs 5.265 af |
| Reach 47R: DB | Avg. Depth=0.61' Max Vel=1.69 fps Inflow=1.66 cfs 0.071 af n=0.035 L=232.0' S=0.0086 '/ Capacity=17.39 cfs Outflow=1.50 cfs 0.070 af |
| Reach 48R: PC-21 | Avg. Depth=0.14' Max Vel=3.83 fps Inflow=2.25 cfs 0.110 af n=0.035 L=48.0' S=0.1250 '/ Capacity=647.10 cfs Outflow=2.24 cfs 0.110 af |
| Reach 49R: PC-22 | Avg. Depth=0.38' Max Vel=4.26 fps Inflow=7.84 cfs 0.356 af n=0.035 L=70.0' S=0.0471 '/ Capacity=397.39 cfs Outflow=7.74 cfs 0.356 af |
| Reach 50R: PC-23 | Avg. Depth=0.35' Max Vel=6.14 fps Inflow=10.06 cfs 0.460 af n=0.035 L=216.0' S=0.1093 '/ Capacity=604.98 cfs Outflow=9.85 cfs 0.459 af |
| Reach 51R: C-21 | Avg. Depth=1.70' Max Vel=5.45 fps Inflow=19.48 cfs 0.887 af D=30.0" n=0.022 L=60.0' S=0.0100 '/ Capacity=24.24 cfs Outflow=19.41 cfs 0.887 af |
| Reach 52R: PC-24 | Avg. Depth=0.53' Max Vel=7.84 fps Inflow=21.20 cfs 0.966 af n=0.035 L=216.0' S=0.1093 '/ Capacity=604.98 cfs Outflow=20.81 cfs 0.965 af |
| Reach 53R: PC-25 | Avg. Depth=0.57' Max Vel=8.00 fps Inflow=23.31 cfs 1.080 af n=0.035 L=221.0' S=0.1050 '/ Capacity=593.01 cfs Outflow=22.84 cfs 1.079 af |
| Reach 54R: PC-26 | Avg. Depth=1.59' Max Vel=4.78 fps Inflow=54.41 cfs 2.487 af n=0.035 L=97.0' S=0.0124 '/ Capacity=203.57 cfs Outflow=53.66 cfs 2.485 af |
| Reach 55R: C-12 | Avg. Depth=2.50' Max Vel=6.80 fps Inflow=73.77 cfs 5.337 af D=30.0" n=0.022 L=40.0' S=0.0150 '/ Capacity=59.37 cfs Outflow=63.77 cfs 5.336 af |
| Reach 56R: C-22 | Avg. Depth=1.91' Max Vel=6.87 fps Inflow=55.50 cfs 2.570 af D=30.0" n=0.022 L=40.0' S=0.0150 '/ Capacity=59.37 cfs Outflow=55.26 cfs 2.569 af |

Total Runoff Area = 31.808 ac Runoff Volume = 8.305 af Average Runoff Depth = 3.13"
100.00% Pervious Area = 31.808 ac 0.00% Impervious Area = 0.000 ac

Subcatchment 10S: DC-1

Runoff = 3.78 cfs @ 11.96 hrs, Volume= 0.162 af, Depth> 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 23,080 | 69 | 50-75% Grass cover, Fair, HSG B |
| 3,000 | 85 | Gravel roads, HSG B |
| 26,080 | 71 | Weighted Average |
| 26,080 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 11S: PC-11

Runoff = 2.52 cfs @ 11.96 hrs, Volume= 0.108 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 13,456 | 69 | 50-75% Grass cover, Fair, HSG B |
| 3,516 | 85 | Gravel roads, HSG B |
| 16,972 | 72 | Weighted Average |
| 16,972 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 12S: PC-12

Runoff = 1.44 cfs @ 11.96 hrs, Volume= 0.062 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 7,252 | 69 | 50-75% Grass cover, Fair, HSG B |
| 2,196 | 85 | Gravel roads, HSG B |
| 9,448 | 73 | Weighted Average |
| 9,448 | | Pervious Area |

Chambers 4-11-24

Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 13S: PC-13

Runoff = 3.33 cfs @ 11.96 hrs, Volume= 0.144 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 16,981 | 69 | 50-75% Grass cover, Fair, HSG B |
| 4,848 | 85 | Gravel roads, HSG B |
| 21,829 | 73 | Weighted Average |
| 21,829 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 14S: PC-14

Runoff = 4.42 cfs @ 11.96 hrs, Volume= 0.191 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 21,995 | 69 | 50-75% Grass cover, Fair, HSG B |
| 6,960 | 85 | Gravel roads, HSG B |
| 28,955 | 73 | Weighted Average |
| 28,955 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 22S: PC-15

Runoff = 3.11 cfs @ 11.96 hrs, Volume= 0.134 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 15,541 | 69 | 50-75% Grass cover, Fair, HSG B |
| 4,850 | 85 | Gravel roads, HSG B |
| 20,391 | 73 | Weighted Average |
| 20,391 | | Pervious Area |

Chambers 4-11-24

Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 24S: PC-17

Runoff = 5.89 cfs @ 11.96 hrs, Volume= 0.253 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 32,391 | 69 | 50-75% Grass cover, Fair, HSG B |
| 7,200 | 85 | Gravel roads, HSG B |
| 39,591 | 72 | Weighted Average |
| 39,591 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 25S: PC-16

Runoff = 2.51 cfs @ 11.96 hrs, Volume= 0.108 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 12,784 | 69 | 50-75% Grass cover, Fair, HSG B |
| 3,636 | 85 | Gravel roads, HSG B |
| 16,420 | 73 | Weighted Average |
| 16,420 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 26S: PC-18

Runoff = 0.40 cfs @ 11.96 hrs, Volume= 0.017 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 2,047 | 69 | 50-75% Grass cover, Fair, HSG B |
| 576 | 85 | Gravel roads, HSG B |
| 2,623 | 73 | Weighted Average |

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Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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2,623 Pervious Area

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 27S: PC-19

Runoff = 1.68 cfs @ 11.96 hrs, Volume= 0.072 af, Depth> 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 9,827 | 69 | 50-75% Grass cover, Fair, HSG B |
| 1,800 | 85 | Gravel roads, HSG B |
| 11,627 | 71 | Weighted Average |
| 11,627 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 28S: PC-27

Runoff = 1.97 cfs @ 11.96 hrs, Volume= 0.084 af, Depth> 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 11,721 | 69 | 50-75% Grass cover, Fair, HSG B |
| 1,900 | 85 | Gravel roads, HSG B |
| 13,621 | 71 | Weighted Average |
| 13,621 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 29S: PC-26

Runoff = 0.76 cfs @ 11.96 hrs, Volume= 0.033 af, Depth> 3.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 3,787 | 69 | 50-75% Grass cover, Fair, HSG B |
| 1,164 | 85 | Gravel roads, HSG B |
| 4,951 | 73 | Weighted Average |
| 4,951 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 31S: PC-25

Runoff = 2.68 cfs @ 11.96 hrs, Volume= 0.115 af, Depth> 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 15,825 | 69 | 50-75% Grass cover, Fair, HSG B |
| 2,652 | 85 | Gravel roads, HSG B |
| 18,477 | 71 | Weighted Average |
| 18,477 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 32S: PC-24

Runoff = 1.85 cfs @ 11.96 hrs, Volume= 0.080 af, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 9,862 | 69 | 50-75% Grass cover, Fair, HSG B |
| 2,592 | 85 | Gravel roads, HSG B |
| 12,454 | 72 | Weighted Average |
| 12,454 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 33S: PC-23

Runoff = 2.41 cfs @ 11.96 hrs, Volume= 0.103 af, Depth> 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 14,066 | 69 | 50-75% Grass cover, Fair, HSG B |
| 2,593 | 85 | Gravel roads, HSG B |
| 16,659 | 71 | Weighted Average |
| 16,659 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 34S: PC-22

Runoff = 0.25 cfs @ 11.96 hrs, Volume= 0.011 af, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 1,850 | 69 | 50-75% Grass cover, Fair, HSG B |
| 1,850 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 35S: PC-21

Runoff = 0.92 cfs @ 11.96 hrs, Volume= 0.039 af, Depth> 3.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 5,974 | 69 | 50-75% Grass cover, Fair, HSG B |
| 576 | 85 | Gravel roads, HSG B |
| 6,550 | 70 | Weighted Average |
| 6,550 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------------|
| 5.0 | | | | | Direct Entry, |

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Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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Subcatchment 36S: DB

Runoff = 1.66 cfs @ 11.96 hrs, Volume= 0.071 af, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 12,132 | 69 | 50-75% Grass cover, Fair, HSG B |
| 12,132 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 50S: RC-1

Runoff = 18.58 cfs @ 11.96 hrs, Volume= 0.784 af, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 134,620 | 69 | 50-75% Grass cover, Fair, HSG B |
| 134,620 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|-----------------------|
| 4.8 | 283 | 0.1100 | 0.99 | | Lag/CN Method, |

Subcatchment 51S: RC-2

Runoff = 12.16 cfs @ 12.04 hrs, Volume= 0.651 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 111,957 | 69 | 50-75% Grass cover, Fair, HSG B |
| 111,957 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|-----------------------|
| 11.8 | 638 | 0.0660 | 0.90 | | Lag/CN Method, |

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Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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Subcatchment 53S: RC-3

Runoff = 11.08 cfs @ 11.96 hrs, Volume= 0.472 af, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 81,006 | 69 | 50-75% Grass cover, Fair, HSG B |
| 81,006 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 54S: RC-4

Runoff = 5.54 cfs @ 11.96 hrs, Volume= 0.236 af, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 40,485 | 69 | 50-75% Grass cover, Fair, HSG B |
| 40,485 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------------|
| 5.0 | | | | | Direct Entry, |

Subcatchment 55S: RC-5

Runoff = 10.04 cfs @ 11.96 hrs, Volume= 0.428 af, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 73,450 | 69 | 50-75% Grass cover, Fair, HSG B |
| 73,450 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------------|
| 5.0 | | | | | Direct Entry, |

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Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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Subcatchment 56S: RC-6

Runoff = 31.30 cfs @ 11.97 hrs, Volume= 1.376 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 236,187 | 69 | 50-75% Grass cover, Fair, HSG B |
| 236,187 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------|
| 5.7 | 332 | 0.0990 | 0.97 | | Lag/CN Method, |

Subcatchment 57S: RC-7

Runoff = 32.16 cfs @ 12.02 hrs, Volume= 1.618 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 278,196 | 69 | 50-75% Grass cover, Fair, HSG B |
| 278,196 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------|
| 9.9 | 537 | 0.0720 | 0.91 | | Lag/CN Method, |

Subcatchment 58S: RC-8

Runoff = 11.19 cfs @ 12.04 hrs, Volume= 0.606 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|---------------------------------|
| 104,346 | 69 | 50-75% Grass cover, Fair, HSG B |
| 104,346 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------|
| 12.2 | 404 | 0.0300 | 0.55 | | Lag/CN Method, |

Subcatchment 302S: Final Cover Diversion (Max Flow)

Runoff = 7.84 cfs @ 11.95 hrs, Volume= 0.347 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-yr/24-hr Rainfall=6.75"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| 44,690 | 79 | <50% Grass cover, Poor, HSG B |
| 44,690 | | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|----------------------|
| 5.0 | | | | | Direct Entry, |

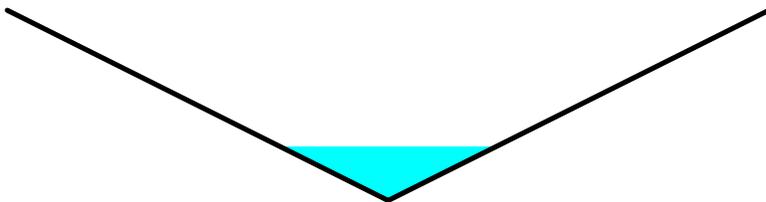
Reach 37R: DC-1

Inflow Area = 0.599 ac, Inflow Depth > 3.24" for 25-yr/24-hr event
Inflow = 3.78 cfs @ 11.96 hrs, Volume= 0.162 af
Outflow = 3.60 cfs @ 11.98 hrs, Volume= 0.162 af, Atten= 5%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.64 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.20 fps, Avg. Travel Time= 2.1 min

Peak Storage= 179 cf @ 11.97 hrs, Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 104.79 cfs

0.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
Side Slope Z-value= 2.0 ' Top Width= 8.00'
Length= 275.0' Slope= 0.0436 '
Inlet Invert= 780.00', Outlet Invert= 768.00'



Reach 38R: C-11

Inflow Area = 0.599 ac, Inflow Depth > 3.24" for 25-yr/24-hr event
Inflow = 3.60 cfs @ 11.98 hrs, Volume= 0.162 af
Outflow = 3.59 cfs @ 11.98 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.84 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.92 fps, Avg. Travel Time= 0.3 min

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Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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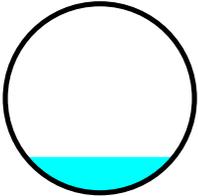
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Peak Storage= 19 cf @ 11.98 hrs, Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 2.00', Capacity at Bank-Full= 47.26 cfs

24.0" Diameter Pipe, n= 0.022 Earth, clean & straight
Length= 48.0' Slope= 0.1250 '/'
Inlet Invert= 768.00', Outlet Invert= 762.00'



Reach 39R: PC-11

Inflow Area = 2.848 ac, Inflow Depth > 3.13" for 25-yr/24-hr event
Inflow = 17.01 cfs @ 11.96 hrs, Volume= 0.742 af
Outflow = 15.93 cfs @ 12.00 hrs, Volume= 0.740 af, Atten= 6%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.54 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 4.8 min

Peak Storage= 1,372 cf @ 11.98 hrs, Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 213.85 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 293.0' Slope= 0.0137 '/'
Inlet Invert= 762.00', Outlet Invert= 758.00'



Reach 40R: PC-12

Inflow Area = 5.635 ac, Inflow Depth > 3.09" for 25-yr/24-hr event
Inflow = 28.68 cfs @ 12.01 hrs, Volume= 1.453 af
Outflow = 27.77 cfs @ 12.04 hrs, Volume= 1.450 af, Atten= 3%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.74 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 2.7 min

Peak Storage= 1,381 cf @ 12.02 hrs, Average Depth at Peak Storage= 1.19'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 186.49 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 183.0' Slope= 0.0104 '/'
Inlet Invert= 758.10', Outlet Invert= 756.20'



Reach 41R: PC-13

Inflow Area = 6.136 ac, Inflow Depth > 3.12" for 25-yr/24-hr event
Inflow = 29.82 cfs @ 12.02 hrs, Volume= 1.594 af
Outflow = 28.46 cfs @ 12.08 hrs, Volume= 1.588 af, Atten= 5%, Lag= 3.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.80 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.17 fps, Avg. Travel Time= 5.7 min

Peak Storage= 3,117 cf @ 12.05 hrs, Average Depth at Peak Storage= 1.20'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 186.62 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 404.0' Slope= 0.0104 '/'
Inlet Invert= 756.40', Outlet Invert= 752.20'



Reach 42R: PC-14

Inflow Area = 9.891 ac, Inflow Depth > 3.11" for 25-yr/24-hr event
Inflow = 42.60 cfs @ 12.00 hrs, Volume= 2.563 af
Outflow = 40.83 cfs @ 12.07 hrs, Volume= 2.553 af, Atten= 4%, Lag= 4.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.20 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 7.0 min

Peak Storage= 5,646 cf @ 12.03 hrs, Average Depth at Peak Storage= 1.42'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 189.23 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 580.0' Slope= 0.0107 '/'
Inlet Invert= 752.20', Outlet Invert= 746.00'



Reach 43R: PC-15

Inflow Area = 10.359 ac, Inflow Depth > 3.11" for 25-yr/24-hr event
Inflow = 42.05 cfs @ 12.06 hrs, Volume= 2.687 af
Outflow = 41.10 cfs @ 12.09 hrs, Volume= 2.682 af, Atten= 2%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.32 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.36 fps, Avg. Travel Time= 2.9 min

Peak Storage= 2,303 cf @ 12.07 hrs, Average Depth at Peak Storage= 0.96'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 407.23 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 404.0' Slope= 0.0495 '/'
Inlet Invert= 746.00', Outlet Invert= 726.00'



Reach 44R: PC-16

Inflow Area = 13.132 ac, Inflow Depth > 3.10" for 25-yr/24-hr event
Inflow = 52.50 cfs @ 12.07 hrs, Volume= 3.397 af
Outflow = 51.65 cfs @ 12.09 hrs, Volume= 3.392 af, Atten= 2%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.10 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.33 fps, Avg. Travel Time= 2.2 min

Peak Storage= 2,223 cf @ 12.08 hrs, Average Depth at Peak Storage= 1.16'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 356.57 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 303.0' Slope= 0.0380 '/'
Inlet Invert= 726.00', Outlet Invert= 714.50'



Reach 45R: PC-17

Inflow Area = 14.041 ac, Inflow Depth > 3.12" for 25-yr/24-hr event
Inflow = 53.22 cfs @ 12.08 hrs, Volume= 3.645 af
Outflow = 51.93 cfs @ 12.15 hrs, Volume= 3.631 af, Atten= 2%, Lag= 3.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.77 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 6.1 min

Peak Storage= 6,609 cf @ 12.11 hrs, Average Depth at Peak Storage= 1.55'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 204.63 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 600.0' Slope= 0.0125 '/'
Inlet Invert= 714.50', Outlet Invert= 707.00'



Reach 46R: PC-18

Inflow Area = 20.487 ac, Inflow Depth > 3.08" for 25-yr/24-hr event
Inflow = 73.44 cfs @ 12.07 hrs, Volume= 5.266 af
Outflow = 72.65 cfs @ 12.08 hrs, Volume= 5.265 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.20 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.86 fps, Avg. Travel Time= 0.4 min

Chambers 4-11-24

Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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Peak Storage= 676 cf @ 12.07 hrs, Average Depth at Peak Storage= 1.84'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 204.63 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 48.0' Slope= 0.0125 '/'
Inlet Invert= 707.00', Outlet Invert= 706.40'



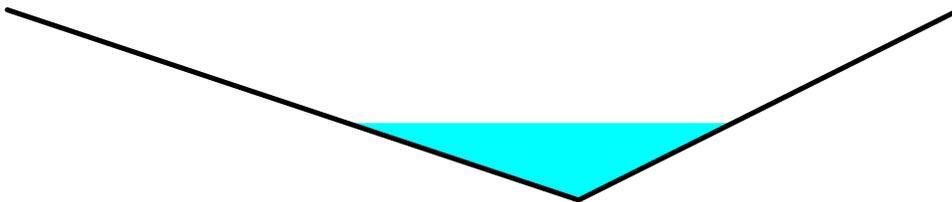
Reach 47R: DB

| | | | |
|---------------|-----------------------|----------------------|------------------------------------|
| Inflow Area = | 0.279 ac, | Inflow Depth > 3.05" | for 25-yr/24-hr event |
| Inflow = | 1.66 cfs @ 11.96 hrs, | Volume= | 0.071 af |
| Outflow = | 1.50 cfs @ 12.03 hrs, | Volume= | 0.070 af, Atten= 10%, Lag= 4.1 min |

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.69 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 5.8 min

Peak Storage= 214 cf @ 11.99 hrs, Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 17.39 cfs

0.00' x 1.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 3.0 2.0 '/' Top Width= 7.50'
Length= 232.0' Slope= 0.0086 '/'
Inlet Invert= 765.00', Outlet Invert= 763.00'



Reach 48R: PC-21

| | | | |
|---------------|-----------------------|----------------------|-----------------------------------|
| Inflow Area = | 0.429 ac, | Inflow Depth > 3.07" | for 25-yr/24-hr event |
| Inflow = | 2.25 cfs @ 11.99 hrs, | Volume= | 0.110 af |
| Outflow = | 2.24 cfs @ 12.00 hrs, | Volume= | 0.110 af, Atten= 1%, Lag= 0.3 min |

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.83 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.51 fps, Avg. Travel Time= 0.5 min

Chambers 4-11-24

Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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Peak Storage= 28 cf @ 12.00 hrs, Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 647.10 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 48.0' Slope= 0.1250 '/'
Inlet Invert= 762.00', Outlet Invert= 756.00'



Reach 49R: PC-22

| | | | |
|---------------|-----------------------|----------------------|-----------------------------------|
| Inflow Area = | 1.401 ac, | Inflow Depth > 3.05" | for 25-yr/24-hr event |
| Inflow = | 7.84 cfs @ 11.97 hrs, | Volume= | 0.356 af |
| Outflow = | 7.74 cfs @ 11.98 hrs, | Volume= | 0.356 af, Atten= 1%, Lag= 0.6 min |

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.26 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 1.0 min

Peak Storage= 127 cf @ 11.97 hrs, Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 397.39 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 70.0' Slope= 0.0471 '/'
Inlet Invert= 756.00', Outlet Invert= 752.70'



Reach 50R: PC-23

| | | | |
|---------------|------------------------|----------------------|-----------------------------------|
| Inflow Area = | 1.783 ac, | Inflow Depth > 3.09" | for 25-yr/24-hr event |
| Inflow = | 10.06 cfs @ 11.97 hrs, | Volume= | 0.460 af |
| Outflow = | 9.85 cfs @ 11.99 hrs, | Volume= | 0.459 af, Atten= 2%, Lag= 1.0 min |

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.14 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.76 fps, Avg. Travel Time= 2.0 min

Chambers 4-11-24

Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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Peak Storage= 352 cf @ 11.98 hrs, Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 604.98 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 216.0' Slope= 0.1093 '/'
Inlet Invert= 752.70', Outlet Invert= 729.10'



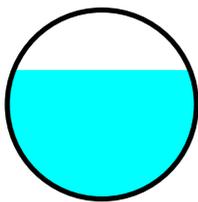
Reach 51R: C-21

Inflow Area = 3.469 ac, Inflow Depth > 3.07" for 25-yr/24-hr event
Inflow = 19.48 cfs @ 11.97 hrs, Volume= 0.887 af
Outflow = 19.41 cfs @ 11.98 hrs, Volume= 0.887 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.45 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 0.5 min

Peak Storage= 214 cf @ 11.98 hrs, Average Depth at Peak Storage= 1.70'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 24.24 cfs

30.0" Diameter Pipe, n= 0.022 Earth, clean & straight
Length= 60.0' Slope= 0.0100 '/'
Inlet Invert= 729.10', Outlet Invert= 728.50'



Reach 52R: PC-24

Inflow Area = 3.755 ac, Inflow Depth > 3.09" for 25-yr/24-hr event
Inflow = 21.20 cfs @ 11.98 hrs, Volume= 0.966 af
Outflow = 20.81 cfs @ 11.99 hrs, Volume= 0.965 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.84 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.21 fps, Avg. Travel Time= 1.6 min

Chambers 4-11-24

Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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Peak Storage= 581 cf @ 11.98 hrs, Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 604.98 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 216.0' Slope= 0.1093 '/'
Inlet Invert= 752.70', Outlet Invert= 729.10'



Reach 53R: PC-25

| | | | |
|---------------|------------------------|----------------------|-----------------------------------|
| Inflow Area = | 4.179 ac, | Inflow Depth > 3.10" | for 25-yr/24-hr event |
| Inflow = | 23.31 cfs @ 11.98 hrs, | Volume= | 1.080 af |
| Outflow = | 22.84 cfs @ 12.00 hrs, | Volume= | 1.079 af, Atten= 2%, Lag= 0.7 min |

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.00 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.26 fps, Avg. Travel Time= 1.6 min

Peak Storage= 642 cf @ 11.99 hrs, Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 593.01 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 221.0' Slope= 0.1050 '/'
Inlet Invert= 729.10', Outlet Invert= 705.90'



Reach 54R: PC-26

| | | | |
|---------------|------------------------|----------------------|-----------------------------------|
| Inflow Area = | 9.715 ac, | Inflow Depth > 3.07" | for 25-yr/24-hr event |
| Inflow = | 54.41 cfs @ 11.98 hrs, | Volume= | 2.487 af |
| Outflow = | 53.66 cfs @ 11.99 hrs, | Volume= | 2.485 af, Atten= 1%, Lag= 0.5 min |

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.78 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.45 fps, Avg. Travel Time= 1.1 min

Peak Storage= 1,101 cf @ 11.98 hrs, Average Depth at Peak Storage= 1.59'
Bank-Full Depth= 3.00', Capacity at Bank-Full= 203.57 cfs

4.00' x 3.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 2.0 '/' Top Width= 16.00'
Length= 97.0' Slope= 0.0124 '/'
Inlet Invert= 705.90', Outlet Invert= 704.70'



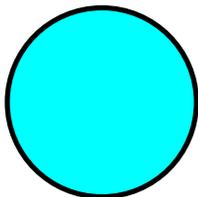
Reach 55R: C-12

Inflow Area = 20.754 ac, Inflow Depth > 3.09" for 25-yr/24-hr event
Inflow = 73.77 cfs @ 12.07 hrs, Volume= 5.337 af
Outflow = 63.77 cfs @ 12.02 hrs, Volume= 5.336 af, Atten= 14%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.80 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.91 fps, Avg. Travel Time= 0.2 min

Peak Storage= 393 cf @ 12.05 hrs, Average Depth at Peak Storage= 2.50'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 59.37 cfs

A factor of 2.00 has been applied to the storage and discharge capacity
30.0" Diameter Pipe, n= 0.022 Earth, clean & straight
Length= 40.0' Slope= 0.0150 '/'
Inlet Invert= 706.00', Outlet Invert= 705.40'



Reach 56R: C-22

Inflow Area = 10.028 ac, Inflow Depth > 3.08" for 25-yr/24-hr event
Inflow = 55.50 cfs @ 11.99 hrs, Volume= 2.570 af
Outflow = 55.26 cfs @ 11.99 hrs, Volume= 2.569 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.87 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.38 fps, Avg. Travel Time= 0.3 min

Chambers 4-11-24

Type II 24-hr 25-yr/24-hr Rainfall=6.75"

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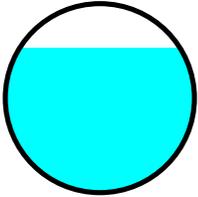
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Peak Storage= 323 cf @ 11.99 hrs, Average Depth at Peak Storage= 1.91'
Bank-Full Depth= 2.50', Capacity at Bank-Full= 59.37 cfs

A factor of 2.00 has been applied to the storage and discharge capacity
30.0" Diameter Pipe, n= 0.022 Earth, clean & straight
Length= 40.0' Slope= 0.0150 '/'
Inlet Invert= 704.70', Outlet Invert= 704.10'



Pond 9P: Sed Pond SP-3

Inflow Area = 30.782 ac, Inflow Depth > 3.08" for 25-yr/24-hr event
 Inflow = 117.71 cfs @ 12.00 hrs, Volume= 7.906 af
 Outflow = 5.34 cfs @ 14.85 hrs, Volume= 2.272 af, Atten= 95%, Lag= 170.7 min
 Primary = 5.34 cfs @ 14.85 hrs, Volume= 2.272 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Starting Elev= 696.00' Surf.Area= 4,239 sf Storage= 22,364 cf
 Peak Elev= 701.74' @ 14.85 hrs Surf.Area= 58,349 sf Storage= 274,129 cf (251,765 cf above start)

Plug-Flow detention time= 316.7 min calculated for 1.758 af (22% of inflow)
 Center-of-Mass det. time= 167.2 min (963.7 - 796.5)

| Volume #1 | Invert 692.00' | Avail.Storage 413,417 cf | Storage Description |
|--|-------------------|--------------------------|------------------------|
| Custom Stage Data (Prismatic) Listed below (Recalc) | | | |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 692.00 | 985 | 0 | 0 |
| 694.00 | 8,570 | 9,555 | 9,555 |
| 696.00 | 4,239 | 12,809 | 22,364 |
| 698.00 | 48,262 | 52,501 | 74,865 |
| 700.00 | 53,654 | 101,916 | 176,781 |
| 702.00 | 59,056 | 112,710 | 289,491 |
| 704.00 | 64,870 | 123,926 | 413,417 |

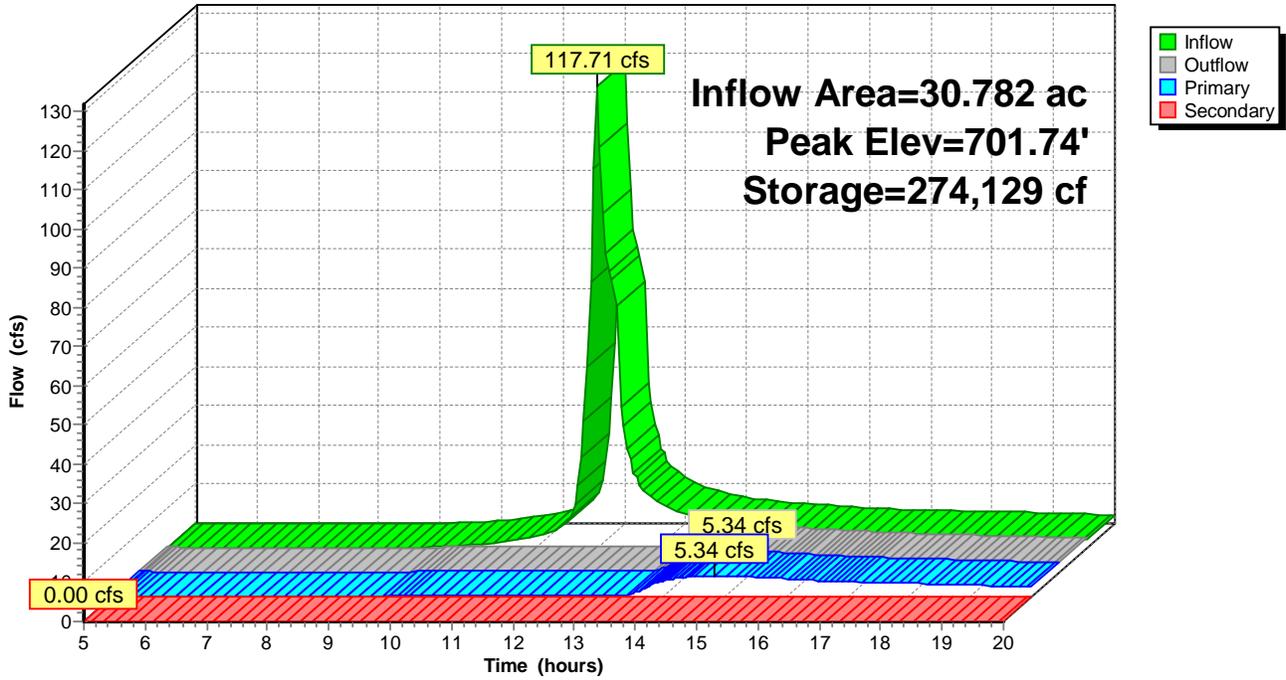
| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|---|
| #1 | Primary | 692.00' | 24.0" x 104.0' long Culvert RCP, groove end projecting, Ke= 0.200 Outlet Invert= 690.96' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections |
| #2 | Device 1 | 692.00' | Special & User-Defined Head (feet) 0.00 1.00 2.00 3.90 4.00 6.00 7.00 8.00 10.00 15.00 Disch. (cfs) 0.000 0.000 0.000 0.000 0.500 0.500 0.500 0.500 0.500 0.500 |
| #3 | Device 1 | 701.50' | 48.0" Horiz. Orifice/Grate Limited to weir flow C= 0.600 |
| #4 | Secondary | 702.50' | 30.0' long x 19.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63 |

Primary OutFlow Max=5.28 cfs @ 14.85 hrs HW=701.74' (Free Discharge)
 ↑ **1=Culvert** (Passes 5.28 cfs of 47.28 cfs potential flow)
 ↑ **2=Special & User-Defined** (Custom Controls 0.50 cfs)
 ↑ **3=Orifice/Grate** (Weir Controls 4.78 cfs @ 1.60 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=696.00' (Free Discharge)
 ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 9P: Sed Pond SP-3

Hydrograph



Chambers 4-11-24

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Pond 9P: Sed Pond SP-3

Inflow Area = 30.782 ac, Inflow Depth > 2.34" for 10-yr/24-hr event
 Inflow = 87.90 cfs @ 12.02 hrs, Volume= 5.998 af
 Outflow = 1.29 cfs @ 20.00 hrs, Volume= 0.455 af, Atten= 99%, Lag= 478.7 min
 Primary = 1.29 cfs @ 20.00 hrs, Volume= 0.455 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Starting Elev= 696.00' Surf.Area= 4,239 sf Storage= 22,364 cf
 Peak Elev= 701.56' @ 20.00 hrs Surf.Area= 57,870 sf Storage= 263,811 cf (241,447 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= 111.1 min (913.6 - 802.5)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 692.00' | 413,417 cf | Custom Stage Data (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|------------------|-------------------|------------------------|------------------------|
| 692.00 | 985 | 0 | 0 |
| 694.00 | 8,570 | 9,555 | 9,555 |
| 696.00 | 4,239 | 12,809 | 22,364 |
| 698.00 | 48,262 | 52,501 | 74,865 |
| 700.00 | 53,654 | 101,916 | 176,781 |
| 702.00 | 59,056 | 112,710 | 289,491 |
| 704.00 | 64,870 | 123,926 | 413,417 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|---|
| #1 | Primary | 692.00' | 24.0" x 104.0' long Culvert RCP, groove end projecting, Ke= 0.200 Outlet Invert= 690.96' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections |
| #2 | Device 1 | 692.00' | Special & User-Defined Head (feet) 0.00 1.00 2.00 3.90 4.00 6.00 7.00 8.00 10.00 15.00 Disch. (cfs) 0.000 0.000 0.000 0.000 0.500 0.500 0.500 0.500 0.500 0.500 |
| #3 | Device 1 | 701.50' | 48.0" Horiz. Orifice/Grate Limited to weir flow C= 0.600 |
| #4 | Secondary | 702.50' | 30.0' long x 19.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63 |

Primary OutFlow Max=1.12 cfs @ 20.00 hrs HW=701.56' (Free Discharge)

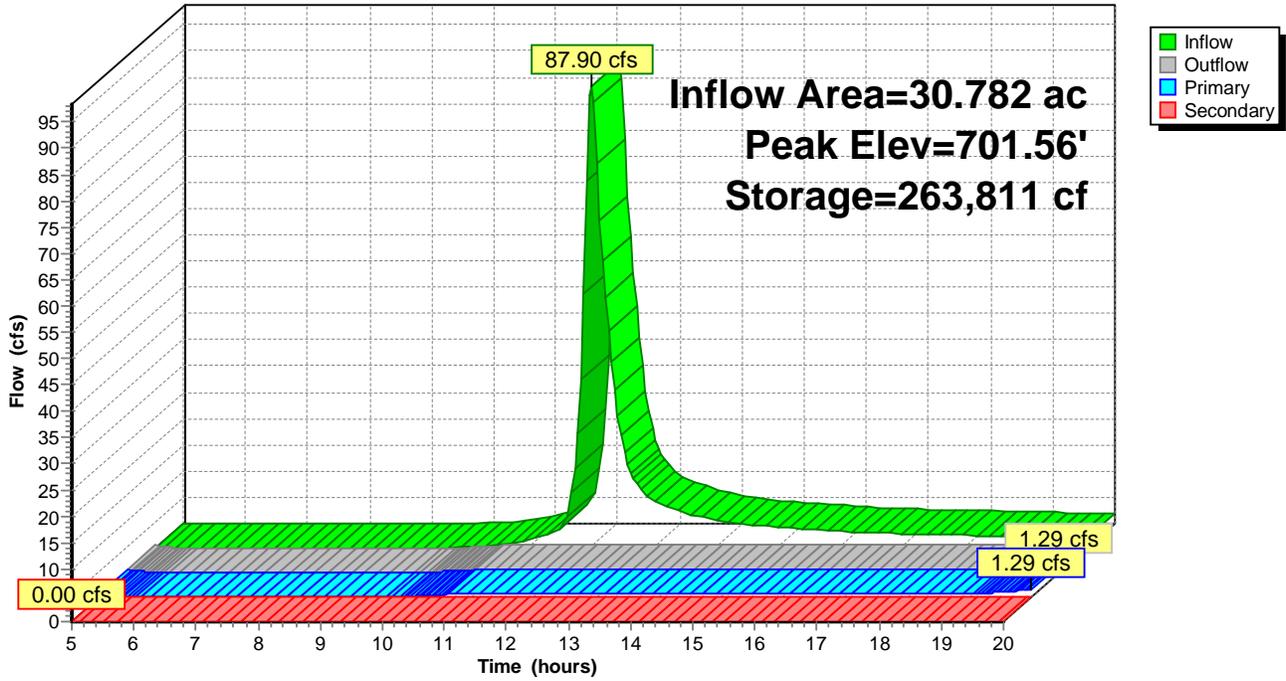
- ↑ 1=Culvert (Passes 1.12 cfs of 46.80 cfs potential flow)
- ↑ 2=Special & User-Defined (Custom Controls 0.50 cfs)
- ↑ 3=Orifice/Grate (Weir Controls 0.62 cfs @ 0.81 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=696.00' (Free Discharge)

- ↑ 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 9P: Sed Pond SP-3

Hydrograph



Chambers 4-11-24

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Pond 9P: Sed Pond SP-3

Inflow Area = 30.782 ac, Inflow Depth > 4.29" for 100-yr/24-hr event
 Inflow = 118.81 cfs @ 12.03 hrs, Volume= 11.016 af
 Outflow = 30.11 cfs @ 12.69 hrs, Volume= 5.342 af, Atten= 75%, Lag= 40.1 min
 Primary = 30.11 cfs @ 12.69 hrs, Volume= 5.342 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Starting Elev= 696.00' Surf.Area= 4,239 sf Storage= 22,364 cf
 Peak Elev= 702.30' @ 12.69 hrs Surf.Area= 59,934 sf Storage= 307,467 cf (285,103 cf above start)

Plug-Flow detention time= 198.1 min calculated for 4.813 af (44% of inflow)
 Center-of-Mass det. time= 95.8 min (886.5 - 790.6)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|---------|---------------|--|
| #1 | 692.00' | 413,417 cf | Custom Stage Data (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|------------------|-------------------|------------------------|------------------------|
| 692.00 | 985 | 0 | 0 |
| 694.00 | 8,570 | 9,555 | 9,555 |
| 696.00 | 4,239 | 12,809 | 22,364 |
| 698.00 | 48,262 | 52,501 | 74,865 |
| 700.00 | 53,654 | 101,916 | 176,781 |
| 702.00 | 59,056 | 112,710 | 289,491 |
| 704.00 | 64,870 | 123,926 | 413,417 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|---------|---|
| #1 | Primary | 692.00' | 24.0" x 104.0' long Culvert RCP, groove end projecting, Ke= 0.200 Outlet Invert= 690.96' S= 0.0100 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections |
| #2 | Device 1 | 692.00' | Special & User-Defined Head (feet) 0.00 1.00 2.00 3.90 4.00 6.00 7.00 8.00 10.00 15.00 Disch. (cfs) 0.000 0.000 0.000 0.000 0.500 0.500 0.500 0.500 0.500 0.500 |
| #3 | Device 1 | 701.50' | 48.0" Horiz. Orifice/Grate Limited to weir flow C= 0.600 |
| #4 | Secondary | 702.50' | 30.0' long x 19.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63 |

Primary OutFlow Max=29.88 cfs @ 12.69 hrs HW=702.30' (Free Discharge)

- ↑ 1=Culvert (Passes 29.88 cfs of 48.77 cfs potential flow)
- ↑ 2=Special & User-Defined (Custom Controls 0.50 cfs)
- ↑ 3=Orifice/Grate (Weir Controls 29.38 cfs @ 2.92 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=696.00' (Free Discharge)

- ↑ 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

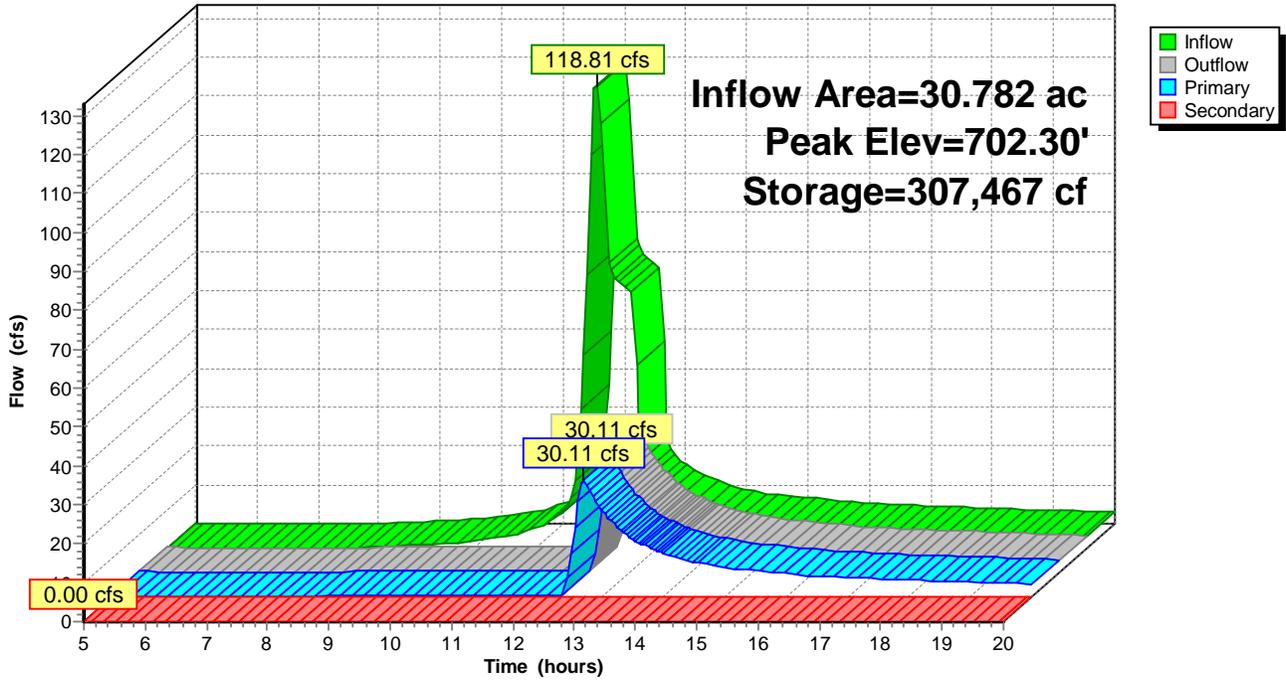
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Pond 9P: Sed Pond SP-3

Hydrograph



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|--|--|--------------|--|
| | ADDRESS | TEL | WEB |
| | 14 N. Boylan Avenue, Raleigh, NC 27603 | 919.828.0577 | www.smithgardnerinc.com |

| | | | | | | | |
|---------|----------------------------------|-------|----------------------|----|-----------|-------------|-----------------------|
| PROJECT | <u>Chambers County Landfill</u> | SHEET | <u>1</u> | OF | <u>22</u> | DATE | <u>4/12/2024</u> |
| SUBJECT | <u>Drainage Channel Analysis</u> | JOB # | <u>CHAMBERS-24-1</u> | | | COMPUTED BY | <u>Megan Skvoretz</u> |
| | | | | | | CHECKED BY | <u>Greg Mills</u> |

OBJECTIVE: To design drainage channels, ditches, etc. to handle stormwater flow from the design storm(s). The main design criteria will be to ensure that all drainage channels, ditches, etc. will be able to accommodate the peak discharge from the design storm without overtopping and without exceeding the allowable shear stress and/or velocity of the selected channel lining.

REFERENCES: Federal Highway Administration (2001), Urban Drainage Design Manual, Hydraulic Engineering Circular No. 22, FHWA NHI-01-021, Second Ed., U.S. Dept. of Transportation, Washington, D.C.

Alabama Soil and Water Conservation Committee (2022), "Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas", July 2022.

Malcom, H. Rooney (1989 & 2003 Supplement), Elements of Urban Stormwater Design, NC State Univ., Raleigh, NC.

ANALYSIS: The following approach is used in the design of drainage channels:

1. Determine the peak discharge from the design storm(s) (from HydroCAD or spreadsheet methods). For permanent linings (Grass, TRM, rip rap, gabions, etc.) use the peak discharge from the 25-Yr 24-Hr storm unless otherwise specified. For grass lined channels, a smaller design storm (2-Yr 24-Hr - unless otherwise specified) is used to evaluate temporary linings.
2. Input other design parameters (bottom width; side slopes; minimum freeboard, min./max. slopes; and channel lining).
3. Based on the design parameters calculate normal depth of flow, velocity, Froude number, and maximum shear stress for both max./min. slopes. Also determine the critical slope and corresponding normal depth.
4. Compare the velocity and/or shear stress to allowable values (the maximum slope values will control). If values are exceeded, revise design parameters as required.
5. Based on normal depth values and required freeboard (generally use the greater of 6 inches or 25% of the flow depth), determine the minimum channel depth and top width for both max./min. slopes (the minimum slope values will control).
6. If the channel has a significant curved reach, evaluate the shear stress and superelevation of the water surface in the bend.

CALCULATIONS:

- Manning's Equation:

(HEC-22 Eq. 5-5)

where:

| | | |
|-----|---|---|
| Q | = | discharge (cfs) |
| n | = | Manning's roughness coefficient (See Below) |
| A | = | cross sectional area of flow (ft ²) |
| R | = | hydraulic radius (ft) = A/P |
| P | = | wetted perimeter |
| S | = | slope of channel (ft/ft) |
| V | = | average channel velocity (ft/sec) |

- Maximum Shear Stress (Tractive Force Method):

(HEC-22 Eq. 5-13)

where: τ_o = maximum shear stress on channel lining (psf)
 γ = unit weight of water (62.4 pcf)
 d = maximum depth of flow (ft)
 S = channel slope (ft/ft)

- Froude Number:

where: F_r = Froude number (dimensionless)
 v = flow velocity (ft/sec)
 g = acceleration of gravity (32.2 ft/sec²)
 A = cross-sectional area of flow (ft²)
 T = top width of flow (ft)

Note that A/T = the hydraulic depth (D). For $F_r > 1.0$, flow is supercritical; $F_r < 1.0$, flow is subcritical; $F_r = 1.0$, flow is critical.

Critical Slope:

The critical slope (S_c) is the slope at which $F_r = 1.0$. When the slope is between $0.7S_c$ and $1.3S_c$, unstable flow may occur as small flow disturbances can initiate a change in the flow state. If slopes are within this range, consider additional freeboard.

- Manning's Roughness Coefficient (n):Grass:

(HEC-22 Eq. 5-6 - 5-10)

where: R = hydraulic radius (ft)
 K = vegetative coefficient (depending on retardance class)
= 15.8 (Class A)
= 23.0 (Class B)
= 30.2 (Class C)
= 34.6 (Class D)
= 37.7 (Class E)
 S = slope of channel (ft/ft)

Rip Rap:

(PA DEP Manual Fig. 3)

where: y = depth of flow (ft)
 d_{50} = median size of rip rap (ft)

PROJECT Chambers County Landfill

SHEET 3 OF 22

DATE 4/12/2024

SUBJECT Drainage Channel Analysis

JOB # CHAMBERS-24-1

COMPUTED BY Megan Skvoretz

CHECKED BY Greg Mills

- Curved Channels (Where Applicable):

Shear Stress in Bend:

(HEC-22 Eq. 5-15)

where: τ_d = bend shear stress (psf)
 K_b = function of R_c/B (use HEC-22 Chart 21)
 τ_d = maximum shear stress on channel lining (psf)
 R_c = radius to the centerline of the channel (ft)
 B = bottom width of channel (ft)

Superelevation at Outside of Bend:

(HEC-22 Eq. 5-11 modified)

where: Δd = superelevation of water surface between the outer channel bank and the centerline of the channel (avg. water surface before bend) (ft)
 V = average channel velocity (ft/sec)
 T = top width of flow (ft)
 g = acceleration of gravity (32.2 ft/sec²)
 R_c = radius to the centerline of the channel (ft)

- Allowable Shear Stress/Velocity:

Grass-Lined Channels:

For grass-lined channels, an allowable velocity approach is applicable for slopes flatter than 10%. For slopes of 10% and steeper appropriate permanent linings should be used. For use in the evaluation of curved channels, the following allowable shear stress values (lb/ft²) can be assumed based on retardance class:

Class A: 3.7
Class B: 2.1
Class C: 1
Class D: 0.6
Class E: 0.35

Rip Rap-Lined Channels:

For rip rap-lined channels, an allowable velocity approach is applicable for slopes flatter than 10% (see table below). For slopes of 10% or steeper, use the following equation:

(HEC-22 Eq. 5-17)

where: τ_{allow} = allowable shear stress (psf)
 d_{50} = median size of rip rap (ft)

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. Final Cover Diversion Berm

SHEET 4 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

Longest area draining to a Final Cover Diversion

PEAK DISCHARGE, Q_{25} = 7.8 ft³/s Source: HydroCAD 25-Yr 24-Hr poor vegetation

Bottom Width, B = 0.0 ft
 Left Side Slope, z_1 = 1.5 horizontal : 1 vertical
 Right Side Slope, z_2 = 3.0 horizontal : 1 vertical

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D
 K = 34.6
 TRM Product Name = Propex - Landlok TRM 435, or equal
 τ_{allow} = 5.0 lb/ft²

Minimum Freeboard = 0.5000 ft

Maximum Channel Slope, S_{max} = 0.050 ft/ft

Minimum Channel Slope, S_{min} = 0.010 ft/ft

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) # | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|---|-------------------------------------|--|-------------|
| Y_n ft | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 1.02 | 0.059 | 2.34 | 5.06 | 0.46 | 4.59 | 0.51 | 3.35 | 7.8 | 0.83 | 3.2 | 1.6 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| 1.46 | 0.069 | 4.80 | 7.25 | 0.66 | 6.57 | 0.73 | 1.64 | 7.9 | 0.34 | 0.9 | 5.5 | O.K. |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) # | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|---|---|--|
| Y_c ft | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | | ft/ft | |
| 0.95 | 0.058 | 2.03 | 4.72 | 0.43 | 4.28 | 0.48 | 1.40 | 7.9 | 3.91 | 1.00 | 0.070 | Slopes Near S_c - Check Freeboard. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Minimum Channel Depth ft | Minimum Top Width T ft | Minimum Channel Depth ft | Minimum Top Width T ft | |
| 1.52 | 6.84 | 1.96 | 8.82 | |

PROJECT Chambers County Landfill
 SUBJECT Drainage Channel Analysis (Grass Lined)
 Channel No. DC-1 (existing)

SHEET 5 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY GGM
 CHECKED BY JCL

Design Parameters:

PEAK DISCHARGE, $Q_2 = 1.58$ ft³/s Source: HydroCAD 2-Yr 24-Hr
 PEAK DISCHARGE, $Q_{25} = 3.8$ ft³/s Source: HydroCAD 25-Yr 24-Hr

Bottom Width, $B = 0.0$ ft
 Left Side Slope, $Z_1 = 2.0$ horizontal : 1 vertical
 Right Side Slope, $Z_2 = 2.0$ horizontal : 1 vertical

Minimum Freeboard = 0.5 ft

Maximum Channel Slope, $S_{max} = 0.050$ ft/ft
 Minimum Channel Slope, $S_{min} = 0.014$ ft/ft

Permanent Grass Lining:

Grass Retardance = D
 $K = 34.6$
 $V_{allow} = 4.5$ ft/sec
 $\tau_{allow} = 0.60$ lb/ft²

Temporary Lining:

Temporary Lining Used (Y/N) = Y
 RECP Product Name = NA Green - Curlex I, or equal
 Manning's Coefficient, $n = 0.035$
 $\tau_{allow} = 1.55$ lb/ft²

Bare Ground (If Temporary Liner Not Used):

Manning's Coefficient, $n = 0.020$
 $V_{allow} = 2.0$ ft/sec

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow | Wetted Perimeter | Hydraulic Radius | Top Width | Hydraulic Depth | Average Velocity | Flow Rate | Froude Number | Maximum Shear Stress | Allowable Velocity (V) or Sh. Stress (S) | Factor of Safety | Comment |
|-----------------------------|---------------------------------|-----------------|------------------|------------------|-----------|-----------------|------------------|--------------------|----------------|----------------------|--|--|---------|
| Y_n | n | A | P | $R=A/P$ | T | $D=A/T$ | V_n | Q | F_r (Normal) | τ_d | Used? | V_{allow}/V_n or τ_{allow}/τ_d | |
| ft | | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | # | lb/ft ² | | | |

Q2

| | | | | | | | | | | | | | | |
|----------------|-------------|-------|------|------|------|------|------|------|-----|------|------------|---|-----|-------------|
| Maximum Slope: | 0.48 | 0.035 | 0.46 | 2.15 | 0.21 | 1.92 | 0.24 | 3.41 | 1.6 | 1.23 | 1.5 | S | 1.0 | O.K. |
|----------------|-------------|-------|------|------|------|------|------|------|-----|------|------------|---|-----|-------------|

| | | | | | | | | | | | | | | |
|----------------|-------------|-------|------|------|------|------|------|------|-----|------|------------|---|-----|-------------|
| Minimum Slope: | 0.61 | 0.035 | 0.74 | 2.73 | 0.27 | 2.44 | 0.31 | 2.12 | 1.6 | 0.68 | 0.5 | S | 2.9 | O.K. |
|----------------|-------------|-------|------|------|------|------|------|------|-----|------|------------|---|-----|-------------|

Q25

| | | | | | | | | | | | | | | |
|----------------|-------------|-------|------|------|------|------|------|------|-----|------|------------|---|-----|-------------|
| Maximum Slope: | 0.86 | 0.068 | 1.48 | 3.85 | 0.38 | 3.44 | 0.43 | 2.59 | 3.8 | 0.70 | 2.7 | V | 1.7 | O.K. |
|----------------|-------------|-------|------|------|------|------|------|------|-----|------|------------|---|-----|-------------|

| | | | | | | | | | | | | | | |
|----------------|-------------|-------|------|------|------|------|------|------|-----|------|------------|---|-----|-------------|
| Minimum Slope: | 1.14 | 0.077 | 2.60 | 5.10 | 0.51 | 4.56 | 0.57 | 1.46 | 3.8 | 0.34 | 1.0 | V | 3.1 | O.K. |
|----------------|-------------|-------|------|------|------|------|------|------|-----|------|------------|---|-----|-------------|

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow | Wetted Perimeter | Hydraulic Radius | Top Width | Hydraulic Depth | Section Factor | Flow Rate | Average Velocity | Froude Number | Uniform-Flow Critical Slope | Comment |
|-----------------------------|---------------------------------|-----------------|------------------|------------------|-----------|-----------------|-------------------|--------------------|------------------|------------------|-----------------------------|---------|
| Y_c | n | A | P | $R=A/P$ | T | $D=A/T$ | $Z=AD^{1/2}$ | Q | V_c | F_r (Critical) | S_c | |
| ft | | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | # | ft/ft | |

Q2

| | | | | | | | | | | | | |
|-------------|-------|------|------|------|------|------|------|-----|------|------|-------|------------------------|
| 0.52 | 0.035 | 0.54 | 2.33 | 0.23 | 2.08 | 0.26 | 0.28 | 1.6 | 2.89 | 1.00 | 0.032 | Flow Is Stable. |
|-------------|-------|------|------|------|------|------|------|-----|------|------|-------|------------------------|

Q25

| | | | | | | | | | | | | |
|-------------|-------|------|------|------|------|------|------|-----|------|------|-------|------------------------|
| 0.74 | 0.064 | 1.10 | 3.31 | 0.33 | 2.96 | 0.37 | 0.67 | 3.8 | 3.45 | 1.00 | 0.097 | Flow Is Stable. |
|-------------|-------|------|------|------|------|------|------|-----|------|------|-------|------------------------|

Determination of Minimum Channel Depth & Top Width (Based on Q25)

| Maximum Slope | | Minimum Slope | | |
|-----------------------|-------------------|-----------------------|-------------------|--|
| Minimum Channel Depth | Minimum Top Width | Minimum Channel Depth | Minimum Top Width | |
| ft | T | ft | T | |
| 1.36 | 5.44 | 1.64 | 6.56 | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (Grass Lined)

Channel No. PC-11 grass

SHEET 6 of 22
 JOB # CHAMBERS-24-1
 DATE 4/13/2024
 COMPUTED BY Greg Mills
 CHECKED BY JCL

Design Parameters:

PEAK DISCHARGE, $Q_2 = 6.90$ ft³/s Source: HydroCAD 2-Yr 24-Hr
 PEAK DISCHARGE, $Q_{25} = 17.0$ ft³/s Source: HydroCAD 25-Yr 24-Hr

Bottom Width, $B = 4.0$ ft
 Left Side Slope, $Z_1 = 2.0$ horizontal : 1 vertical
 Right Side Slope, $Z_2 = 2.0$ horizontal : 1 vertical

Minimum Freeboard = 0.5 ft

Maximum Channel Slope, $S_{max} = 0.020$ ft/ft
 Minimum Channel Slope, $S_{min} = 0.014$ ft/ft

Permanent Grass Lining:

Grass Retardance = D
 $K = 34.6$
 $V_{allow} = 4.5$ ft/sec
 $\tau_{allow} = 0.60$ lb/ft²

Temporary Lining:

Temporary Lining Used (Y/N) = Y
 RECP Product Name = NA Green - Curlex I, or equal
 Manning's Coefficient, $n = 0.035$
 $\tau_{allow} = 1.55$ lb/ft²

Bare Ground (If Temporary Liner Not Used):

Manning's Coefficient, $n = 0.020$
 $V_{allow} = 2.0$ ft/sec

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow | Wetted Perimeter | Hydraulic Radius | Top Width | Hydraulic Depth | Average Velocity | Flow Rate | Froude Number | Maximum Shear Stress | Allowable Velocity (V) or Sh. Stress (S) | Factor of Safety | Comment |
|-----------------------------|---------------------------------|-----------------|------------------|------------------|-----------|-----------------|------------------|--------------------|----------------|----------------------|--|--|---------|
| Y_n | n | A | P | $R=A/P$ | T | $D=A/T$ | V_n | Q | F_r (Normal) | τ_d | Used? | V_{allow}/V_n or τ_{allow}/τ_d | |
| ft | | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | # | lb/ft ² | | | |

Q2

| | | | | | | | | | | | | | |
|----------------|-------|------|------|------|------|------|------|-----|------|------------|---|-----|-------------|
| Maximum Slope: | | | | | | | | | | | | | |
| 0.45 | 0.035 | 2.21 | 6.01 | 0.37 | 5.80 | 0.38 | 3.08 | 6.8 | 0.88 | 0.6 | S | 2.8 | O.K. |

| | | | | | | | | | | | | | |
|----------------|-------|------|------|------|------|------|------|-----|------|------------|---|-----|-------------|
| Minimum Slope: | | | | | | | | | | | | | |
| 0.50 | 0.035 | 2.50 | 6.24 | 0.40 | 6.00 | 0.42 | 2.74 | 6.8 | 0.75 | 0.4 | S | 3.5 | O.K. |

Q25

| | | | | | | | | | | | | | |
|----------------|-------|------|------|------|------|------|------|------|------|------------|---|-----|-------------|
| Maximum Slope: | | | | | | | | | | | | | |
| 0.98 | 0.057 | 5.84 | 8.38 | 0.70 | 7.92 | 0.74 | 2.92 | 17.1 | 0.60 | 1.2 | V | 1.5 | O.K. |

| | | | | | | | | | | | | | |
|----------------|-------|------|------|------|------|------|------|------|------|------------|---|-----|-------------|
| Minimum Slope: | | | | | | | | | | | | | |
| 1.09 | 0.058 | 6.74 | 8.87 | 0.76 | 8.36 | 0.81 | 2.52 | 17.0 | 0.49 | 1.0 | V | 1.8 | O.K. |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow | Wetted Perimeter | Hydraulic Radius | Top Width | Hydraulic Depth | Section Factor | Flow Rate | Average Velocity | Froude Number | Uniform-Flow Critical Slope | Comment |
|-----------------------------|---------------------------------|-----------------|------------------|------------------|-----------|-----------------|-------------------|--------------------|------------------|------------------|-----------------------------|---------|
| Y_c | n | A | P | $R=A/P$ | T | $D=A/T$ | $Z=AD^{1/2}$ | Q | V_c | F_r (Critical) | S_c | |
| ft | | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | # | ft/ft | |

Q2

| | | | | | | | | | | | | |
|-------------|-------|------|------|------|------|------|------|-----|------|------|-------|--|
| 0.42 | 0.035 | 2.03 | 5.88 | 0.35 | 5.68 | 0.36 | 1.22 | 6.9 | 3.39 | 1.00 | 0.026 | Slopes Near Sc - Check Freeboard. |
|-------------|-------|------|------|------|------|------|------|-----|------|------|-------|--|

Q25

| | | | | | | | | | | | | |
|-------------|-------|------|------|------|------|------|------|------|------|------|-------|------------------------|
| 0.73 | 0.053 | 3.99 | 7.26 | 0.55 | 6.92 | 0.58 | 3.02 | 17.2 | 4.31 | 1.00 | 0.053 | Flow Is Stable. |
|-------------|-------|------|------|------|------|------|------|------|------|------|-------|------------------------|

Determination of Minimum Channel Depth & Top Width (Based on Q25)

| Maximum Slope | | Minimum Slope | | |
|-----------------------|-------------------|-----------------------|-------------------|--|
| Minimum Channel Depth | Minimum Top Width | Minimum Channel Depth | Minimum Top Width | |
| ft | ft | ft | ft | |
| 1.48 | 9.92 | 1.59 | 10.36 | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-12 TRM

SHEET 7 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 28.7 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal : 1 vertical

Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.011 ft/ft

Minimum Channel Slope, S_{min} = 0.010 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) # | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|---|-------------------------------------|--|-------------|
| Y_n ft | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 1.46 | 0.054 | 10.10 | 10.53 | 0.96 | 9.84 | 1.03 | 2.83 | 28.6 | 0.49 | 1.0 | 5.0 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| 1.51 | 0.054 | 10.60 | 10.75 | 0.99 | 10.04 | 1.06 | 2.73 | 28.9 | 0.47 | 0.9 | 5.3 | O.K. |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) # | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|---|---|------------------------|
| Y_c ft | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | | ft/ft | |
| 0.98 | 0.049 | 5.84 | 8.38 | 0.70 | 7.92 | 0.74 | 5.02 | 28.5 | 4.87 | 1.00 | 0.042 | Flow Is Stable. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Minimum Channel Depth ft | Minimum Top Width T ft | Minimum Channel Depth ft | Minimum Top Width T ft | |
| 1.96 | 11.84 | 2.01 | 12.04 | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-13 TRM

SHEET 8 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 29.8 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft
 Left Side Slope, z_1 = 2.0 horizontal : 1 vertical
 Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D
 K = 34.6
 TRM Product Name = Propex - Landlok TRM 435, or equal
 τ_{allow} = 5.0 lb/ft²

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.011 ft/ft

Minimum Channel Slope, S_{min} = 0.010 ft/ft

Normal Depth

| Depth of Flow (Norm. Depth) Y_n ft | Manning's Roughness Coefficient n | Area of Flow A ft ² | Wetted Perimeter P ft | Hydraulic Radius $R=A/P$ ft | Top Width T ft | Hydraulic Depth $D=A/T$ ft | Average Velocity V_n ft/s | Flow Rate Q ft ³ /s | Froude Number F_r (Normal) # | Maximum Shear Stress τ_d lb/ft ² | Factor of Safety τ_{allow}/τ_d | Comment |
|---|--|---|----------------------------------|--------------------------------------|---------------------------|-------------------------------------|--------------------------------------|---|---|---|--|-------------|
| Maximum Slope: | | | | | | | | | | | | |
| 1.49 | 0.053 | 10.40 | 10.66 | 0.98 | 9.96 | 1.04 | 2.87 | 29.9 | 0.50 | 1.0 | 4.9 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| 1.53 | 0.054 | 10.80 | 10.84 | 1.00 | 10.12 | 1.07 | 2.77 | 29.9 | 0.47 | 1.0 | 5.2 | O.K. |

Critical Depth

| Depth of Flow (Crit. Depth) Y_c ft | Manning's Roughness Coefficient n | Area of Flow A ft ² | Wetted Perimeter P ft | Hydraulic Radius $R=A/P$ ft | Top Width T ft | Hydraulic Depth $D=A/T$ ft | Section Factor $Z=AD^{1/2}$ ft ^{2.5} | Flow Rate Q ft ³ /s | Average Velocity V_c ft/s | Froude Number F_r (Critical) # | Uniform-Flow Critical Slope S_c ft/ft | Comment |
|---|--|---|----------------------------------|--------------------------------------|---------------------------|-------------------------------------|--|---|--------------------------------------|---|--|------------------------|
| 1.01 | 0.049 | 6.08 | 8.52 | 0.71 | 8.04 | 0.76 | 5.29 | 30.0 | 4.93 | 1.00 | 0.041 | Flow Is Stable. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Minimum Channel Depth ft | Minimum Top Width T ft | Minimum Channel Depth ft | Minimum Top Width T ft | |
| 1.99 | 11.96 | 2.03 | 12.12 | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-14 TRM

SHEET 9 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 42.6 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal : 1 vertical

Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.012 ft/ft

Minimum Channel Slope, S_{min} = 0.010 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|------------------------------------|-------------------------------------|--|----------------|
| Y_n ft | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | # | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 1.69 | 0.050 | 12.47 | 11.56 | 1.08 | 10.76 | 1.16 | 3.42 | 42.6 | 0.56 | 1.3 | 4.0 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|--------------------------------------|---|------------------------|
| Y_c ft | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | # | ft/ft | |
| 1.23 | 0.046 | 7.95 | 9.50 | 0.84 | 8.92 | 0.89 | 7.50 | 42.6 | 5.36 | 1.00 | 0.035 | Flow Is Stable. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Minimum Channel Depth ft | Minimum Top Width T ft | Minimum Channel Depth ft | Minimum Top Width T ft | |
| 2.19 | 12.76 | #VALUE! | #VALUE! | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-15 TRM

SHEET 10 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 42.1 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal : 1 vertical

Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.050 ft/ft

Minimum Channel Slope, S_{min} = 0.049 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|------------------------------------|-------------------------------------|--|----------------|
| Y_n | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | # | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 1.10 | 0.046 | 6.82 | 8.92 | 0.76 | 8.40 | 0.81 | 6.11 | 41.7 | 1.20 | 3.4 | 1.5 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|--------------------------------------|---|------------------------|
| Y_c | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | # | ft/ft | |
| 1.22 | 0.047 | 7.86 | 9.46 | 0.83 | 8.88 | 0.88 | 7.39 | 41.9 | 5.34 | 1.00 | 0.036 | Flow Is Stable. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------|----------------------|-----------------------------|----------------------|--|
| Minimum Channel Depth | Minimum Top Width | Minimum Channel Depth | Minimum Top Width | |
| ft | T ft | ft | T ft | |
| 1.60 | 10.40 | #VALUE! | #VALUE! | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-16 TRM

SHEET 11 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 52.5 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal : 1 vertical

Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.040 ft/ft

Minimum Channel Slope, S_{min} = 0.036 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|------------------------------------|-------------------------------------|--|----------------|
| Y_n | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | # | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 1.30 | 0.045 | 8.58 | 9.81 | 0.87 | 9.20 | 0.93 | 6.08 | 52.2 | 1.11 | 3.2 | 1.5 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|--------------------------------------|---|--|
| Y_c | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | # | ft/ft | |
| 1.38 | 0.045 | 9.33 | 10.17 | 0.92 | 9.52 | 0.98 | 9.23 | 52.4 | 5.62 | 1.00 | 0.033 | Slopes Near Sc - Check Freeboard. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------|----------------------|-----------------------------|----------------------|--|
| Minimum Channel Depth | Minimum Top Width | Minimum Channel Depth | Minimum Top Width | |
| ft | T ft | ft | T ft | |
| 1.80 | 11.20 | #VALUE! | #VALUE! | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-17 TRM

SHEET 12 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 53.2 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal : 1 vertical

Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.013 ft/ft

Minimum Channel Slope, S_{min} = 0.012 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|------------------------------------|-------------------------------------|--|----------------|
| Y_n ft | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | # | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 1.82 | 0.048 | 13.90 | 12.14 | 1.15 | 11.28 | 1.23 | 3.85 | 53.5 | 0.61 | 1.5 | 3.4 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|--------------------------------------|---|------------------------|
| Y_c ft | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | # | ft/ft | |
| 1.39 | 0.045 | 9.42 | 10.22 | 0.92 | 9.56 | 0.99 | 9.36 | 53.1 | 5.63 | 1.00 | 0.033 | Flow Is Stable. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Minimum Channel Depth ft | Minimum Top Width T ft | Minimum Channel Depth ft | Minimum Top Width T ft | |
| 2.32 | 13.28 | #VALUE! | #VALUE! | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-18 TRM

SHEET 13 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 73.4 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal :1 vertical

Right Side Slope, z_2 = 2.0 horizontal :1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.014 ft/ft

Minimum Channel Slope, S_{min} = 0.011 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|------------------------------------|-------------------------------------|--|----------------|
| Y_n ft | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | # | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 2.04 | 0.046 | 16.48 | 13.12 | 1.26 | 12.16 | 1.36 | 4.46 | 73.5 | 0.68 | 1.8 | 2.8 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|--------------------------------------|---|------------------------|
| Y_c ft | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | # | ft/ft | |
| 1.66 | 0.044 | 12.15 | 11.42 | 1.06 | 10.64 | 1.14 | 12.99 | 73.7 | 6.06 | 1.00 | 0.029 | Flow Is Stable. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Minimum Channel Depth ft | Minimum Top Width T ft | Minimum Channel Depth ft | Minimum Top Width T ft | |
| 2.54 | 14.16 | #VALUE! | #VALUE! | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-21 TRM

SHEET 14 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 2.3 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal : 1 vertical

Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.130 ft/ft

Minimum Channel Slope, S_{min} = 0.120 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|------------------------------------|-------------------------------------|--|----------------|
| Y_n ft | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | # | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 0.24 | 0.091 | 1.08 | 5.07 | 0.21 | 4.96 | 0.22 | 2.10 | 2.3 | 0.79 | 1.9 | 2.6 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|--------------------------------------|---|------------------------|
| Y_c ft | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | # | ft/ft | |
| 0.21 | 0.094 | 0.93 | 4.94 | 0.19 | 4.84 | 0.19 | 0.41 | 2.3 | 2.48 | 1.00 | 0.227 | Flow Is Stable. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Minimum Channel Depth ft | Minimum Top Width T ft | Minimum Channel Depth ft | Minimum Top Width T ft | |
| 0.74 | 6.96 | #VALUE! | #VALUE! | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-22 TRM

SHEET 15 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 7.8 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal : 1 vertical

Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.045 ft/ft

Minimum Channel Slope, S_{min} = 0.050 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|------------------------------------|-------------------------------------|--|----------------|
| Y_n ft | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | # | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 0.54 | 0.064 | 2.74 | 6.41 | 0.43 | 6.16 | 0.45 | 2.81 | 7.7 | 0.74 | 1.5 | 3.3 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|--------------------------------------|---|------------------------|
| Y_c ft | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | # | ft/ft | |
| 0.45 | 0.061 | 2.21 | 6.01 | 0.37 | 5.80 | 0.38 | 1.36 | 7.7 | 3.50 | 1.00 | 0.079 | Flow Is Stable. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Minimum Channel Depth ft | Minimum Top Width T ft | Minimum Channel Depth ft | Minimum Top Width T ft | |
| 1.04 | 8.16 | #VALUE! | #VALUE! | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-23 TRM

SHEET 16 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 10.1 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal : 1 vertical

Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.109 ft/ft

Minimum Channel Slope, S_{min} = 0.090 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) # | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|---|-------------------------------------|--|-------------|
| Y_n ft | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 0.46 | 0.057 | 2.26 | 6.06 | 0.37 | 5.84 | 0.39 | 4.47 | 10.1 | 1.27 | 3.1 | 1.6 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| 0.49 | 0.058 | 2.44 | 6.19 | 0.39 | 5.96 | 0.41 | 4.17 | 10.2 | 1.15 | 2.8 | 1.8 | O.K. |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) # | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|---|---|--|
| Y_c ft | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | | ft/ft | |
| 0.53 | 0.059 | 2.68 | 6.37 | 0.42 | 6.12 | 0.44 | 1.78 | 10.1 | 3.76 | 1.00 | 0.070 | Slopes Near S_c - Check Freeboard. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Minimum Channel Depth ft | Minimum Top Width T ft | Minimum Channel Depth ft | Minimum Top Width T ft | |
| 0.96 | 7.84 | 0.99 | 7.96 | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-24 TRM

SHEET 17 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 15.3 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal : 1 vertical

Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.120 ft/ft

Minimum Channel Slope, S_{min} = 0.100 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) # | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|---|-------------------------------------|--|-------------|
| Y_n ft | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 0.53 | 0.051 | 2.68 | 6.37 | 0.42 | 6.12 | 0.44 | 5.63 | 15.1 | 1.50 | 4.0 | 1.3 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| 0.56 | 0.052 | 2.87 | 6.50 | 0.44 | 6.24 | 0.46 | 5.23 | 15.0 | 1.36 | 3.5 | 1.4 | O.K. |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) # | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|---|---|------------------------|
| Y_c ft | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | | ft/ft | |
| 0.68 | 0.054 | 3.64 | 7.04 | 0.52 | 6.72 | 0.54 | 2.68 | 15.2 | 4.18 | 1.00 | 0.055 | Flow Is Stable. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Minimum Channel Depth ft | Minimum Top Width T ft | Minimum Channel Depth ft | Minimum Top Width T ft | |
| 1.03 | 8.12 | 1.06 | 8.24 | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-25 TRM

SHEET 18 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 18.2 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal : 1 vertical

Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.110 ft/ft

Minimum Channel Slope, S_{min} = 0.100 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|------------------------------------|-------------------------------------|--|-------------|
| Y_n | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | # | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 0.59 | 0.050 | 3.06 | 6.64 | 0.46 | 6.36 | 0.48 | 5.90 | 18.0 | 1.50 | 4.0 | 1.2 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| 0.61 | 0.050 | 3.18 | 6.73 | 0.47 | 6.44 | 0.49 | 5.70 | 18.2 | 1.43 | 3.8 | 1.3 | O.K. |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|--------------------------------------|---|------------------------|
| Y_c | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | # | ft/ft | |
| 0.75 | 0.052 | 4.13 | 7.35 | 0.56 | 7.00 | 0.59 | 3.17 | 18.0 | 4.36 | 1.00 | 0.051 | Flow Is Stable. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------|----------------------|-----------------------------|----------------------|--|
| Minimum Channel Depth | Minimum Top Width | Minimum Channel Depth | Minimum Top Width | |
| ft | T | ft | T | |
| 1.09 | 8.36 | 1.11 | 8.44 | |

PROJECT Chambers County Landfill

SUBJECT Drainage Channel Analysis (TRM Lined)

Channel No. PC-26 TRM

SHEET 19 of 22
 JOB # CHAMBERS-24-1
 DATE 4/12/2024
 COMPUTED BY Megan Skvoretz
 CHECKED BY Greg Mills

Design Parameters:

PEAK DISCHARGE, Q_{25} = 50.0 ft³/s

Source: HydroCAD 25-Yr 24-Hr

Bottom Width, B = 4.0 ft

Left Side Slope, z_1 = 2.0 horizontal : 1 vertical

Right Side Slope, z_2 = 2.0 horizontal : 1 vertical

Minimum Freeboard = 0.50 ft

Maximum Channel Slope, S_{max} = 0.013 ft/ft

Minimum Channel Slope, S_{min} = 0.012 ft/ft

Turf Reinforcement Matting (TRM) Lining:

Grass Retardance = D

K = 34.6

TRM Product Name = Propex - Landlok TRM 435, or equal

τ_{allow} = 5.0 lb/ft²

Normal Depth

| Depth of Flow (Norm. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Average Velocity V_n | Flow Rate Q | Froude Number F_r (Normal) # | Maximum Shear Stress τ_d | Factor of Safety τ_{allow}/τ_d | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|------------------------------|---------------------|---|-------------------------------------|--|-------------|
| Y_n ft | n | ft ² | ft | ft | ft | ft | ft/s | ft ³ /s | | lb/ft ² | | |
| Maximum Slope: | | | | | | | | | | | | |
| 1.77 | 0.049 | 13.35 | 11.92 | 1.12 | 11.08 | 1.20 | 3.76 | 50.1 | 0.60 | 1.4 | 3.5 | O.K. |
| Minimum Slope: | | | | | | | | | | | | |
| 1.81 | 0.049 | 13.79 | 12.09 | 1.14 | 11.24 | 1.23 | 3.63 | 50.1 | 0.58 | 1.4 | 3.7 | O.K. |

Critical Depth

| Depth of Flow (Crit. Depth) | Manning's Roughness Coefficient | Area of Flow A | Wetted Perimeter P | Hydraulic Radius $R=A/P$ | Top Width T | Hydraulic Depth $D=A/T$ | Section Factor $Z=AD^{1/2}$ | Flow Rate Q | Average Velocity V_c | Froude Number F_r (Critical) # | Uniform-Flow Critical Slope S_c | Comment |
|--------------------------------|---------------------------------------|------------------------|----------------------------|--------------------------------|---------------------|-------------------------------|-----------------------------------|---------------------|------------------------------|---|---|------------------------|
| Y_c ft | n | ft ² | ft | ft | ft | ft | ft ^{2.5} | ft ³ /s | ft/s | | ft/ft | |
| 1.34 | 0.046 | 8.95 | 9.99 | 0.90 | 9.36 | 0.96 | 8.75 | 49.7 | 5.55 | 1.00 | 0.033 | Flow Is Stable. |

Determination of Minimum Channel Depth & Top Width

| Maximum Slope | | Minimum Slope | | |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--|
| Minimum Channel Depth ft | Minimum Top Width T ft | Minimum Channel Depth ft | Minimum Top Width T ft | |
| 2.27 | 13.08 | 2.31 | 13.24 | |

PROJECT Chambers County Landfill

SHEET 20 of 22

SUBJECT Rock Chute Rip Rap sizing

JOB # CHAMBERS-24-1

DATE 4/12/2024

COMPUTED BY Greg Mills

CHECKED BY JCL

Channel No. Rock Chute Summary

| ROCK CHUTE SCHEDULE | | | | | | |
|---------------------|------------------------|-------------|-------------------------------------|----------------|-------------------------|---------------------------|
| Chute | Q ₂₅ CFS | WIDTH FT | q (FLOW PER FOOT WIDTH) | SLOPE FT/FT | D ₅₀ FEET | D ₅₀ INCHES |
| RC-1 | 18.6 | 7 | 2.7 | 0.33 | 0.55 | 7 |
| RC-2 | 12.2 | 5 | 2.4 | 0.33 | 0.53 | 6 |
| RC-3 | 11.1 | 5 | 2.2 | 0.33 | 0.50 | 6 |
| RC-4 | 5.5 | 3 | 1.8 | 0.33 | 0.45 | 5 |
| RC-5 | 10.0 | 5 | 2.0 | 0.33 | 0.48 | 6 |
| RC-6 | 31.3 | 10 | 3.1 | 0.33 | 0.60 | 7 |
| RC-7 | 32.2 | 10 | 3.2 | 0.33 | 0.61 | 7 |
| RC-8 | 11.2 | 5 | 2.2 | 0.33 | 0.51 | 6 |

NOTES:

Flows are from the 25-year/24-hour storm, as calculated using HydroCAD v 8.0.

Rip Rap d50 size is calculated using the formula from the "Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas" (Reference 1), which is:

$$d_{50} = [q (S)^{0.58} / 3.93(10)^{-2}]^{1/1.89}$$

d50 = Particle size for which 50% of the sample is finer, inch

S = Bed slope, ft./ft.

q = Unit discharge, ft³/s/ft. (Total discharge ÷ Bottom width)

Reference 1. Alabama Soil and Water Conservation Committee (2022), "Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas" pp. 213 to 217, July 2022.

PROJECT Chambers County Landfill

SUBJECT Rock Chute Rip Rap sizing

Channel No. Rock Chute Summary

SHEET 21 of 22

JOB # CHAMBERS-24-1

DATE 4/12/2024

COMPUTED BY Greg Mills

CHECKED BY JCL

Rip rap sizing from "Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas" (2022)

Stable Rock Size

Stable rock sizes, for rock lined swales having gradients between 2 percent and 40 percent should be determined using the following formulas from Design of Rock Chutes by Robinson, Rice, and Kadavy.

For swale slopes between 2% and 10%: $d_{50} = [q(S)^{1.5}/4.75(10)^{-3}]^{1/1.89}$

For swale slopes between 10% and 40%: $d_{50} = [q(S)^{0.58}/3.93(10)^{-2}]^{1/1.89}$

d_{50} = Particle size for which 50 % of the sample is finer, inch

S = Bed slope, ft./ft.

q = Unit discharge, ft³/s/ft.

(Total discharge ÷ Bottom width)

After the stable median stone size is determined, the gradation of rock to be used should be specified using Tables RS-1 and RS-2. Table RS-1 is used to determine the weight of the median stone size (d_{50}). Using this median weight, a gradation can be selected from Table RS-2, which shows the commercially available riprap gradations as classified by the Alabama Department of Transportation.

PROJECT Chambers County Landfill

SUBJECT Rock Chute Rip Rap sizing

Channel No. Rock Chute Summary

SHEET 22 of 22

JOB # CHAMBERS-24-1

DATE 4/12/2024

COMPUTED BY Greg Mills

CHECKED BY JCL

Standard Riprap sizes, Tables RS-1 and RS-2 from Ref. 1, Page 216

Table RS-1 Size of Riprap Stones

| Weight (lbs.) | Mean Spherical Diameter (feet) | Rectangular Shape | |
|------------------|--------------------------------------|-------------------|-------------------------|
| | | Length (feet) | Width, Height (feet) |
| 50 | 0.8 | 1.4 | 0.5 |
| 100 | 1.1 | 1.75 | 0.6 |
| 150 | 1.3 | 2.0 | 0.67 |
| 300 | 1.6 | 2.6 | 0.9 |
| 500 | 1.9 | 3.0 | 1.0 |
| 1000 | 2.2 | 3.7 | 1.25 |
| 1500 | 2.6 | 4.7 | 1.5 |
| 2000 | 2.75 | 5.4 | 1.8 |
| 4000 | 3.6 | 6.0 | 2.0 |
| 6000 | 4.0 | 6.9 | 2.3 |
| 8000 | 4.5 | 7.6 | 2.5 |
| 20000 | 6.1 | 10.0 | 3.3 |

Table RS-2 Graded Riprap

| Class | Weight (lbs.) | | | | | |
|-------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | d ₁₀ | d ₁₅ | d ₂₅ | d ₅₀ | d ₇₅ | d ₉₀ |
| 1 | 10 | - | - | 50 | - | 100 |
| 2 | 10 | - | - | 80 | - | 200 |
| 3 | - | 25 | - | 200 | - | 500 |
| 4 | - | - | 50 | 500 | 1000 | - |
| 5 | - | - | 200 | 1000 | - | 2000 |

EFF2, 0-6 Ehb

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PROJECT Chambers County C&D Landfill

SHEET 1 OF 19

DATE 4/5/2024

COMPUTED BY MEGAN SKVORETZ

SUBJECT Culvert Design

JOB # CHAMBERS-24-1

CHECKED BY Greg Mills

OBJECTIVE: To design culverts to handle stormwater flow from the design storm(s). The main design criteria will be to ensure that all culverts will be able to accommodate the peak discharge from the design storm without exceeding the allowable headwater depth.

REFERENCE: Debo, T.N., and Reese, A.J., Municipal Storm Water Management, Lewis Publishers, Boca Raton, FL, 1995, p. 333.

ANALYSIS: The following approach is used in the design of culverts (after Debo and Reese):

1. Determine the peak discharge from the design storm(s) (from HydroCAD or spreadsheet methods). Use the peak discharge from the 25-Yr 24-Hr storm unless otherwise specified.

2. Input Culvert Parameters:

- HW_A = allowable headwater depth (ft)
- N = number of pipes used
- Q_{PIPE} = peak discharge /N (cfs)
- D = culvert diameter (in)
- Type of Culvert (i.e., Concrete, CMP, etc.)
- L = culvert length (ft)
- s = culvert slope (ft/ft)
- n = Manning's number
- K_e = entrance loss coefficient
- d_c = critical depth (use critical depth figures) (ft)

CALCULATIONS:

- Inlet Control:

- A. Enter Inlet Control Nomograph with D & Q_{PIPE} and find HW/D for the proper entrance type.
- B. Compute HW . If HW exceeds HW_A , try larger culvert.

- Outlet Control:

- A. Enter outlet control nomograph with L , K_e , & D .
- B. To compute HW , connect the length scale for the type of entrance condition and culvert diameter scale with a straight line, pivot on the turning line, and draw a straight line from the design discharge through the turning point to the head loss scale H. Compute HW from the following equation:

$$HW = H + h_o - LS$$

where: $h_o = \left(\frac{d_c + D}{2} \right)$ or tailwater depth, whichever is greater.

- C. If HW exceeds HW_A , try larger culvert.

PROJECT Chambers County C&D Landfill
SUBJECT Culvert Design

SHEET 2 of 19
JOB # CHAMBERS-24-1
DATE 4/5/2024
COMPUTED BY MEGAN SKVORETZ
CHECKED BY Greg Mills

Culvert No.: C-11

Peak Discharge:

PEAK DISCHARGE, Q25 (cfs) = 3.6

Source: HydroCAD 25-Yr 24-Hr

Culvert Parameters:

Allowable HW Depth (ft) = 3
Number of Pipes, N = 1
Culvert Diameter, D (in) = 24
Type of Culvert = CMP
Invert In Elev. (ft) = 768.0
Culvert Length, L (ft) = 48
Culvert Slope, S (ft/ft) = 0.125
Manning's Number, n = 0.022
Entrance Loss Coef., ke = 0.5
Critical Depth (ft) = 0.9
Tailwater Depth (ft) = 0.7

Qpipe (cfs) = 3.6

Invert Out Elev. (ft) = 762.0

Case 1: Inlet Control

HW/D = 0.5 (From Inlet Control Nomograph)
HW (ft) = 1.0

INLET CONTROL GOVERNS!

Case 2: Outlet Control

ho (ft) = 1.5
H (ft) = 0.1 (From Outlet Control Nomograph)
HW (ft) = -4.5

PROJECT Chambers County C&D Landfill
 SUBJECT Culvert Design

SHEET 3 of 19
 JOB # CHAMBERS-24-1
 DATE 4/5/2024
 COMPUTED BY MEGAN SKVORETZ
 CHECKED BY Greg Mills

Culvert No.: C-12

Peak Discharge:

PEAK DISCHARGE, Q25 (cfs) = 73.8 Source: HydroCAD 25-Yr 24-Hr

Culvert Parameters:

| | | | |
|----------------------------|------------|-------------------------|-------|
| Allowable HW Depth (ft) = | <u>3.2</u> | Qpipe (cfs) = | 24.6 |
| Number of Pipes, N = | 3 | | |
| Culvert Diameter, D (in) = | 36 | | |
| Type of Culvert = | CMP | | |
| Invert In Elev. (ft) = | 706.0 | Invert Out Elev. (ft) = | 705.4 |
| Culvert Length, L (ft) = | 40 | | |
| Culvert Slope, S (ft/ft) = | 0.015 | | |
| Manning's Number, n = | 0.022 | | |
| Entrance Loss Coef., ke = | 0.5 | | |
| Critical Depth (ft) = | 2.0 | | |
| Tailwater Depth (ft) = | 0.0 | | |

Case 1: Inlet Control

HW/D = 1.1 (From Inlet Control Nomograph)
 HW (ft) = 3.2 INLET CONTROL GOVERNS!

Case 2: Outlet Control

ho (ft) = 0.0 outlets to the basin
 H (ft) = 2.5 (From Outlet Control Nomograph)
 HW (ft) = 1.9



PROJECT Chambers County C&D Landfill
 SUBJECT Culvert Design

SHEET 4 of 19
 JOB # CHAMBERS-24-1
 DATE 4/5/2024
 COMPUTED BY MEGAN SKVORETZ
 CHECKED BY Greg Mills

Culvert No.: C-21

Peak Discharge:

PEAK DISCHARGE, Q25 (cfs) = 19.5 Source: HydroCAD 25-Yr 24-Hr

Culvert Parameters:

| | | | |
|----------------------------|----------|-------------------------|-------|
| Allowable HW Depth (ft) = | <u>3</u> | Qpipe (cfs) = | 19.5 |
| Number of Pipes, N = | 1 | | |
| Culvert Diameter, D (in) = | 30 | | |
| Type of Culvert = | CMP | | |
| Invert In Elev. (ft) = | 729.1 | Invert Out Elev. (ft) = | 728.5 |
| Culvert Length, L (ft) = | 60 | | |
| Culvert Slope, S (ft/ft) = | 0.01 | | |
| Manning's Number, n = | 0.022 | | |
| Entrance Loss Coef., ke = | 0.5 | | |
| Critical Depth (ft) = | 1.5 | | |
| Tailwater Depth (ft) = | 0.5 | | |

Case 1: Inlet Control

HW/D = 1.0 (From Inlet Control Nomograph)
 HW (ft) = 2.4 **INLET CONTROL GOVERNS!**

Case 2: Outlet Control

ho (ft) = 2.0
 H (ft) = 1.0 (From Outlet Control Nomograph)
 HW (ft) = 2.4



PROJECT Chambers County C&D Landfill
SUBJECT Culvert Design

SHEET 5 of 19
JOB # CHAMBERS-24-1
DATE 4/5/2024
COMPUTED BY MEGAN SKVORETZ
CHECKED BY Greg Mills

Culvert No.: C-22

Peak Discharge:

PEAK DISCHARGE, Q25 (cfs) = 56.3 Source: HydroCAD 25-Yr 24-Hr

Culvert Parameters:

| | | | |
|----------------------------|--------------|-------------------------|--------------|
| Allowable HW Depth (ft) = | <u>3</u> | Qpipe (cfs) = | <u>28.2</u> |
| Number of Pipes, N = | <u>2</u> | Invert Out Elev. (ft) = | <u>704.1</u> |
| Culvert Diameter, D (in) = | <u>30</u> | | |
| Type of Culvert = | <u>CMP</u> | | |
| Invert In Elev. (ft) = | <u>704.7</u> | | |
| Culvert Length, L (ft) = | <u>40</u> | | |
| Culvert Slope, S (ft/ft) = | <u>0.015</u> | | |
| Manning's Number, n = | <u>0.022</u> | | |
| Entrance Loss Coef., ke = | <u>0.5</u> | | |
| Critical Depth (ft) = | <u>1.7</u> | | |
| Tailwater Depth (ft) = | <u>0.0</u> | | |

Case 1: Inlet Control

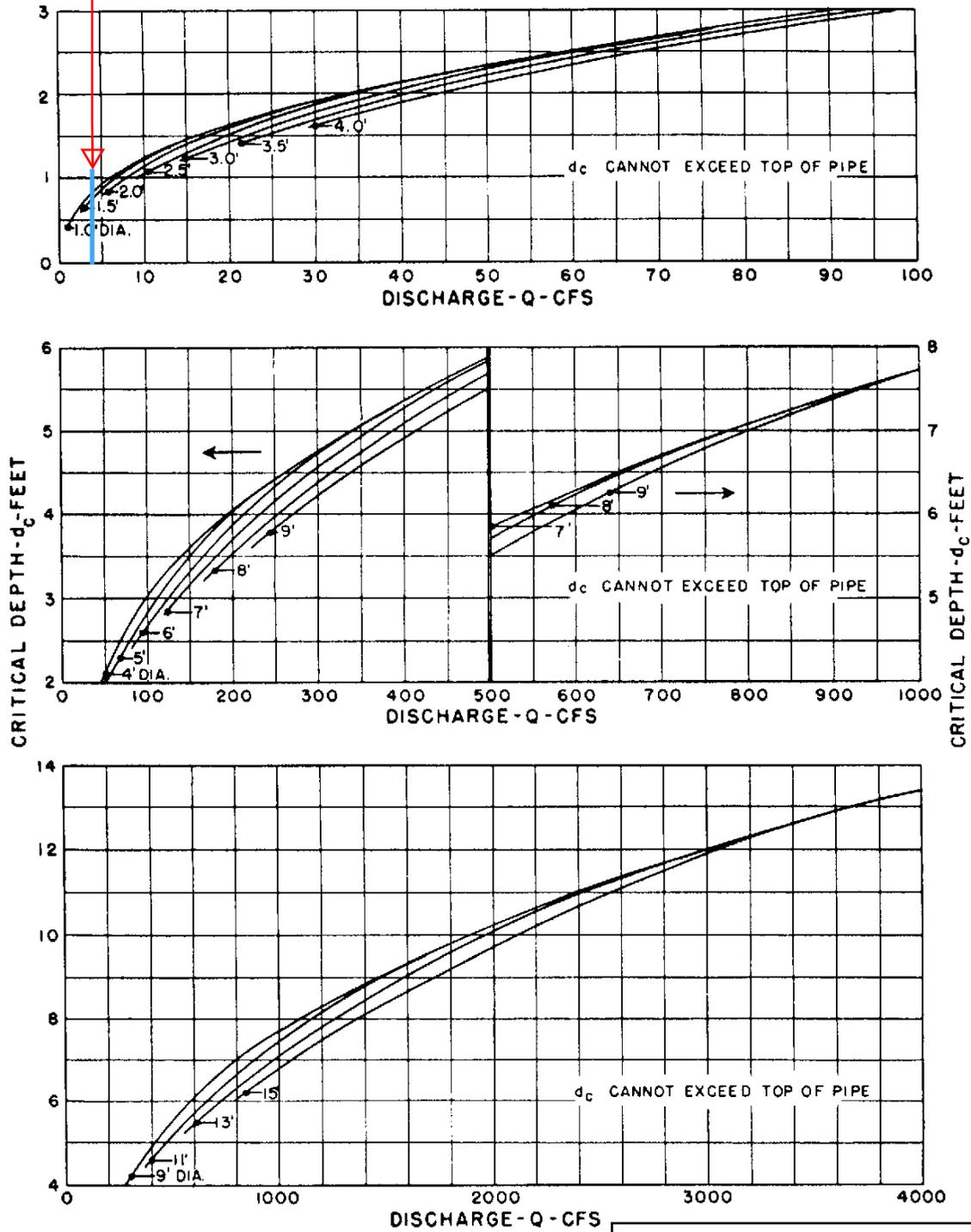
HW/D = 1.1 (From Inlet Control Nomograph)
HW (ft) = 2.8 **INLET CONTROL GOVERNS!**

Case 2: Outlet Control

ho (ft) = 0.0 outlets to the basin
H (ft) = 1.2 (From Outlet Control Nomograph)
HW (ft) = 0.6

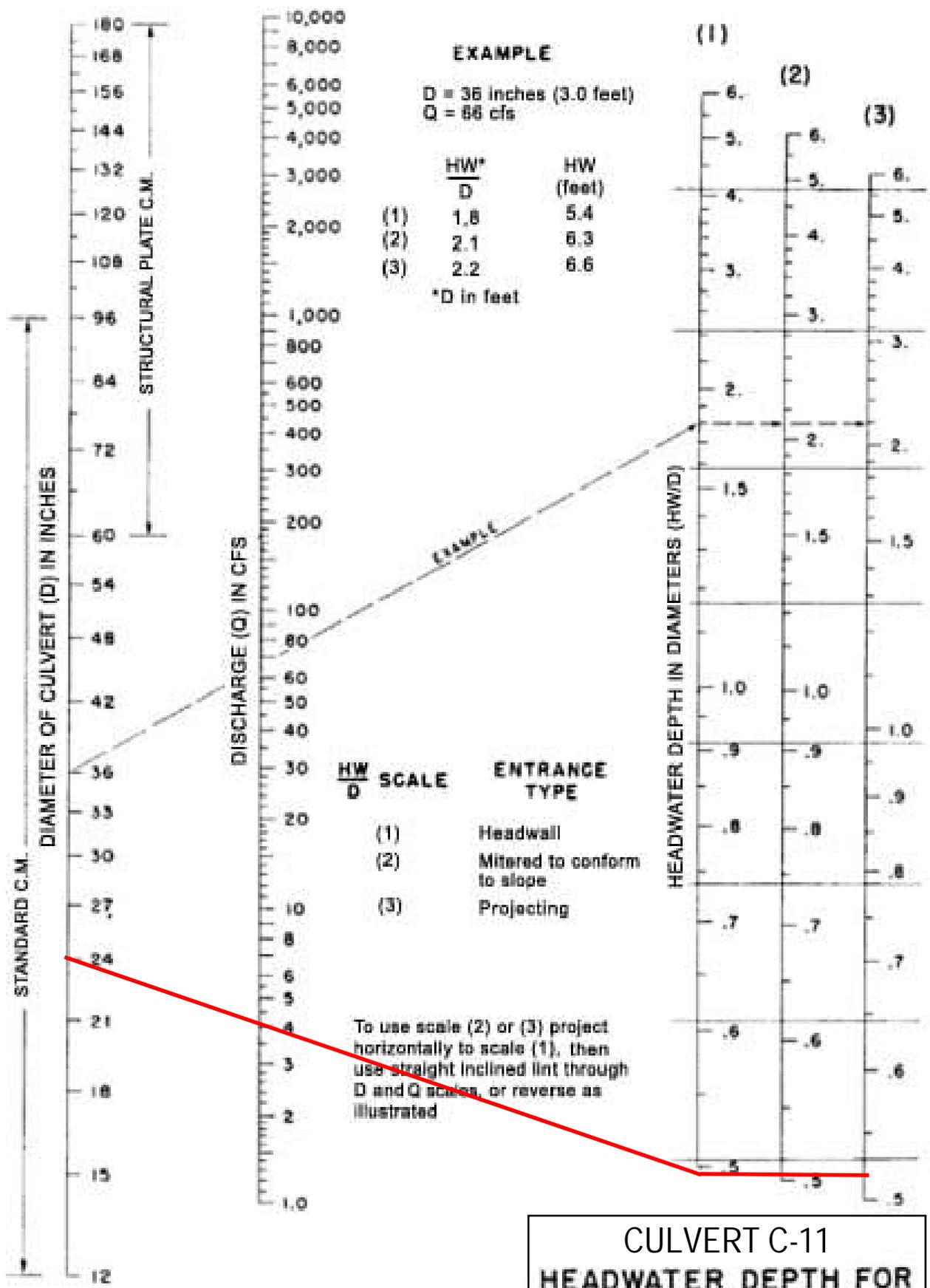
The 25-yr/24-hr storm flow of 3.9 CFS does not cause the flow depth to reach the critical depth of the culvert.

CHART 4B

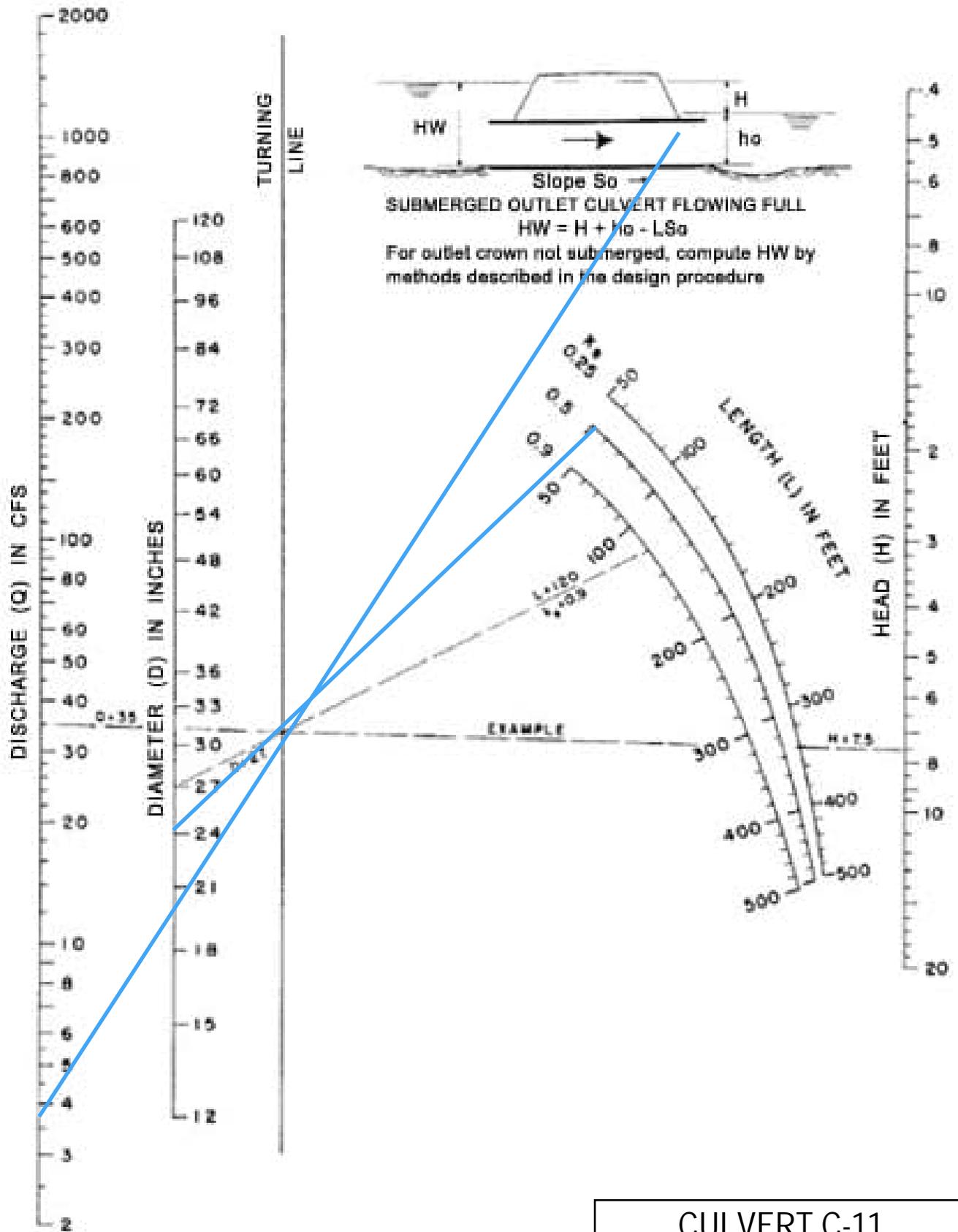


BUREAU OF PUBLIC ROADS
JAN. 1964

CULVERT C-11
CRITICAL DEPTH
CIRCULAR PIPE

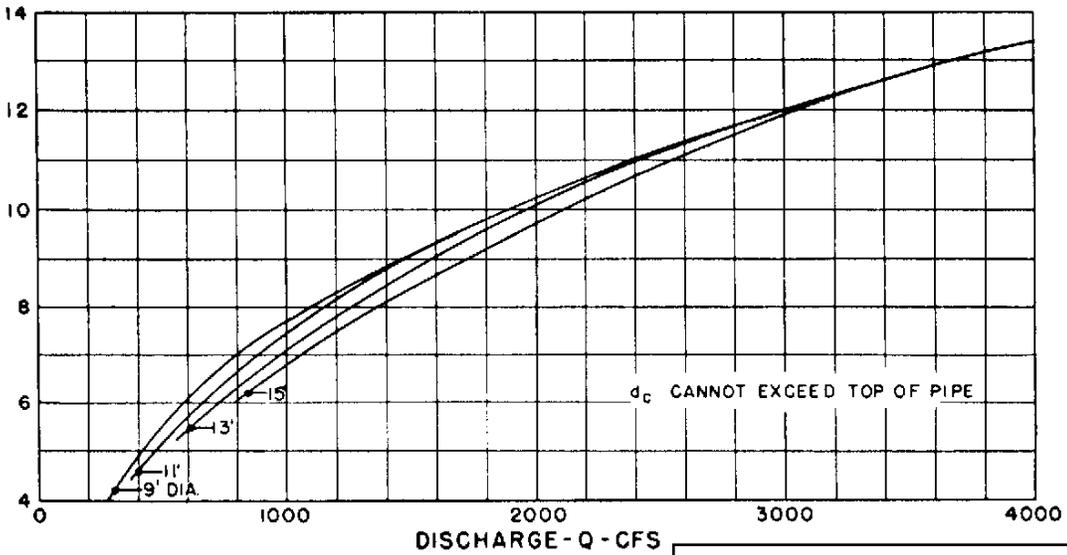
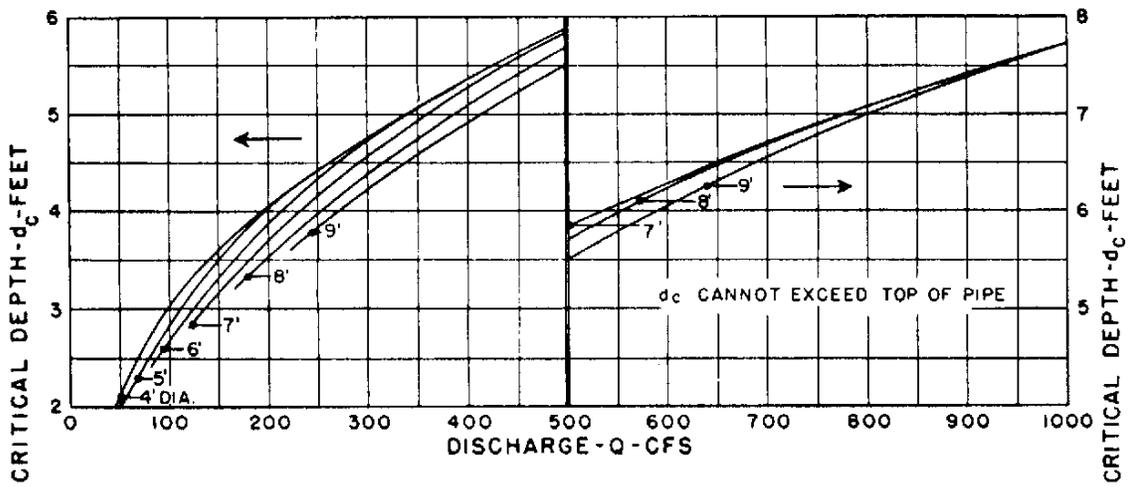
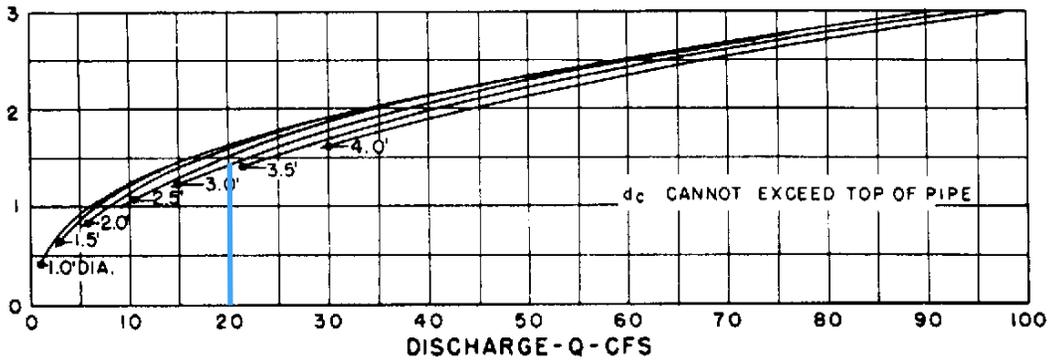


CULVERT C-11
 HEADWATER DEPTH FOR
 C. M. PIPE CULVERTS
 WITH INLET CONTROL



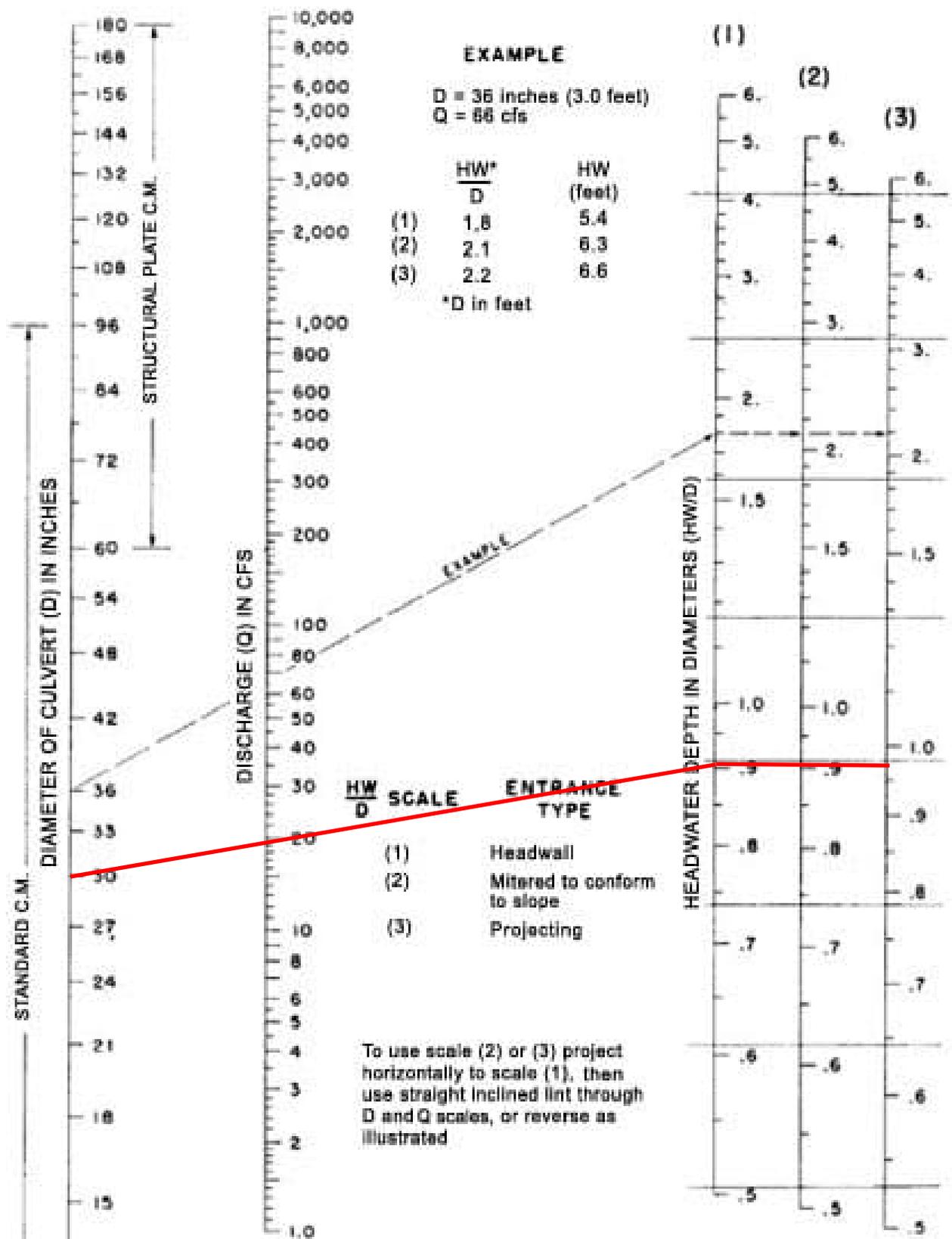
CULVERT C-11
 HEAD FOR
 STANDARD
 G. M. PIPE CULVERTS
 FLOWING FULL
 $n = 0.024$

CHART 4B

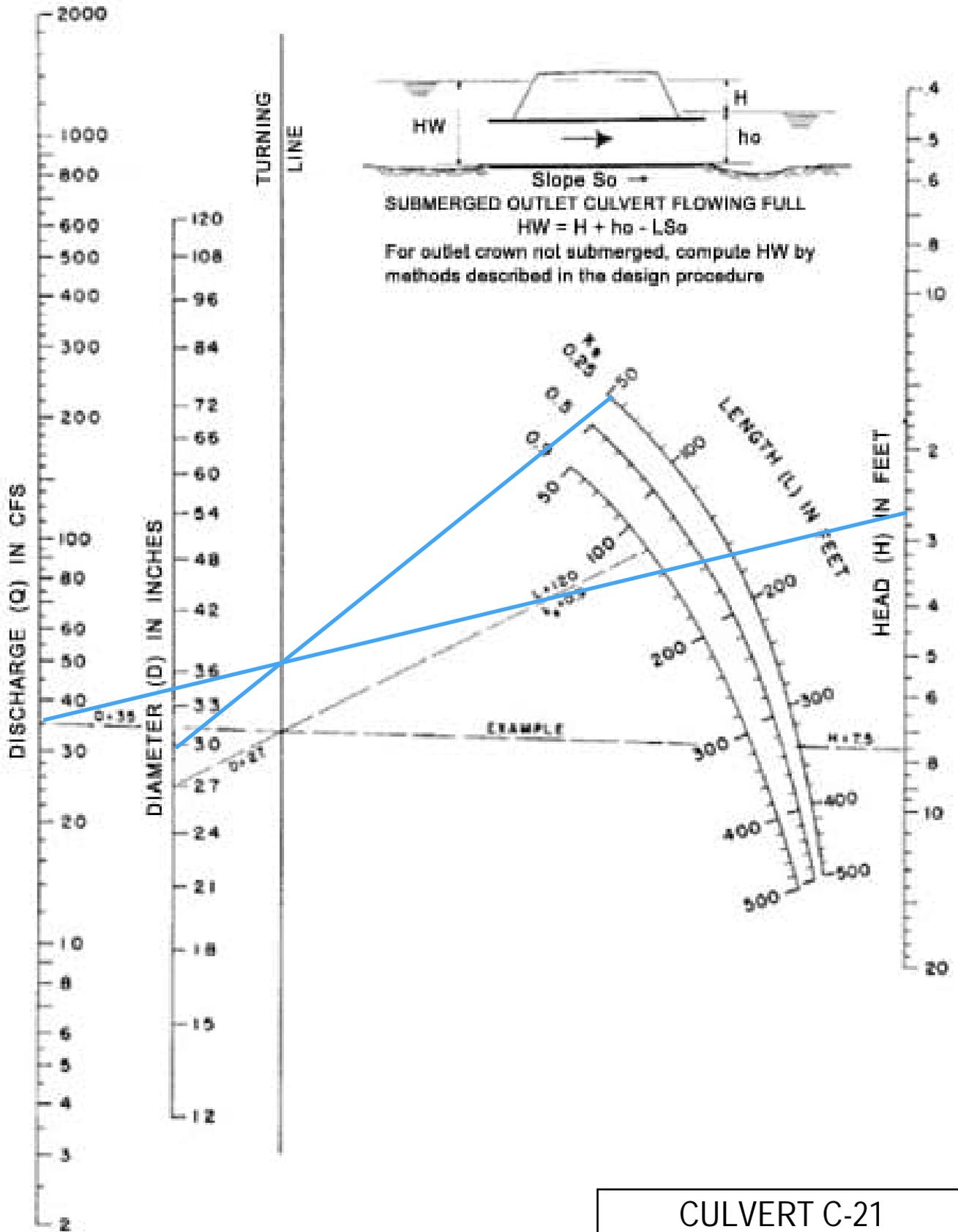


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CULVERT C-21
CRITICAL DEPTH
CIRCULAR PIPE

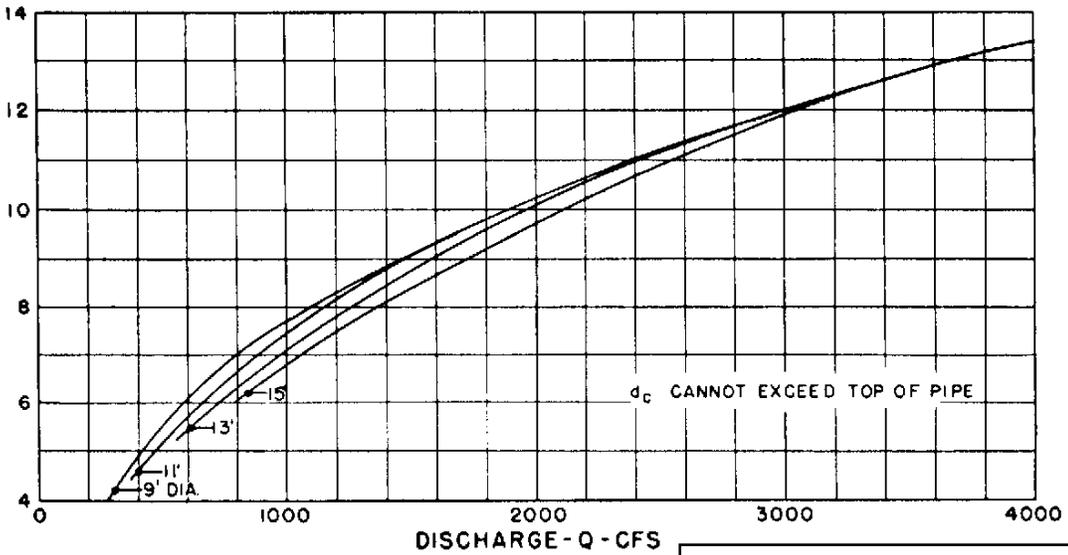
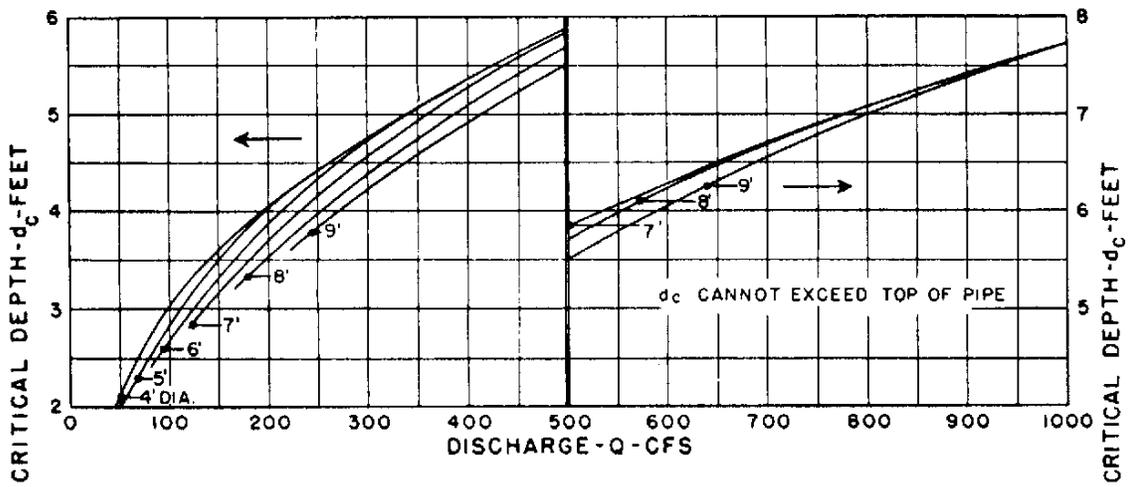
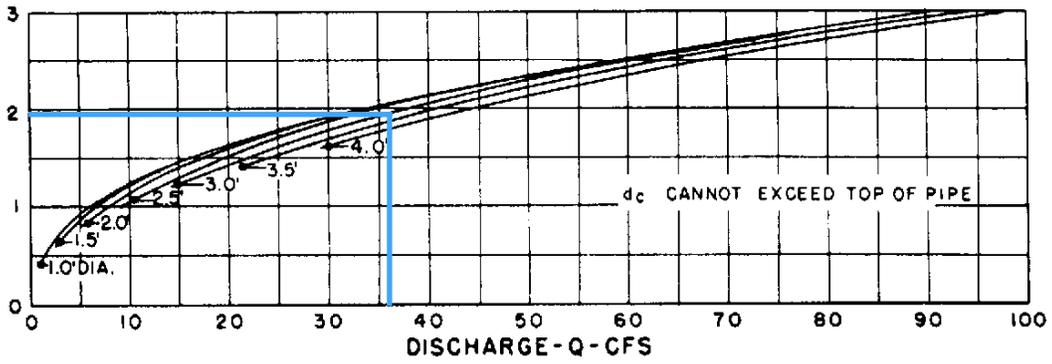


**CULVERT C-21
 HEADWATER DEPTH FOR
 C. M. PIPE CULVERTS
 WITH INLET CONTROL**



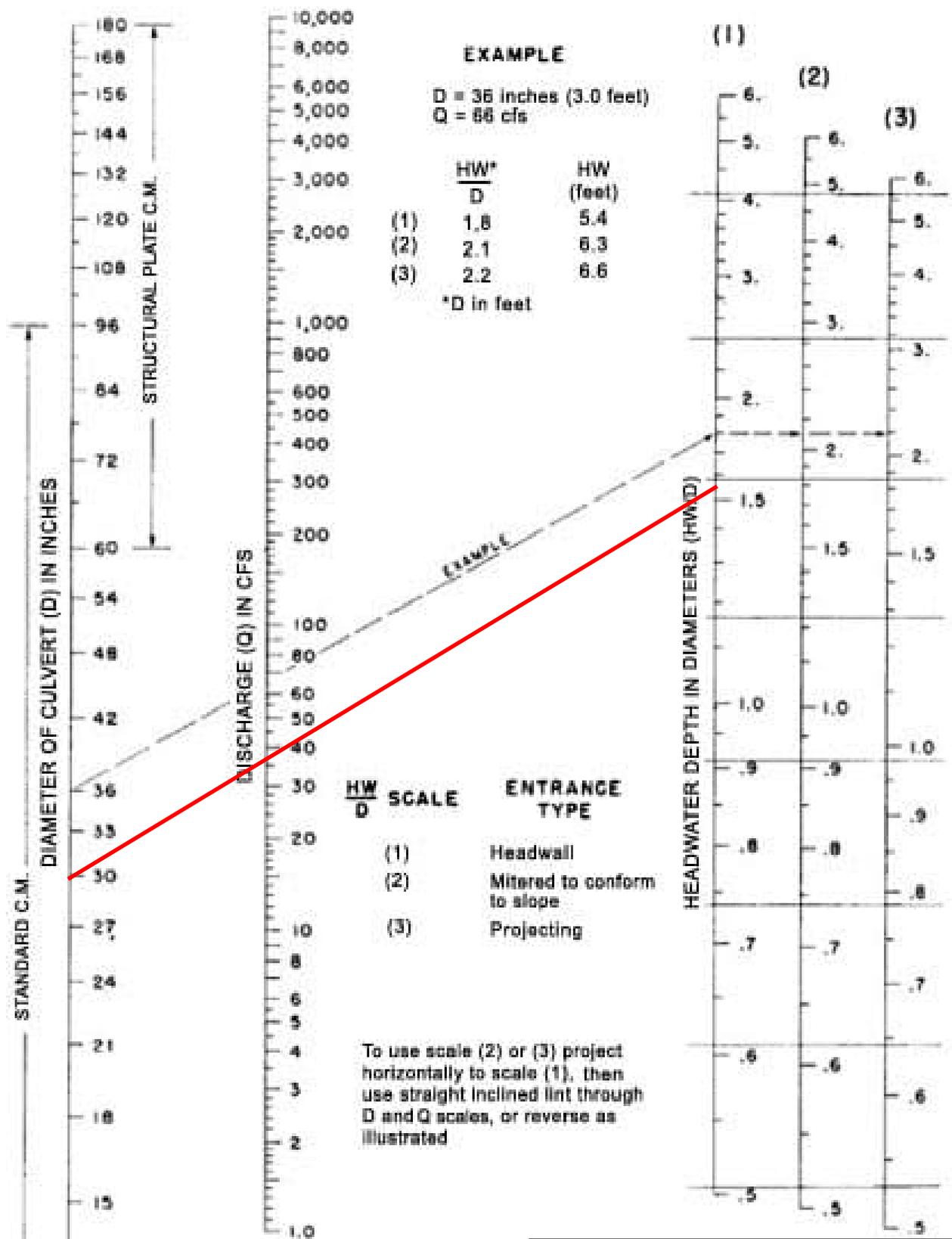
CULVERT C-21
 HEAD FOR
 STANDARD
 G. M. PIPE CULVERTS
 FLOWING FULL
 $n = 0.024$

CHART 4B

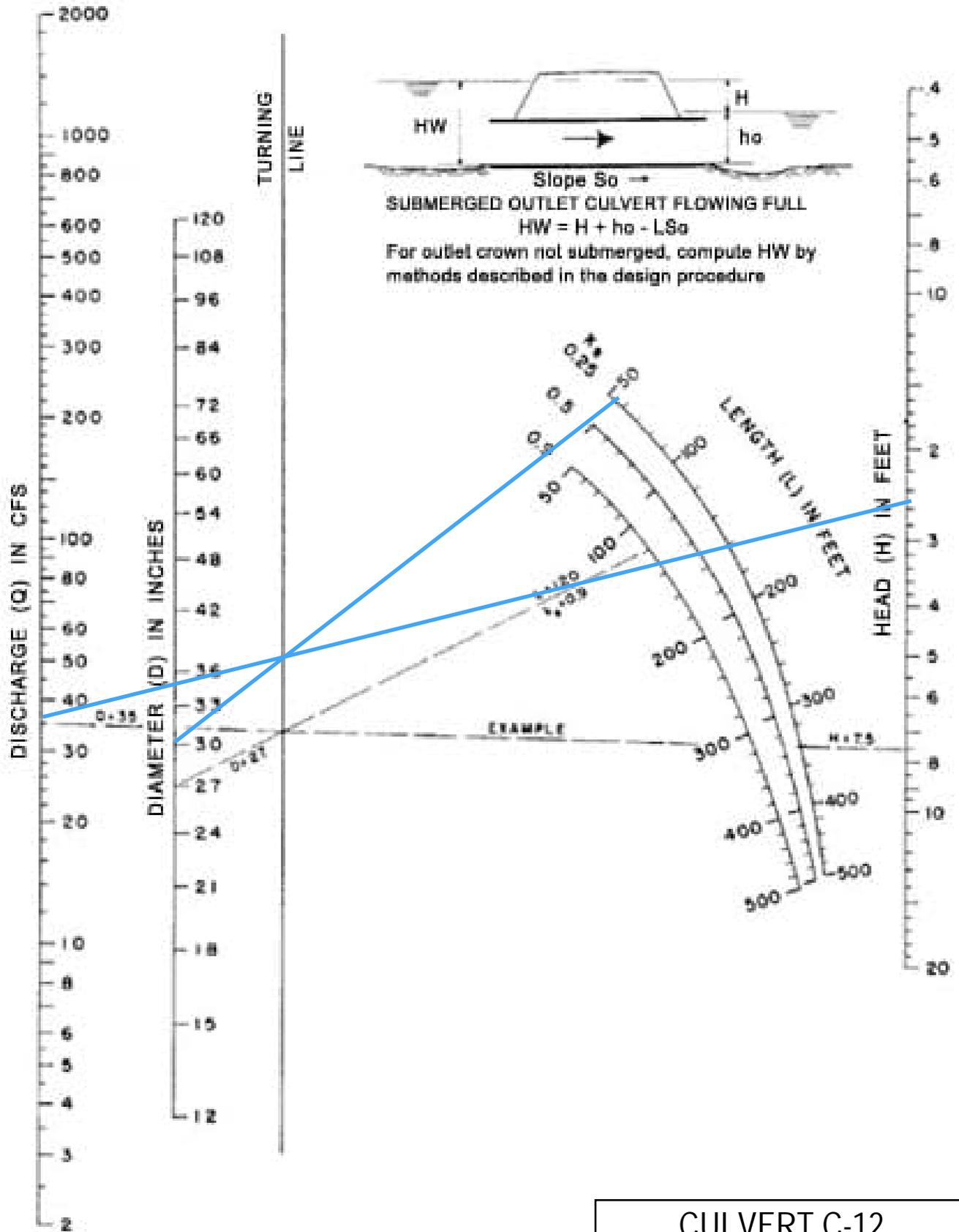


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JAN. 1964

CULVERT C-12
CRITICAL DEPTH
CIRCULAR PIPE

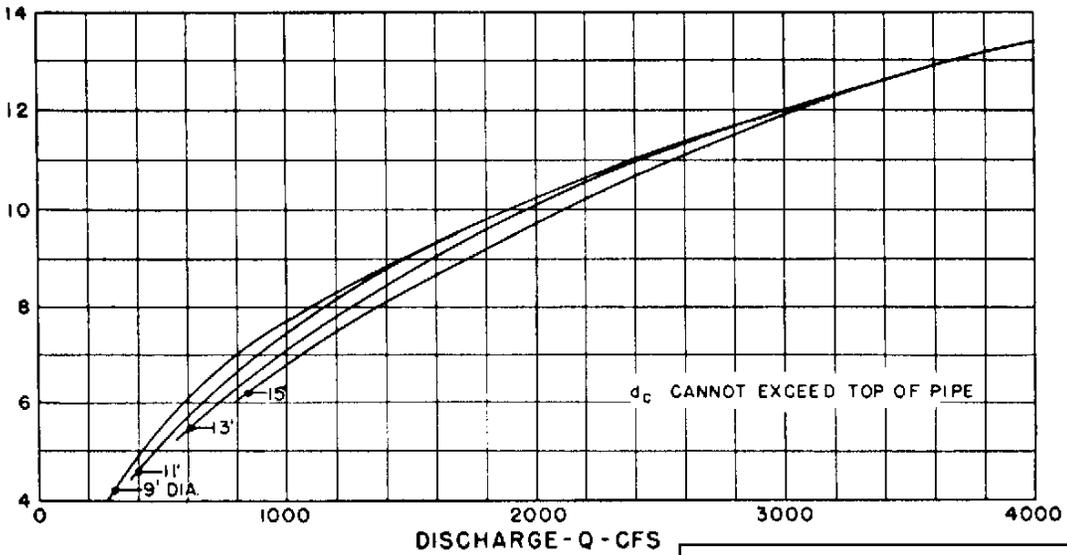
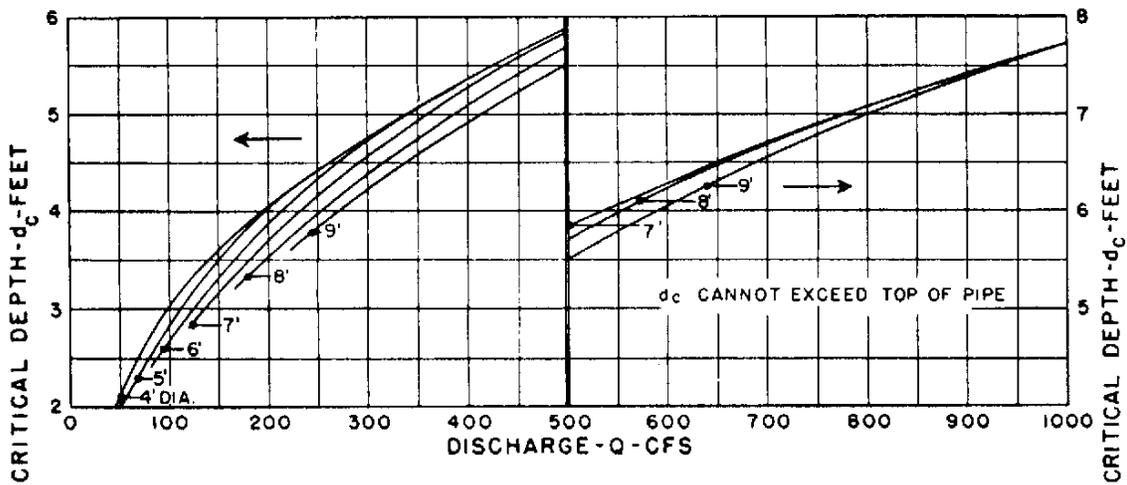
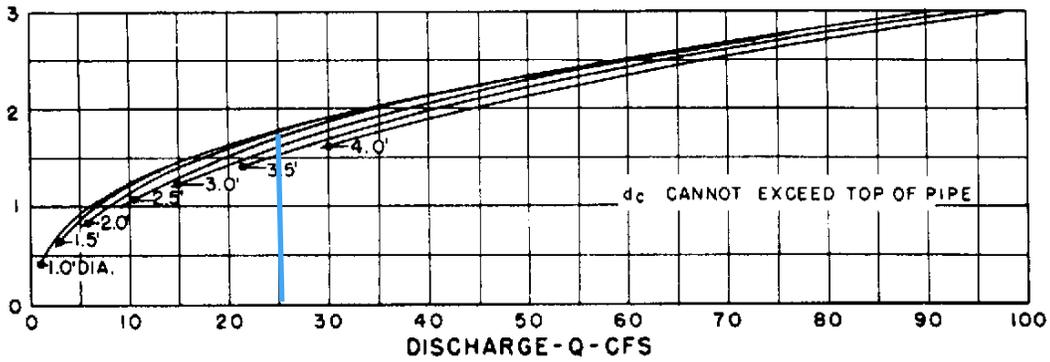


CULVERT C-12
HEADWATER DEPTH FOR
C. M. PIPE CULVERTS
WITH INLET CONTROL



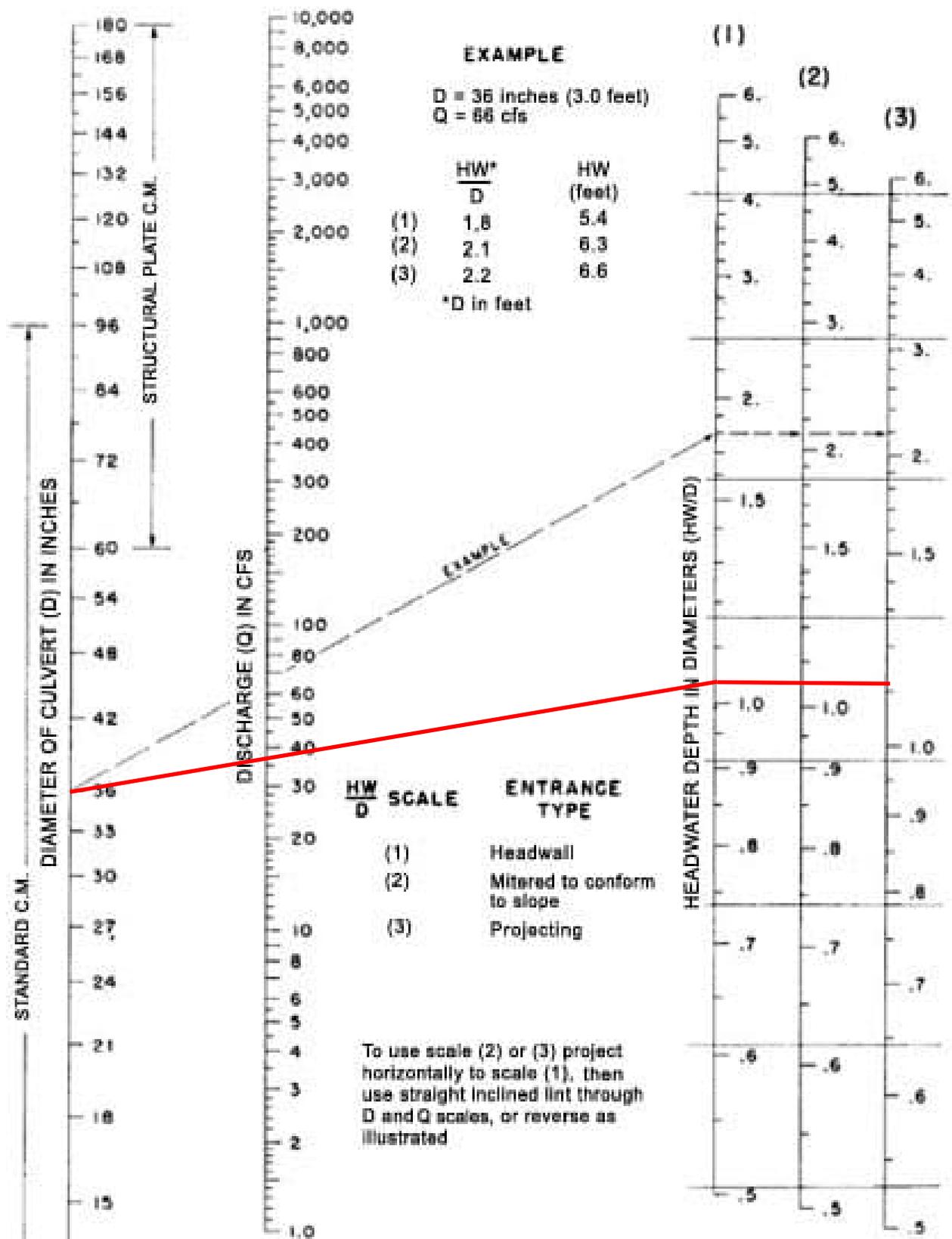
**CULVERT C-12
 HEAD FOR
 STANDARD
 G. M. PIPE CULVERTS
 FLOWING FULL
 $n = 0.024$**

CHART 4B

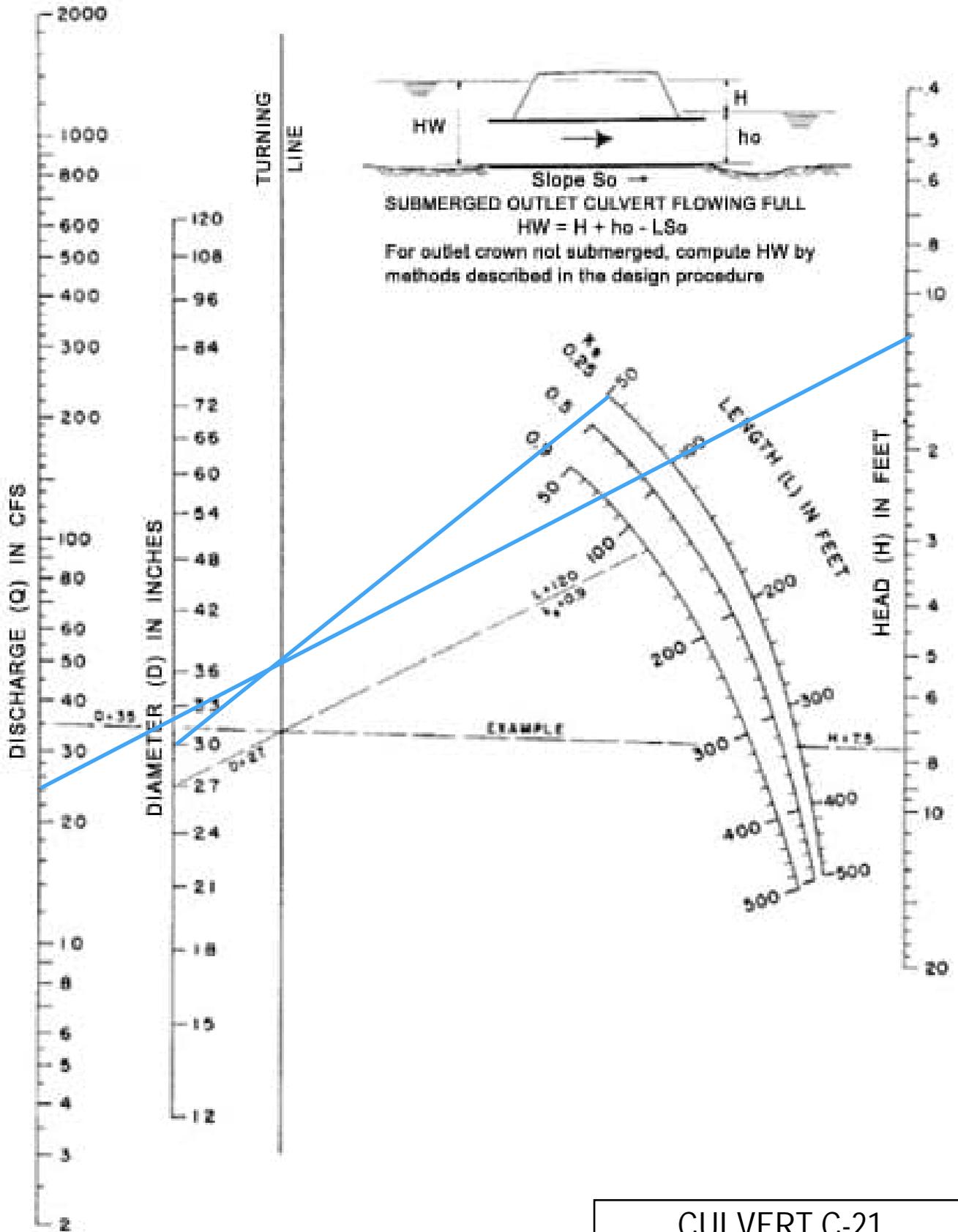


BUREAU OF PUBLIC ROADS
JAN. 1964

CULVERT C-12
CRITICAL DEPTH
CIRCULAR PIPE



**CULVERT C-21
 HEADWATER DEPTH FOR
 C. M. PIPE CULVERTS
 WITH INLET CONTROL**



CULVERT C-21
HEAD FOR
STANDARD
G. M. PIPE CULVERTS
FLOWING FULL
 $n = 0.024$

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Variance Request

Chambers County Industrial Landfill Lanett, Alabama

Prepared for:

Chambers County Landfill, LLC
West Point, Georgia



May 2024

Prepared by:

BROWNE
AND COMPANY, LLC
3312 Northside Drive • Building D, Suite 220
Macon, Georgia 31210 Ph/Fx: 478-743-4843

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

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May 16, 2024

Mr. Jared D. Kelly
Solid Waste Engineering Section, Land Division
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, Alabama 36130-1463

Re: Petition for Variance
Chambers County Landfill
Permit No. 09-02
Facility Permit Drawing Modifications

Dear Mr. Kelly

On behalf of Chambers County Landfill, LLC, we are submitting a request for a variance to the facility's operating permit. The modification is to

1. allow the final slopes to be 3H:1V instead of 4H:1V, and
2. allow the substitution of a Final Cover Diversion to be used instead of benches.

These proposed changes (will allow the operator to maximize the volume disposed within the permitted areas, are consistent with the grading plans submitted for review, and are landfill construction methods commonly used in other southeastern states. There are no other proposed changes to the plans at this time.

In accordance with ADEM's Solid Waste Program rules, 335-13-4-.20 (2) (c) 2. "The maximum final grade of the final cover system shall not exceed 25 percent or as specified by the Department to minimize erosion." According to the Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas, 2018 Edition, published by Alabama Soil and Water Conservation Committee, Chapter 1, the Factors Influencing Erosion are climate, topography, soils, and vegetative cover. Climate, soils and vegetative cover material is the same whether the slopes are 4H:1V or 3H:1V. The biggest impact will be topography, and Chapter 1 goes on to state "The longer the slope length and the steeper the slope gradient, the greater the potential for runoff, erosion and sediment delivery."

The design of the proposed cell final grades with 3H:1V slopes, with vertical spacing of 20 feet, results in a length of slope between the final cover diversions of 60 feet. If the slopes were 4H:1V, this same vertical spacing includes a slope length of 80 feet. The proposed design length of slope is approximately 33% shorter.

The design of the proposed cell final grades with 3H:1V slopes between terraces has a slope of 33.3%. If the slopes were 4H:1V, this same slope between terraces would be 25%. The proposed design slope is approximately 33% steeper. Since the slope length and slope gradient are the

Mr. Jared D. Kelly

May 16, 2024

Page 2

primary factors impacting erosion potential, for all intents and purposes, the erosive forces between each drainage terrace are equivalent for 3H:1V and 4H:1V slopes for this facility.

Previous demonstrations for similar variances at other facilities permitted through ADEM have shown that any difference in soil loss between the 3H:1V and 4H:1V designs is negligible, when the slopes are fully grassed or properly protected with mulch.

In support of these observations, we have **attached** a soil loss evaluation (USDA RUSLE method) for the 3H:1V slope. The calculated soil loss on the proposed slope is less than 2 tons per acre per year based at the time of construction, and will decrease as vegetation becomes more established.

A second **attachment** is a slope stability evaluation of the proposed a 3H:1V slope design. The evaluation demonstrates that the 3H:1V slope is stable. A narrative and stability calculation are attached.

The calculations indicate that the proposed modification will not cause stability or erosion concerns.

A check in the amount of \$1460.00 for the variance request is being transmitted under separate cover.

If you have any questions, please do not hesitate to call.

Sincerely,

Jeff Browne, P.E.
President
Browne and Company, LLC

John M. Gardner, P.E.
Sr. Project Manager
Smith Gardner, Inc.

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5687 9- (3.5: 2+4A.B8+CD)E
B8+- 4EG8987 8

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ADDRESS

14 N. Boylan Avenue, Raleigh, NC 27603

TEL

919.828.0577

WEB

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PROJECT Chambers County Landfill

SHEET 1 OF 2

DATE 4/11/2024

COMPUTED BY GGM

SUBJECT Evaluation of Erosion Potential

JOB # Chambers-24-1

CHECKED BY MMJ

OBJECTIVE: To determine the erosion potential of landfill slopes using the USDA Universal Soil Loss Equation.

REFERENCES: Lutton, R.J. (1982), "Evaluating Cover Systems for Solid and Hazardous Waste", U.S. Environmental Protection Agency, Technical Guidance Document, SW-867, pp. 37-41.

Ohio EPA (2005), "Selecting Material for Cap Protection Layers", Ohio EPA Guidance Document 0700, Columbus, Ohio.

Georgia Soil and Water Conservation Commission (2016), Manual for Erosion and Sediment Control in Georgia, Athens, GA.

USDA (1997), "Predicting Soil Loss by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE), via the Institute of Water Research, Michigan State University (iwr.msu.edu/rusle/)

ANALYSIS: Attached is the guidance as presented in EPA SW-867. A spreadsheet is used for the calculation of annual soil loss. Typically the maximum acceptable soil loss is no more than 5 tons per acre per year (Ohio EPA), but the attached calculations are based on a limit of 2 tons per acre per year.

PROJECT Chambers County landfill
SUBJECT Evaluation of Erosion Potential

SHEET 2/2
JOB # CHAMBERS-24-1
DATE 4/11/2024
COMPUTED BY GGM
CHECKED BY MMJ

Input Parameters:

Allowable Soil Loss (tons/acre/year) = 2.0
Soil Type = Gravelly, clay loam
Organic Content (%) = 0.5

Side Slopes:

Slope (%) = 33
Slope Length (ft) = 60

R = 217 US EPA Erosivity Factor Calculator (<https://lew.epa.gov/>)
K (tons/acre) = 0.20 USDA Web Soil Survey (weighted Average, site and borrow area)
LS = 4.2 USDA Agricultural Handbook No. 703
C = 0.01 (Table 7) Poor grass - conservative estimate (USDA No. 703)
P = 1.0 (Table 8) Good practice (USDA No. 703)

Average Annual Soil Loss (tons/acre) = O.K.

Top Slopes:

Slope (%) = 5
Slope Length (ft) = 60

R = 217 US EPA Erosivity Factor Calculator (<https://lew.epa.gov/>)
K (tons/acre) = 0.15 USDA Web Soil Survey
LS = 0.58 USDA Agricultural Handbook No. 703
C = 0.01 (Table 7) Poor grass - conservative estimate (USDA No. 703)
P = 1.0 (Table 8) Good practice (USDA No. 703)

Average Annual Soil Loss (tons/acre) = O.K.

The potential loss from erosion for newly placed soil on the final cover is acceptable. The loss rate is expected to decline as vegetation is established.

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1 Select the estimated start and end dates of construction by clicking the calendar icons below and using the dropdown calendar. The period of construction activity begins at initial earth disturbance and ends with final stabilization.

Start Date:

05/01/2024

End Date:

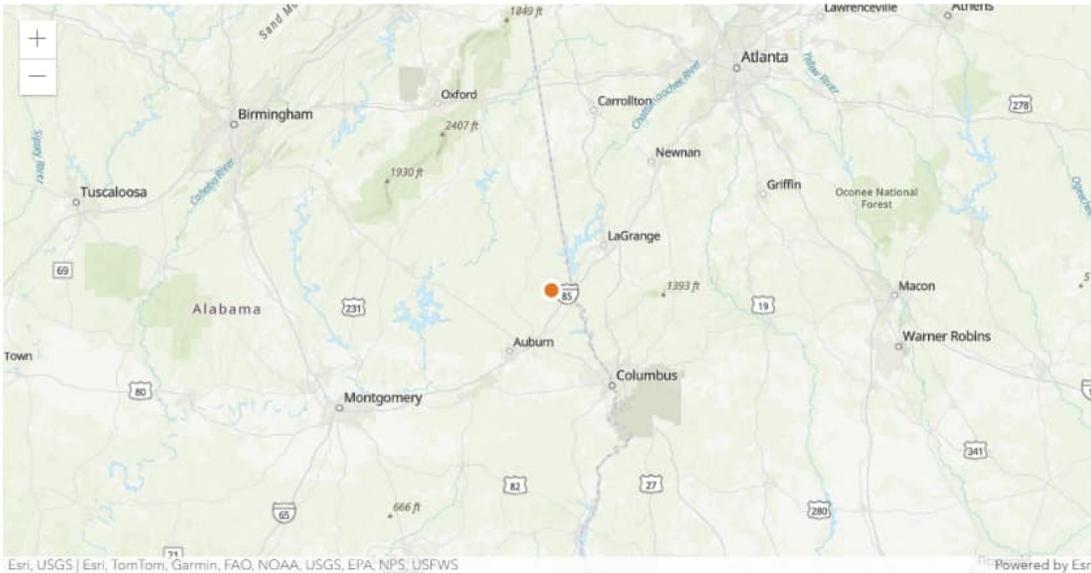
10/30/2024

2 Locate your small construction project by entering the address in the search box or by clicking on the map.

Location:

7245 Veterans Memorial Pkwy Lanett, AL 36863

Search



3 Click the "Calculate R Factor" button below.

Calculate R Factor

Facility Information

| | |
|------------------------|---------------------|
| Start Date: 05/01/2024 | Latitude: 32.8585 |
| End Date: 10/30/2024 | Longitude: -85.2828 |

Calculation Results

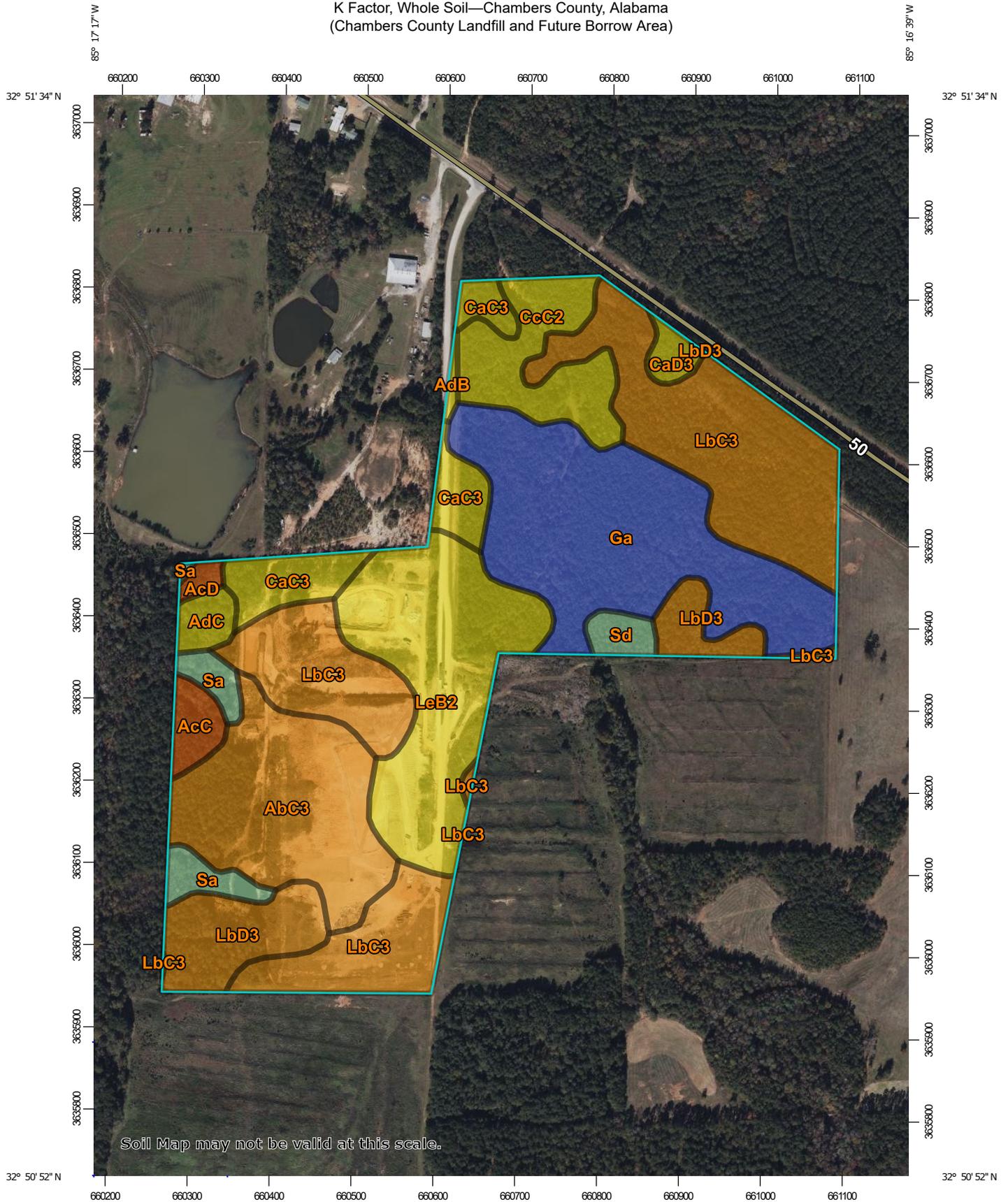
Rainfall erosivity factor (R Factor) = **217**

A rainfall erosivity factor of 5.0 or greater has been calculated for your site's period of construction.

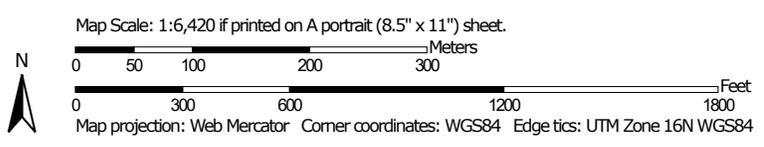
You do NOT qualify for a waiver from NPDES permitting requirements and must seek Construction General Permit (CGP) coverage. If you are located in an [area where EPA is the permitting authority \(pdf\)](#), you must submit a Notice of Intent (NOI) through the [NPDES eReporting Tool \(NeT\)](#). Otherwise, you must seek coverage under your state's CGP.



K Factor, Whole Soil—Chambers County, Alabama
(Chambers County Landfill and Future Borrow Area)



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

| | |
|---|----------------------------|
|  | .02 |
|  | .05 |
|  | .10 |
|  | .15 |
|  | .17 |
|  | .20 |
|  | .24 |
|  | .28 |
|  | .32 |
|  | .37 |
|  | .43 |
|  | .49 |
|  | .55 |
|  | .64 |
|  | Not rated or not available |

Soil Rating Lines

| | |
|---|-----|
|  | .02 |
|  | .05 |
|  | .10 |
|  | .15 |
|  | .17 |
|  | .20 |

| | |
|---|----------------------------|
|  | .24 |
|  | .28 |
|  | .32 |
|  | .37 |
|  | .43 |
|  | .49 |
|  | .55 |
|  | .64 |
|  | Not rated or not available |

Soil Rating Points

| | |
|---|----------------------------|
|  | .02 |
|  | .05 |
|  | .10 |
|  | .15 |
|  | .17 |
|  | .20 |
|  | .24 |
|  | .28 |
|  | .32 |
|  | .37 |
|  | .43 |
|  | .49 |
|  | .55 |
|  | .64 |
|  | Not rated or not available |

Water Features

| | |
|---|---------------------|
|  | Streams and Canals |
| Transportation | |
|  | Rails |
|  | Interstate Highways |
|  | US Routes |
|  | Major Roads |
|  | Local Roads |
| Background | |
|  | Aerial Photography |

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chambers County, Alabama
Survey Area Data: Version 17, Sep 11, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 26, 2021—Dec 22, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

K Factor, Whole Soil

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|------------------------------------|---|--------|--------------|----------------|
| AbC3 | Appling gravelly sandy clay loam, severely eroded, sloping | .10 | 12.2 | 12.9% |
| AcC | Appling gravelly sandy loam, sloping | .05 | 1.4 | 1.5% |
| AcD | Appling gravelly sandy loam, strongly sloping | .05 | 0.5 | 0.5% |
| AdB | Appling sandy loam, 2 to 6 percent slopes | .17 | 0.3 | 0.3% |
| AdC | Appling sandy loam, 6 to 10 percent slopes | .17 | 1.2 | 1.2% |
| CaC3 | Cecil gravelly clay loam, severely eroded, sloping | .17 | 5.0 | 5.3% |
| CaD3 | Cecil gravelly clay loam, severely eroded, strongly sloping | .17 | 0.9 | 0.9% |
| CcC2 | Cecil sandy loam, 6 to 10 percent slopes, moderately eroded | .17 | 6.1 | 6.4% |
| Ga | Gullied land | .49 | 18.4 | 19.6% |
| LbC3 | Lloyd gravelly clay loam, severely eroded, sloping | .10 | 24.7 | 26.3% |
| LbD3 | Lloyd gravelly clay loam, severely eroded, strongly sloping | .10 | 6.5 | 6.9% |
| LeB2 | Lloyd sandy loam, eroded, gently sloping | .17 | 13.8 | 14.7% |
| Sa | Sandy alluvial land, poorly to somewhat poorly drained | .28 | 2.2 | 2.4% |
| Sd | Starr soils | .28 | 1.0 | 1.1% |
| Totals for Area of Interest | | | 94.0 | 100.0% |

Description

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Factor K does not apply to organic horizons and is not reported for those layers.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)



LS Table for Construction Sites

- > [Home](#)
- > [About RUSLE](#)
- > [Erosion Factors](#)
- > [Calculate Erosion](#)
- > [Resources](#)
- > [Contact Us](#)
- > [Acknowledgement](#)

The following table shows LS factors for freshly prepared constructed and other highly disturbed soil condition with little or no cover (not applicable to thawing soil)

| Slope (%) | Slope Length (ft.) | | | | | | | | | | | | | | | | | |
|-----------|--------------------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| | <3 | 6 | 9 | 12 | 15 | 25 | 50 | 75 | 100 | 150 | 200 | 250 | 300 | 400 | 600 | 800 | 1000 | |
| 0.2 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | |
| 0.5 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.08 | 0.08 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.11 | 0.12 | 0.12 | 0.13 | |
| 1.0 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.13 | 0.14 | 0.15 | 0.17 | 0.18 | 0.19 | 0.20 | 0.22 | 0.24 | 0.26 | 0.27 | |
| 2.0 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.16 | 0.21 | 0.25 | 0.28 | 0.33 | 0.37 | 0.40 | 0.43 | 0.48 | 0.56 | 0.63 | 0.69 | |
| 3.0 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.21 | 0.30 | 0.36 | 0.41 | 0.50 | 0.57 | 0.64 | 0.69 | 0.80 | 0.96 | 1.10 | 1.23 | |
| 4.0 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.26 | 0.38 | 0.47 | 0.55 | 0.68 | 0.79 | 0.89 | 0.98 | 1.14 | 1.42 | 1.65 | 1.86 | |
| 5.0 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.31 | 0.46 | 0.58 | 0.68 | 0.86 | 1.02 | 1.16 | 1.28 | 1.51 | 1.91 | 2.25 | 2.55 | |
| 6.0 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.36 | 0.54 | 0.69 | 0.82 | 1.05 | 1.25 | 1.43 | 1.60 | 1.90 | 2.43 | 2.89 | 3.30 | |
| 8.0 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.45 | 0.70 | 0.91 | 1.10 | 1.43 | 1.72 | 1.99 | 2.24 | 2.70 | 3.52 | 4.24 | 4.91 | |
| 10.0 | 0.35 | 0.37 | 0.38 | 0.39 | 0.40 | 0.57 | 0.91 | 1.20 | 1.46 | 1.92 | 2.34 | 2.72 | 3.09 | 3.75 | 4.95 | 6.03 | 7.02 | |
| 12.0 | 0.36 | 0.41 | 0.45 | 0.47 | 0.49 | 0.71 | 1.15 | 1.54 | 1.88 | 2.51 | 3.07 | 3.60 | 4.09 | 5.01 | 6.67 | 8.17 | 9.57 | |
| 14.0 | 0.38 | 0.45 | 0.51 | 0.55 | 0.58 | 0.85 | 1.40 | 1.87 | 2.31 | 3.09 | 3.81 | 4.48 | 5.11 | 6.30 | 8.45 | 10.40 | 12.23 | |
| 16.0 | 0.39 | 0.49 | 0.56 | 0.62 | 0.67 | 0.98 | 1.64 | 2.21 | 2.73 | 3.68 | 4.56 | 5.37 | 6.15 | 7.60 | 10.26 | 12.69 | 14.96 | |
| 20.0 | 0.41 | 0.56 | 0.67 | 0.76 | 0.84 | 1.24 | 2.10 | 2.86 | 3.57 | 4.85 | 6.04 | 7.16 | 8.23 | 10.24 | 13.94 | 17.35 | 20.57 | |
| 25.0 | 0.45 | 0.64 | 0.80 | 0.93 | 1.04 | 1.56 | 2.67 | 3.67 | 4.59 | 6.30 | 7.88 | 9.38 | 10.81 | 13.53 | 18.57 | 23.24 | 27.66 | |
| 30.0 | 0.48 | 0.72 | 0.91 | 1.08 | 1.24 | 1.86 | 3.22 | 4.44 | 5.58 | 7.70 | 9.67 | 11.55 | 13.35 | 16.77 | 23.14 | 29.07 | 34.71 | |
| 40.0 | 0.53 | 0.85 | 1.13 | 1.37 | 1.59 | 2.41 | 4.24 | 5.89 | 7.44 | 10.35 | 13.07 | 15.67 | 18.17 | 22.95 | 31.89 | 40.29 | 48.29 | |
| 50.0 | 0.58 | 0.97 | 1.31 | 1.62 | 1.91 | 2.91 | 5.16 | 7.20 | 9.13 | 12.75 | 16.16 | 19.42 | 22.57 | 28.60 | 39.95 | 50.63 | 60.84 | |
| 60.0 | 0.63 | 1.07 | 1.47 | 1.84 | 2.19 | 3.36 | 5.97 | 8.33 | 10.63 | 14.89 | 18.92 | 22.78 | 26.51 | 33.67 | 47.18 | 59.93 | 72.15 | |

(From: USDA Agricultural Handbook No. 703).

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Interpolation of LS
33% slope and
60 ft slope length

LS = 4.21

Table 11. Typical slope-length (LS) and erodibility (K) factors for some soil and slope conditions and calculated RKLS values of the USLE.

| Tillage and cropping practice | Crop sequence† | USLE Factors | | |
|-------------------------------------|------------------|--------------|-----|--------|
| | | C | P | CxP |
| Forest | (permanent) | 0.0005 | 1 | 0.0005 |
| Pasture‡ | (permanent) | 0.005 | 1 | 0.005 |
| Rotation (1/6)‡ | C-G-M-M-M-M | 0.011 | 1 | 0.011 |
| Rotation (2/5) | C-S-G-M-M | 0.027 | 1 | 0.027 |
| No-till, cover crop after soybeans‡ | C-S (cover crop) | 0.027 | 1 | 0.027 |
| No-till‡ | C-S | 0.050 | 1 | 0.050 |
| Ridge-till planting | C-S | 0.10 | 1 | 0.10 |
| Chisel (50% residue) on contour | C-S | 0.16 | 0.5 | 0.08 |
| Chisel (50% residue) and no-till | C-S | 0.10 | 1 | 0.10 |
| Chisel tillage (50% residue) | C-S | 0.16 | 1 | 0.16 |
| Chisel tillage (little residue) ‡ | C-S | 0.35 | 1 | 0.35 |
| Moldboard plow, spring‡ | C-S | 0.35 | 1 | 0.35 |
| Moldboard plow, fall‡ | C-S | 0.39 | 1 | 0.39 |
| Bare soil | none | 1.00 | 1 | 1.00 |

† C - Corn, M - meadow (forage crop); G - small grain; S -- soybeans

‡ Practice described in Chapter III. The last three entries in the table are included in "Clean Tillage."

Franzmeier, Donald P. and Gary C. Steinhardt, "Indiana Soils: Evaluation and Conservation", (On-line manual), Perdue University, West Lafayette, Indiana, September 2009.

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14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



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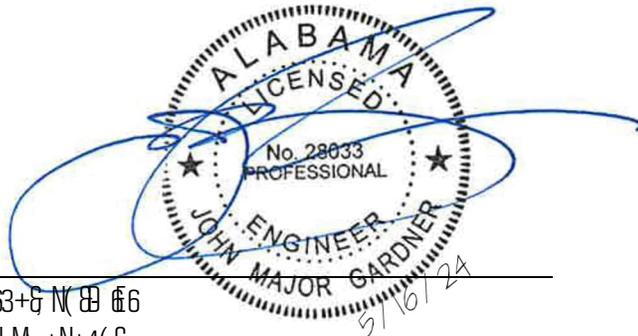
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| Figure 2 | Slope Stability Sections Base Grades |
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APPENDICES

| | |
|------------|--------------------------|
| Appendix A | Slope Stability Analyses |
|------------|--------------------------|

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This report summarizes evaluations of the stability of the overall waste mass and perimeter for the Western Expansion of the Chambers County Landfill near Lanett, Alabama. The proposed expansion includes a variance request to construct the exterior final cover with 3H:1V slopes with final cover diversion berms placed approximately 20 feet apart (vertically), creating an effective horizontal slope length of 60 feet. This report does not address the proposed final cover ("veneer stability") since the cover is comprised of soil layers, with no apparent slip planes. Consequently, only "deep seated" failure surfaces are addressed in the evaluation. Foundation settlement was not deemed an issue, as the site does not have a leachate collection system or other features that would be adversely affected by differential settlement.

RM g3,S3eCeSi,GL j,H G h3,j 3 7c g hgeL

Based on information provided by Browne and Company, LLC, Bunnell Lammons Engineering Company, and soil mapping from the U.S. Department of Agriculture Natural Resource Conservation Corps, the Sylvan Springs Landfill is located within the *Central Piedmont* area of Alabama. In the area of the Western Expansion, the pre-development ground surface generally falls from the west side adjacent to the operating landfill to the eastern property boundary and an adjacent stream. Groundwater generally flows to the west as well, ranging from about 20 feet below the predevelopment ground surface on the eastern side (nearest the operating landfill) and is 5 feet below the pre-development ground surface along the western limits of the expansion.

The site is permitted to receive industrial waste. However, the wastes accepted at the site are generally construction and demolition (C&D) wastes, with only a small percentage of industrial waste. No sludge or otherwise weak material is known to be included in any industrial waste accepted at the site, and it is our understanding that none is planned in the future. Consequently, no "weak layers" are reflected in the waste properties used in the stability analyses.

There are no geosynthetics proposed or required for the base or final cover layers at the site.

If the waste properties change from those assumed above, or if geosynthetics are added to the base or cover, this analysis will require revision.

l M 3g U g7,7eL g 3cGhgeL

The EPA does not have seismic guidance for C&D or industrial landfills. The site is not in a seismic impact zone, as the Peak Ground Acceleration (PGA) is less than 0.10 g according to USGS (Peterson et. al, 2014) (see **Figure 1**) and, seismic (pseudo-static) slope stability analyses were evaluated.

1M +1B: 1Y,7(+EEY1+6-B

The peak bedrock acceleration at the site is obtained from 2014 USGS information (Peterson et. al). The information projects indicates that a peak bedrock acceleration of 0.068 g can be assigned to the site based on the site latitude (32.85 degrees) and longitude (-85.25 degrees).

Based on the EPA guidance methods for evaluating the seismic response of MSW landfills (Richardson et al., 1995), one half of the peak ground acceleration is used in the seismic analyses. This reduction in the PGA is recommended by the guidance document to account for the relatively broad width of the landfill base compared to the size of the accelerating earthquake wave. Therefore, seismic acceleration of 0.034g was used in the pseudo-static (i.e., seismic) analyses.

VM U Gh3cgc,| cel 3chg3

A summary of material properties used in the evaluation of deep-seated failure surfaces is presented in **Table 1**. A discussion of these values is as follows:

VM 50TA D+, (18m

Based on boring logs from BLE, the subgrade soils were assumed to be loose and medium density sand. Using charts (**Figures 2 and 3**) from the California Department of Transportation (Caltrans 2021) to correlate Standard Penetration Test blow counts with friction and moist unit weight, the properties assumed for the in-situ soils were:

Medium Sands

| | |
|-----------------------|--------------------------------------|
| Unit Weight: | 108 pcf (moist), 120 pdf (saturated) |
| Cohesion: | 0 psf |
| Friction Angle (phi): | 30 degrees |

Loose Sands

| | |
|-----------------------|------------------------------------|
| Unit Weight: | 94pcf (moist), 115 pdf (saturated) |
| Cohesion: | 0 psf |
| Friction Angle (phi): | 27 degrees |

VM I +At: +-+AW+A Bm

The assumed material properties for the perimeter berms/subgrade are:

| | |
|-----------------------|-----------------|
| Unit Weight: | 120 pcf (moist) |
| Cohesion: | 100 psf |
| Friction Angle (phi): | 25 degrees |

These properties are conservative as compared to typical soil strength properties of compacted fill (NAVFAC DM 7.02). The perimeter berm is a small fraction of the material in the analysis, waste is generally placed directly against excavated subgrade. Both the subgrade and the perimeter berms are reasonably expected to have strength properties greater than those assumed in the analyses.

VM H. B-+m

The assumed material properties for the C&D Waste are:

| | |
|-----------------------|----------------|
| Unit Weight: | 65 pcf (moist) |
| Cohesion (c): | 0 psf |
| Friction Angle (phi): | 28 degrees |

The assumed unit weight is based an estimated average density of about 0.5 tons of waste per cubic yard of airspace, The assumed shear strength envelope (cohesion and friction angle values) is based on values published by Konstantopoulou and Spanou (2013), who reported C&D waste as typically having a friction angle of 34 degrees with no cohesion. The selected friction angle used in the analyses is conservative when compared to the value identified by Konstantopoulou and Spanou, and is conservative based on past experience with typical C&D and industrial landfills that do accept sludge.

nM Cel 3, hGWGchi

The stability of potential failure surfaces was evaluated based on EPA guidance for municipal solid waste (MSW) landfills and standard industry practices, as there are no published EPA guidance methods for evaluating the stability of C&D landfills.

nM c+051A+D,p Y-(AB,(E . E+2

The minimum acceptable factors of safety for long-term slope stability were selected to be:

- 1.5 for static conditions and
- 1.0 for seismic conditions.

Interim slopes at the site are designed at 3H:1V which is identical to the final slope configuration. The critical interim and final slopes analyzed were selected as the critical cases based on the greatest waste thickness. One interim fill slope and one final slope are evaluated in this report. The locations of the slopes evaluated are shown in **Figure 2** (Base Grades) and **Figure 3** (Final Grades).

nM j++) P +. -+D,p. 1&A+, 5AE Y+B

The stability of deep-seated failure surfaces was evaluated using the computer program Slide (v. 6.0), developed by Roc Science. Both block (translational failure plane) and circular (rotational within waste mass and/or subgrade) failure surfaces were analyzed. Block and circular failure methods were analyzed using the Spencer method which balances lateral forces and rotational forces. Complete results are presented for these analyses in **Appendix A**.

nM 9. 8q ,p. 1&A+, 5AE Y+B

The final cover system does not contain any geosynthetics, so no shallow failure analysis was judged to be needed.

nM c+B5&B

Table 2 provides a summary of the results of the stability analyses for deep-seated failure surfaces. The results demonstrate that minimum factors of safety for both static and seismic conditions meet or exceed the minimum criteria (1.5 for final static conditions and 1.0 for seismic conditions). These analyses are presented in **Appendix A**.

rM 7eL 7Cs 9L

Based on the analyses presented in this report, the proposed modification to the final cover slope (i.e., 3H:1V slopes) is stable in both static and seismic conditions.

Browne and Company, LLC, (2023) "Renewal Application, Chambers County Landfill, "Permit No. 09-02..

Bunnell-Lammons Engineering, Inc., (2024), Boring logs for groundwater contours from "Chambers County Limited Hydro" BLE project number J23-18020-02.

California Department of Transportation (2021), Geotechnical Manual," from the Caltrans Division of Engineering Services, Geotechnical Services "
(<https://dot.ca.gov/programs/engineering-services/manuals/geotechnical-manual>).

Konstantopoulou, G & Spanou, Natalia. (2013). Stability analysis of construction and demolition waste (CDW) deposits in the abandoned quarry of Profitis Ilias, Kozani, Greece.. Bulletin of the Geological Society of Greece. 47. 1706. 10.12681/bgsg.11035.

Krinitzsky, E.L., Gould, J.P., and P.H. Edinger (1993), Fundamentals of Earthquake-Resistant Construction, John Wiley & Sons, New York.

Naval Facilities Engineering Command (1986), Foundations and Earth Structures (Design Manual 7.02), Naval Facilities Engineering Command, Alexandria, VA, p. 7.2-39.

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Seed, H.B. and Idriss, I.M. (1982), "Ground Motions and Soil Liquefaction During Earthquakes," Monograph No. 5, Earthquake Engineering Research Institute, Berkeley, California.

U.S. Army Corps of Engineers (2003), Engineering and Design - Slope Stability, Engineer Manual, EM 1110-2-1902, Dept. of the Army, Washington, D.C.

Table 1: Material Properties Used in Slope Stability Analyses

| Material | Unit Weight (pcf) | | Shear Strength Properties ¹ | |
|-----------------|-------------------|-----------|--|---|
| | Moist | Saturated | Cohesion/ Adhesion (c) (psf) | Friction Angle (ϕ) (degrees) |
| Perimeter Berms | 120 (Moist) | | 100 | 25 |
| Medium Sand | 108 | 120 | 0 | 30 |
| Loose Sand | 94 | 115 | 0 | 27 |
| Waste (C&D) | 65 (Moist) | | 0 | 28 |

Notes:

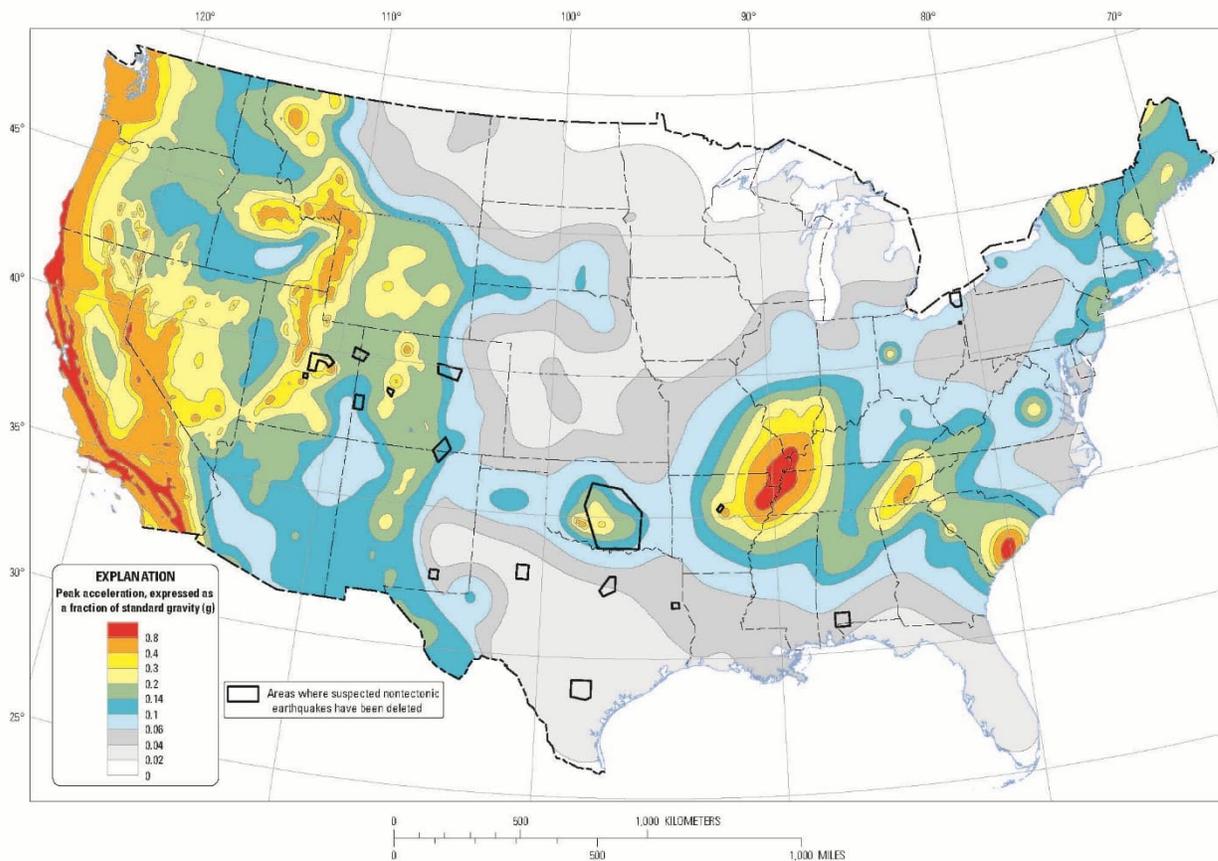
1. Combinations of cohesion/adhesion and friction angle that are different than these values that produce the same shear strength could also be used here (shear strength (τ) = normal load x $\tan(\phi) + c$).

Table 2: Results Summary - Deep-Seated Failure Surfaces

| Cross Section Analyzed | Failure Type | Analysis Method | Factor of Safety ¹ | |
|------------------------|---------------------------|-----------------|-----------------------------------|---|
| | | | Static (FS \geq 1.5 - Final) | Seismic ² (FS \geq 1.0) |
| C-C | Block through Subgrade | Spencer | 1.67 | 1.50 |
| | Circular through Subgrade | Spencer | 1.71 | 1.53 |
| | Block through Waste | Spencer | 1.60 | 1.43 |
| | Circular through Waste | Spencer | 1.60 | 1.44 |

Notes:

1. See **Table 1** for material properties used in each run.
2. Seismic coefficient used in the evaluation (k_s) = 0.0.0347 g



Two-percent probability of exceedance in 50 years map of peak ground acceleration

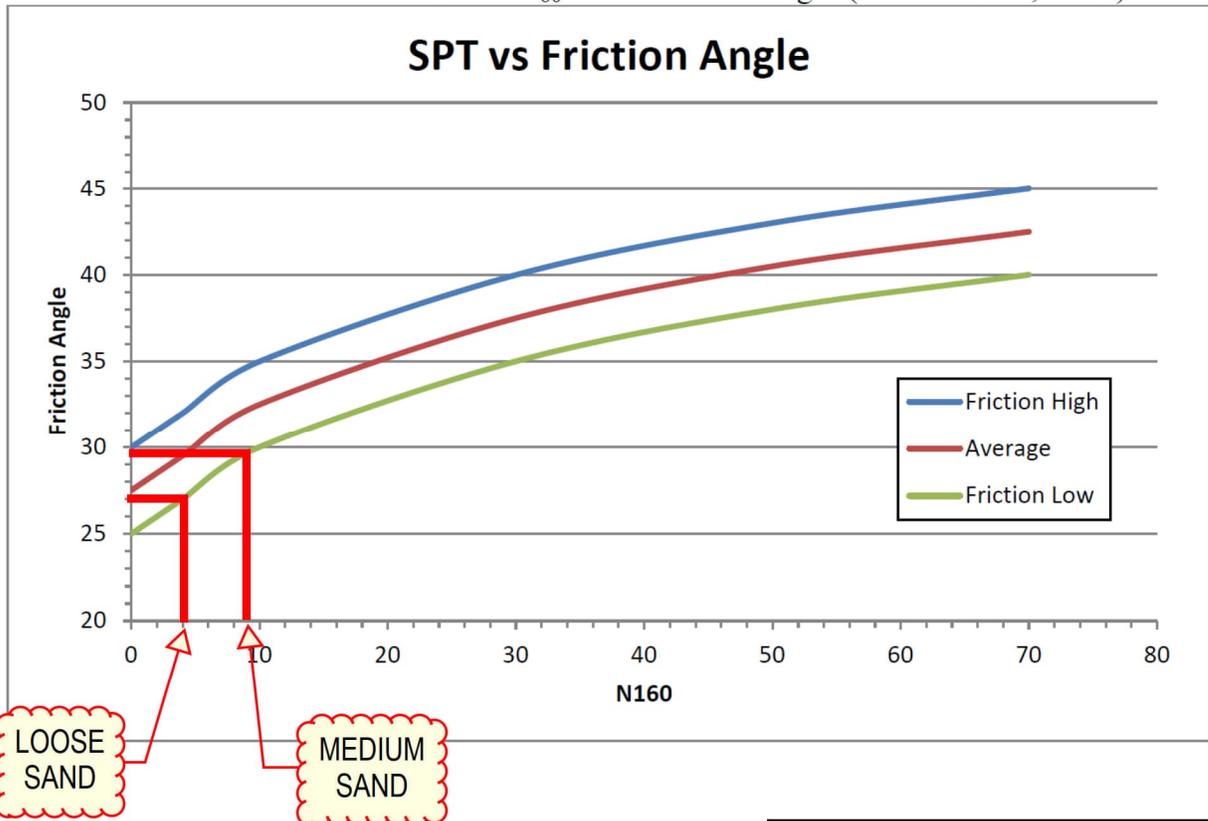
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SMITH+GARDNER

| | | | | | |
|--------------------------|------------------------|---------------------|-------------------|----------------------------------|-----------------|
| 8(+), - . 010. 1 8(+) | 23(4 - 156, . 0: +3 | 8: +6A+2156, BBC | 2(0+, C DE1FGH | 13. J+60F . K 8: (C 5+3 LFHLM | NBP3+7 . K M |
|--------------------------|------------------------|---------------------|-------------------|----------------------------------|-----------------|

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Chart 1: Correlation of SPT N_{160} with Friction Angle (after Bowles, 1977)

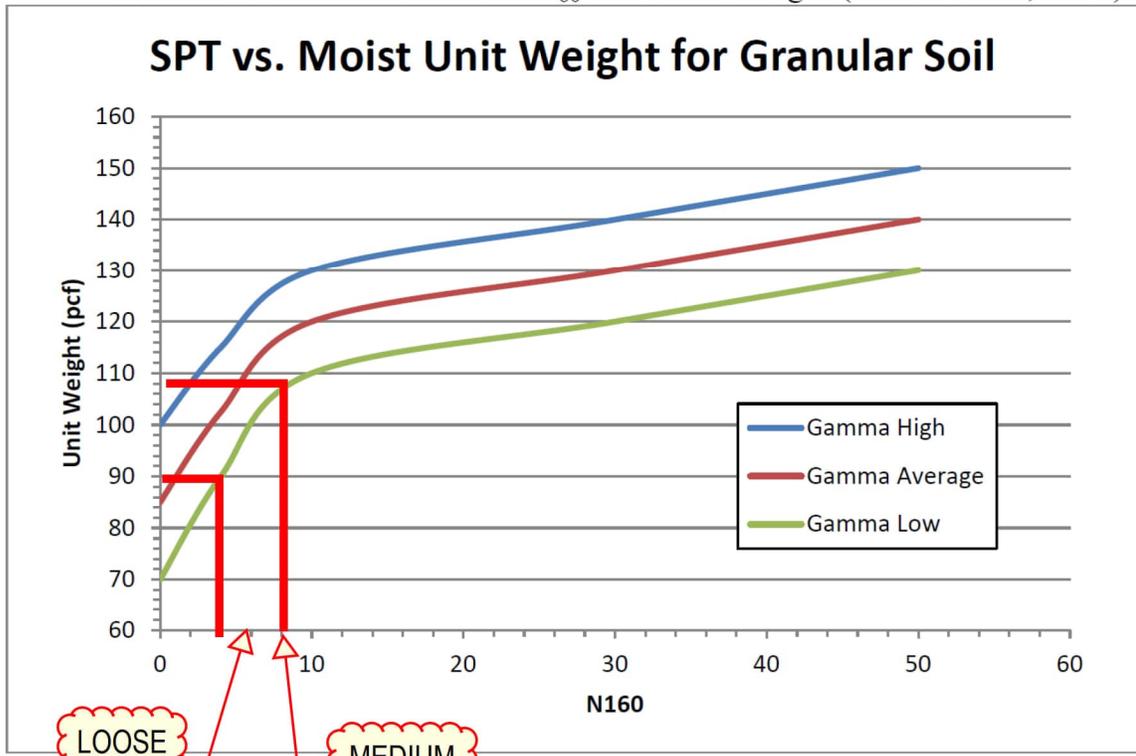


Ref. Caltrans Geotechnical Manual, Soil Correlations, March 2021

| | | | | | |
|---|------------------------|---------------------|------------------------|-----------------------------------|-----------------|
| 861 741 34)5+7+6316,97)6+86 . 933+:16,97)69)A3., 6,97)17(:+ . 1: 63176)BCBD | | | <h1>SMITH+GARDNER</h1> | | |
| 8(+), - . 00. 1 8(+) | 23(4 - 156, . 0: +3 | 8: +6A+2156, BBC | 2(0+, C (61FGFH | 1 3. J+80+ . K 8: (C 5+3 LFHLM | NBP3+1 . K F |

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Chart 2: Correlation of SPT N_{160} with Unit Weight (after Bowles, 1977).



Ref. Caltrans Geotechnical Manual, Soil Correlations, March 2021

| | | | | | |
|---|------------------------|---------------------|----------------------|----------------------------------|-----------------|
| 861 741 34)5+7+6316,97)6+86 . 933+:16,97)69) 9,86)4+78,6E . 1: 63178)BCBD | | | SMITH+GARDNER | | |
| 8(+), - . 010. 1 8(+) | 23(4 - 156, . 0: +3 | 8: +8A+2156, BBC | 2(0+, C (61FGFH | 13. J+801 . K 8: (C 5+3 LFHLM | NBP3+1 . K R |

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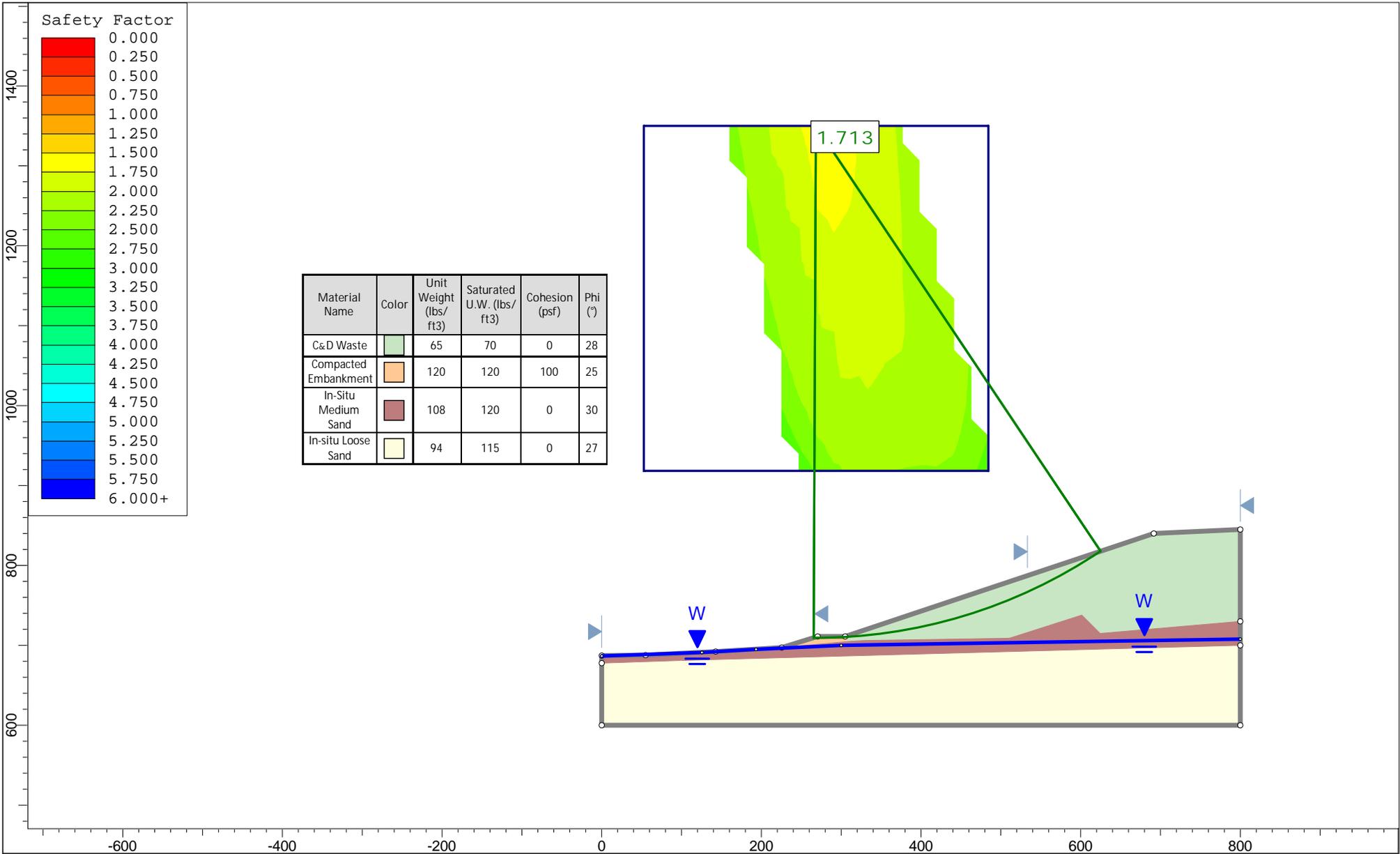
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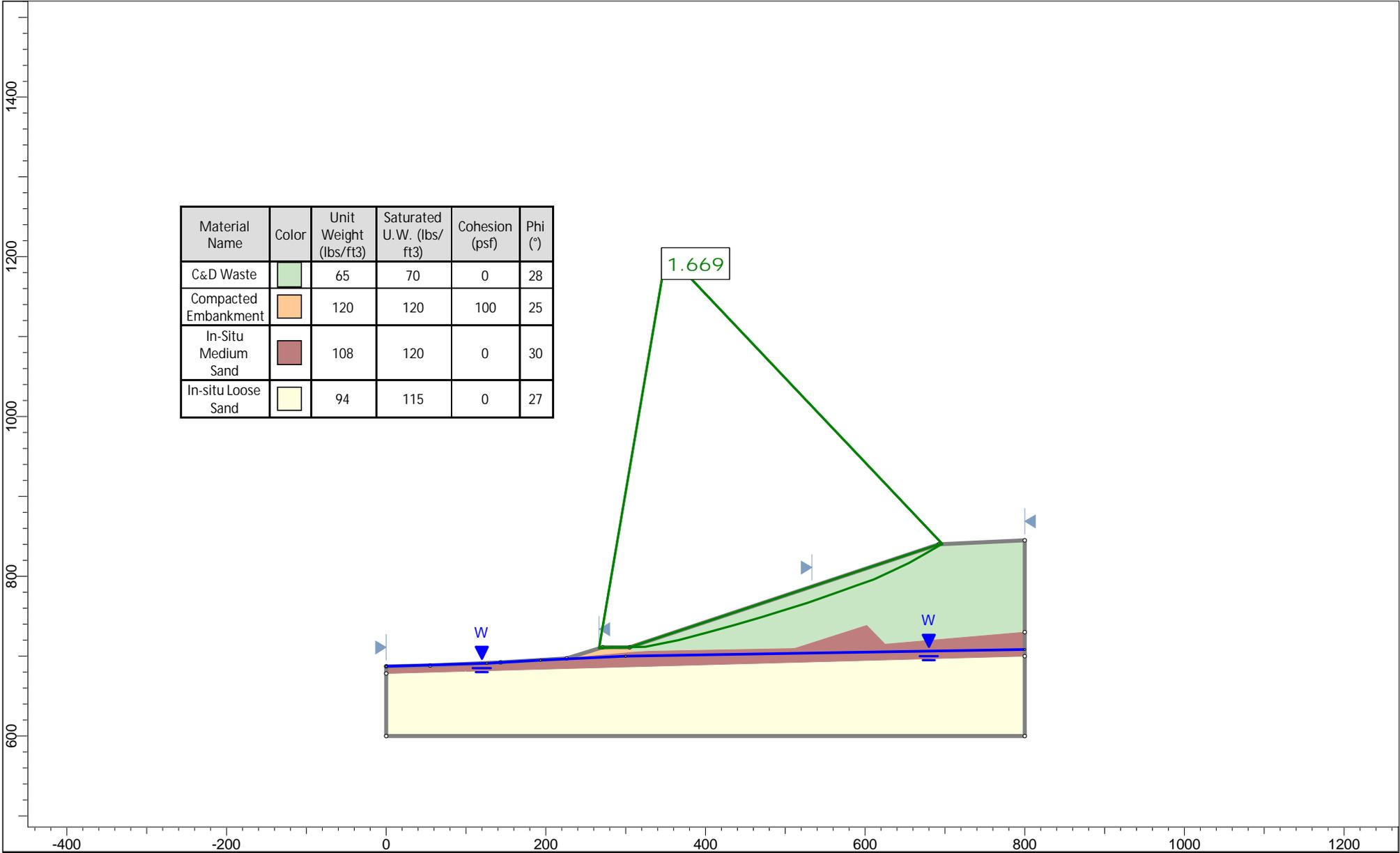
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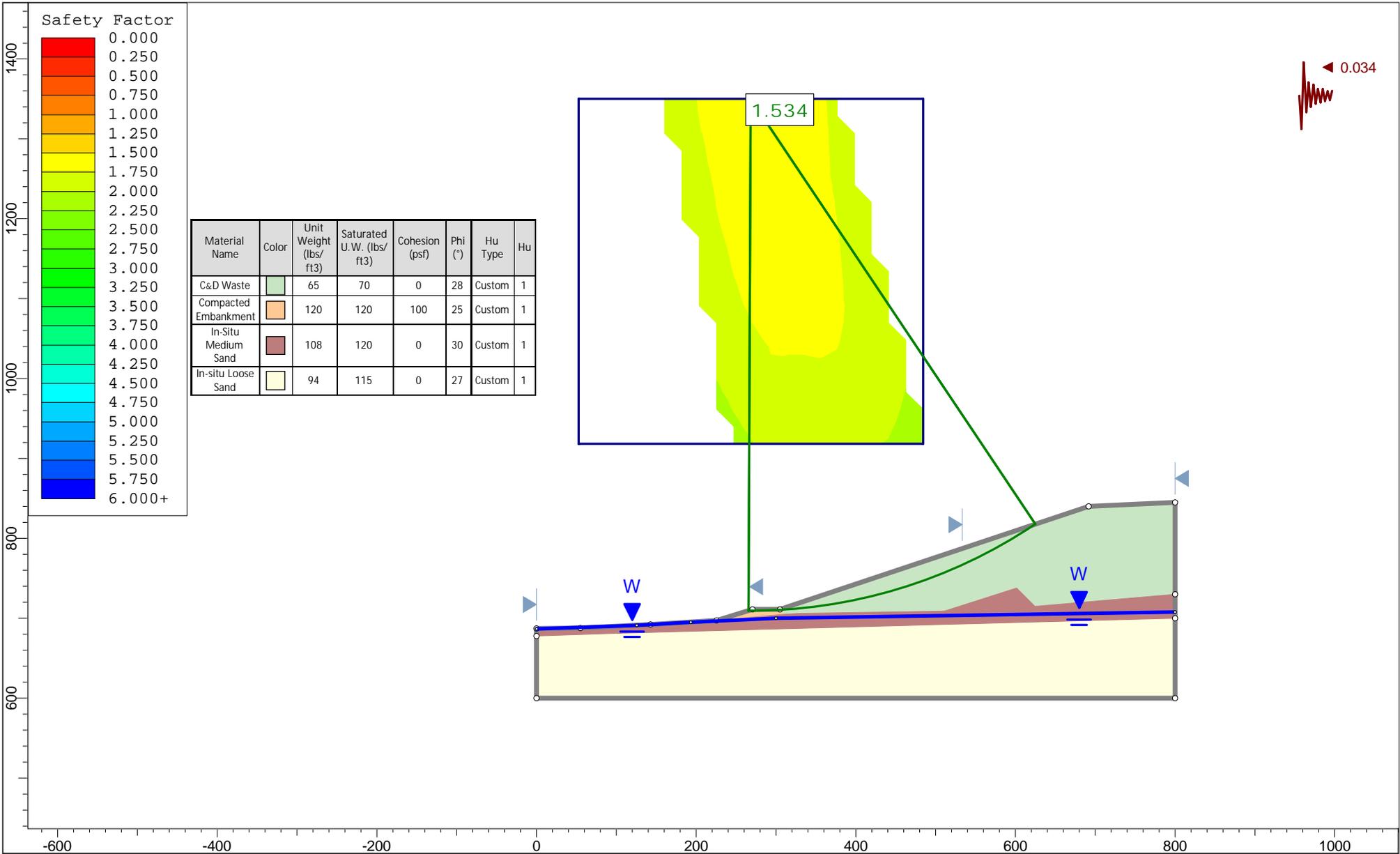
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|----------------------|------------|------------------------------|-----------------|
| Project | | Chambers County C&D Landfill | |
| Analysis Description | | Section AA CC Circular | |
| By | Greg Mills | Scale | 1:2000 |
| | | Analysis Method | Spencer Method |
| Date | 4/19/2024 | File Name | Section CC.slmd |



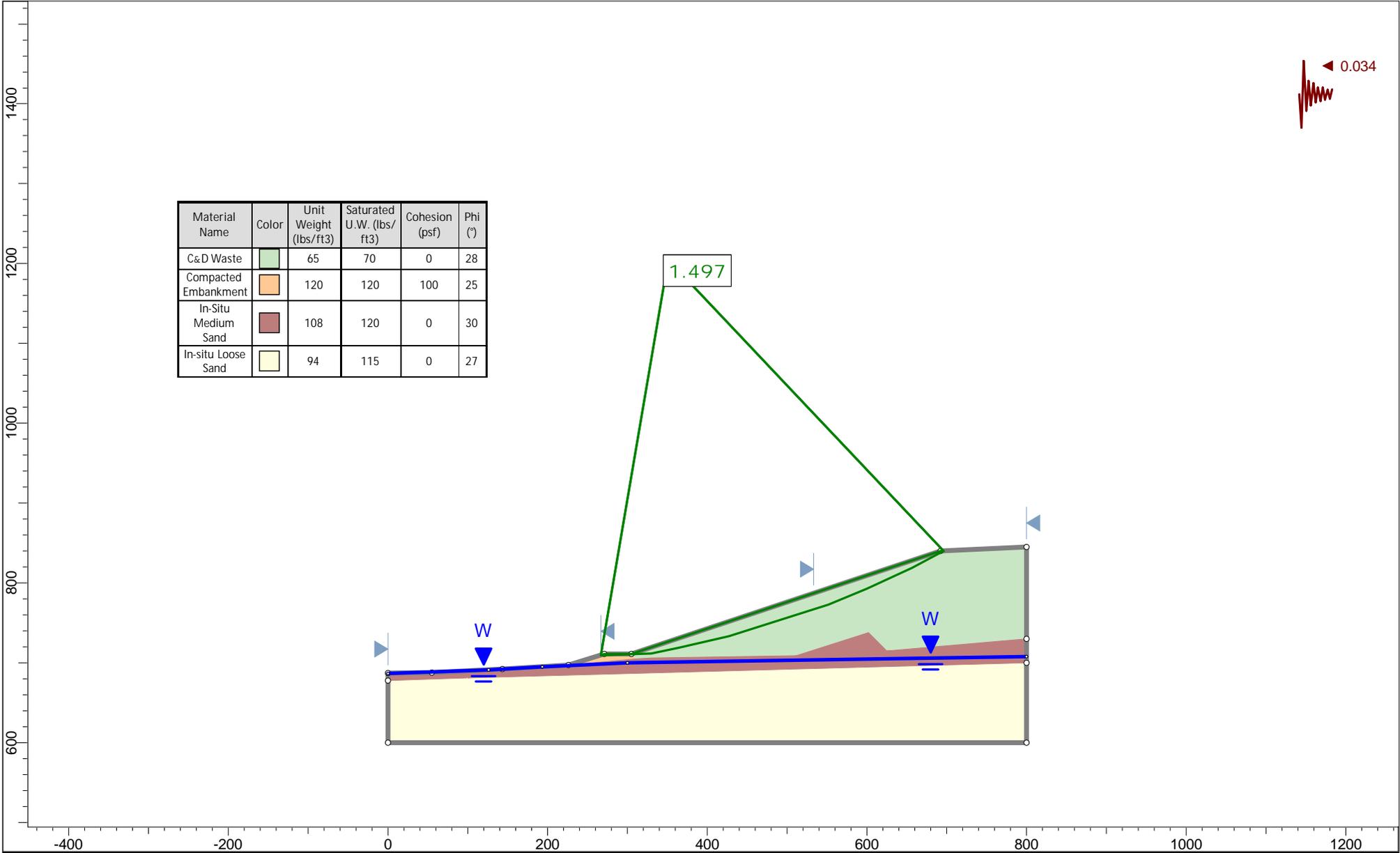
| Material Name | Color | Unit Weight (lbs/ft3) | Saturated U.W. (lbs/ft3) | Cohesion (psf) | Phi (°) |
|----------------------|--------|-----------------------|--------------------------|----------------|---------|
| C&D Waste | Green | 65 | 70 | 0 | 28 |
| Compacted Embankment | Orange | 120 | 120 | 100 | 25 |
| In-Situ Medium Sand | Red | 108 | 120 | 0 | 30 |
| In-situ Loose Sand | Yellow | 94 | 115 | 0 | 27 |



| | | | |
|-----------------------------|----------------|----------------------------------|-----------------|
| <i>Project</i> | | Chambers County C&D Landfill | |
| <i>Analysis Description</i> | | Section AA CC Block Non-Circular | |
| <i>By</i> | Greg Mills | <i>Scale</i> | 1:2000 |
| <i>Analysis Method</i> | Spencer Method | | |
| <i>Date</i> | 4/19/2024 | <i>File Name</i> | Section CC.slmd |



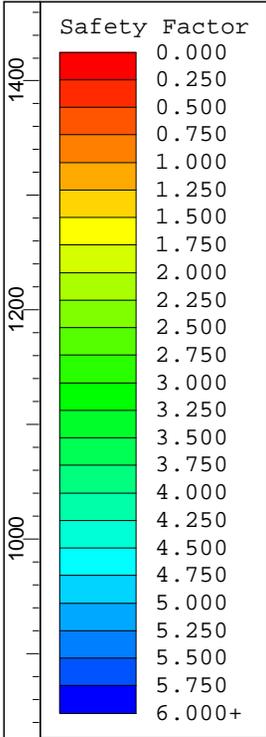
| | | | | | | | |
|-----------------------------|--|------------|--|--------------------------------|--|-----------------|--|
| <i>Project</i> | | | | Chambers County C&D Landfill | | | |
| <i>Analysis Description</i> | | | | Section AA CC Circular Seismic | | | |
| <i>By</i> | | Greg Mills | | <i>Scale</i> | | 1:2000 | |
| <i>Date</i> | | 4/19/2024 | | <i>Analysis Method</i> | | Spencer Method | |
| | | | | <i>File Name</i> | | Section CC.slmd | |



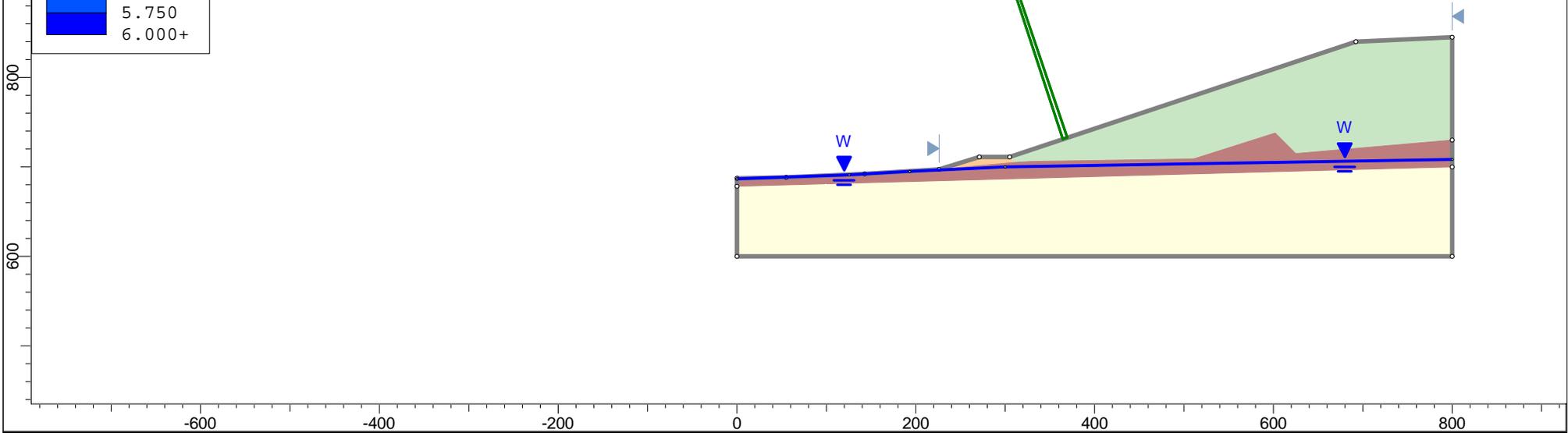
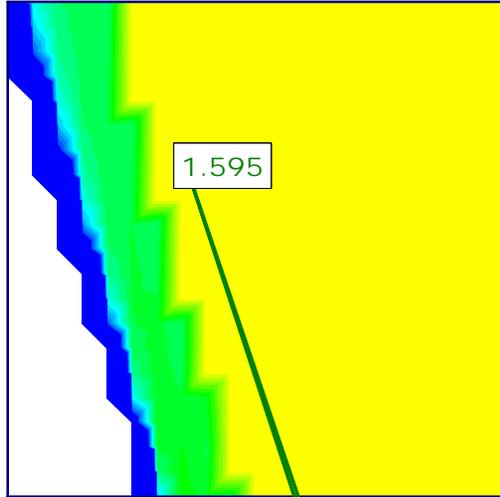
| Material Name | Color | Unit Weight (lbs/ft3) | Saturated U.W. (lbs/ft3) | Cohesion (psf) | Phi (°) |
|----------------------|---------------|-----------------------|--------------------------|----------------|---------|
| C&D Waste | Light Green | 65 | 70 | 0 | 28 |
| Compacted Embankment | Orange | 120 | 120 | 100 | 25 |
| In-Situ Medium Sand | Reddish Brown | 108 | 120 | 0 | 30 |
| In-situ Loose Sand | Yellow | 94 | 115 | 0 | 27 |



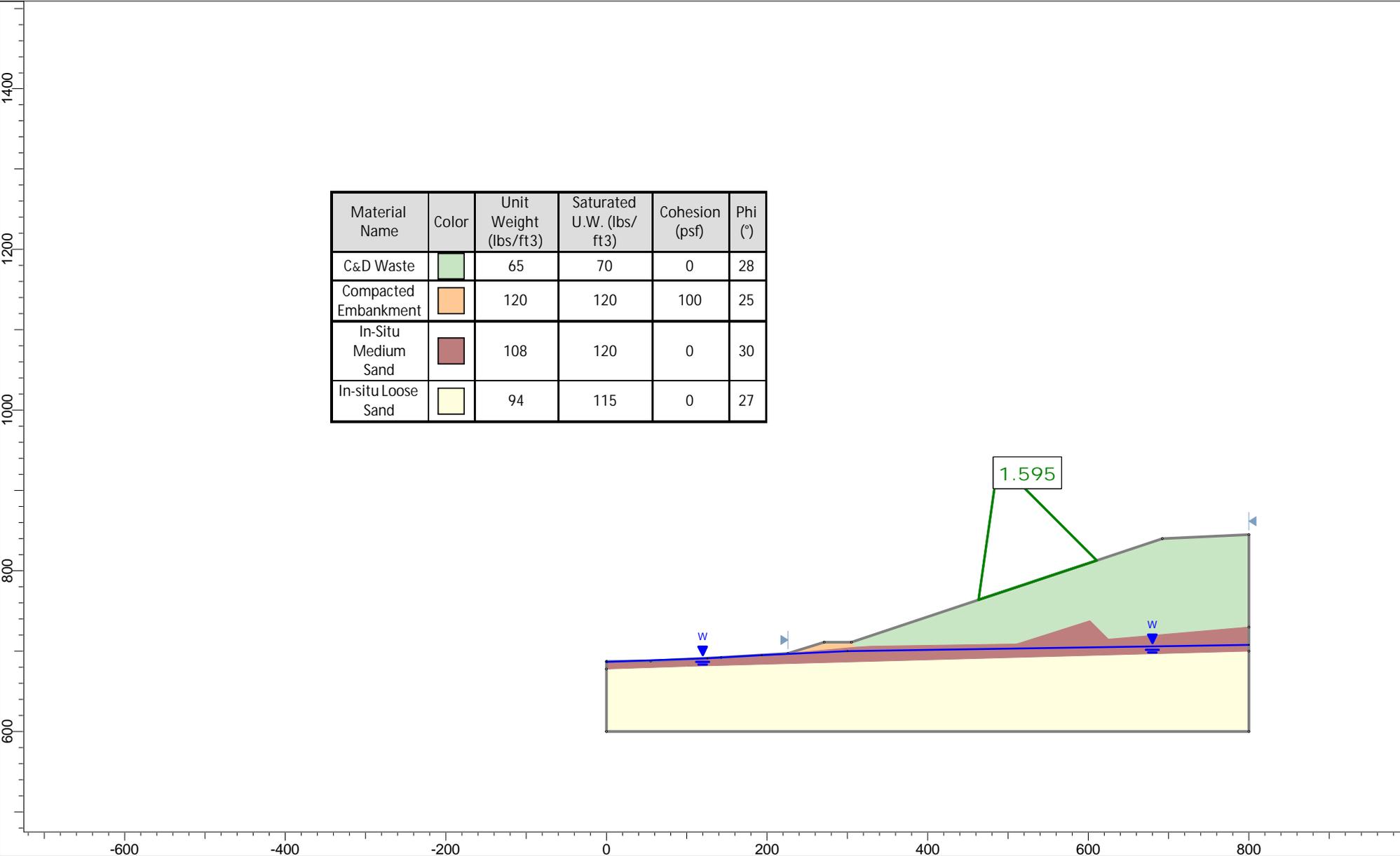
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|----------------------|------------|--|-----------------|
| Project | | Chambers County C&D Landfill | |
| Analysis Description | | Section AA CC Block Non-Circular Seismic | |
| By | Greg Mills | Scale | 1:2000 |
| | | Analysis Method | Spencer Method |
| Date | 4/19/2024 | File Name | Section CC.sImd |



| Material Name | Color | Unit Weight (lbs/ft ³) | Saturated U.W. (lbs/ft ³) | Cohesion (psf) | Phi (°) |
|----------------------|-------|------------------------------------|---------------------------------------|----------------|---------|
| C&D Waste | | 65 | 70 | 0 | 28 |
| Compacted Embankment | | 120 | 120 | 100 | 25 |
| In-Situ Medium Sand | | 108 | 120 | 0 | 30 |
| In-situ Loose Sand | | 94 | 115 | 0 | 27 |



| | | | | | | | |
|-----------------------------|--|------------|--|------------------------------|--|-----------------|--|
| <i>Project</i> | | | | Chambers County C&D Landfill | | | |
| <i>Analysis Description</i> | | | | Section AA CC Circular | | | |
| <i>By</i> | | Greg Mills | | <i>Scale</i> | | 1:2000 | |
| <i>Date</i> | | 4/19/2024 | | <i>Analysis Method</i> | | Spencer Method | |
| | | | | <i>File Name</i> | | Section CC.slmd | |

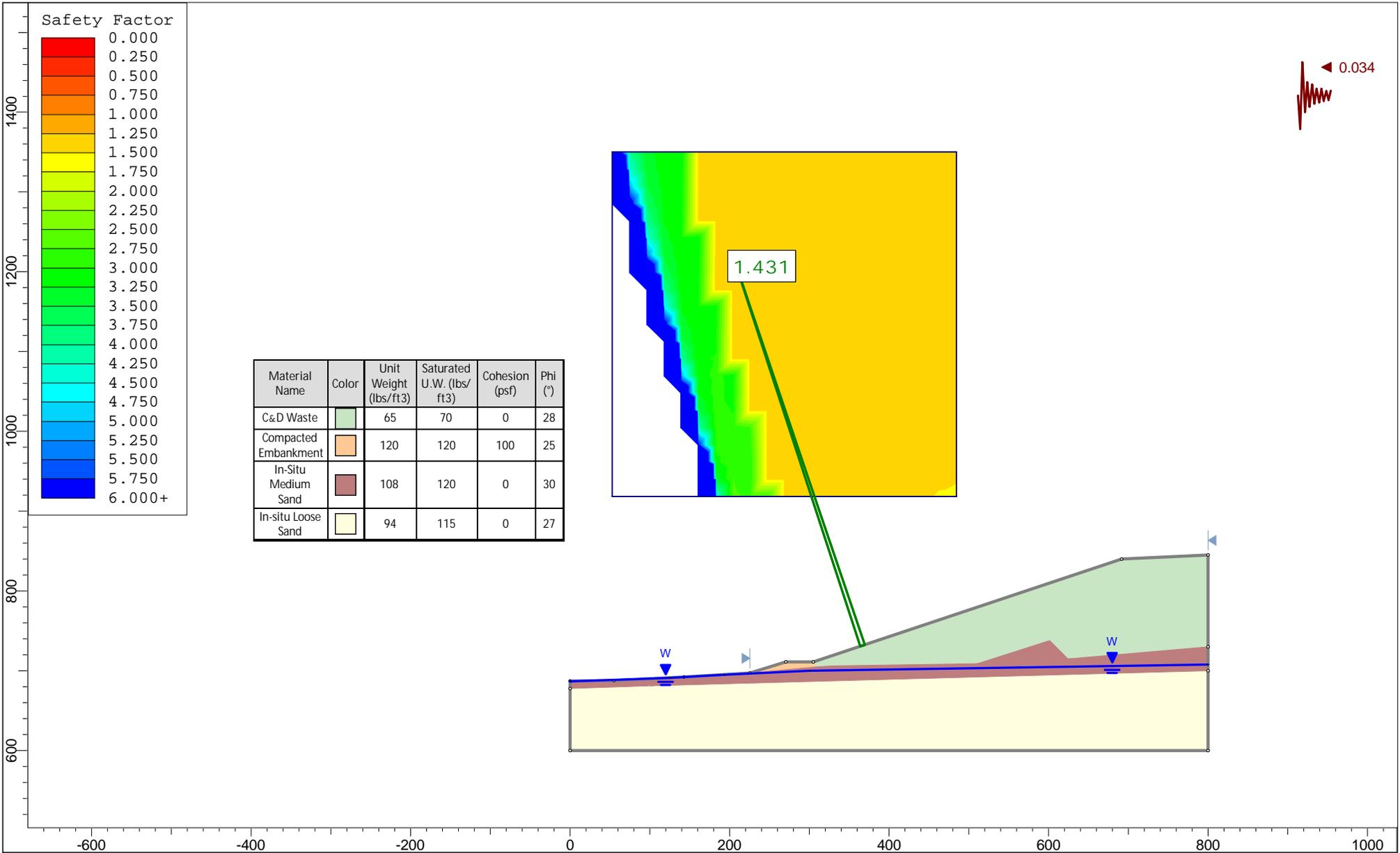


| Material Name | Color | Unit Weight (lbs/ft3) | Saturated U.W. (lbs/ft3) | Cohesion (psf) | Phi (°) |
|----------------------|--------|-----------------------|--------------------------|----------------|---------|
| C&D Waste | Green | 65 | 70 | 0 | 28 |
| Compacted Embankment | Orange | 120 | 120 | 100 | 25 |
| In-Situ Medium Sand | Red | 108 | 120 | 0 | 30 |
| In-situ Loose Sand | Yellow | 94 | 115 | 0 | 27 |

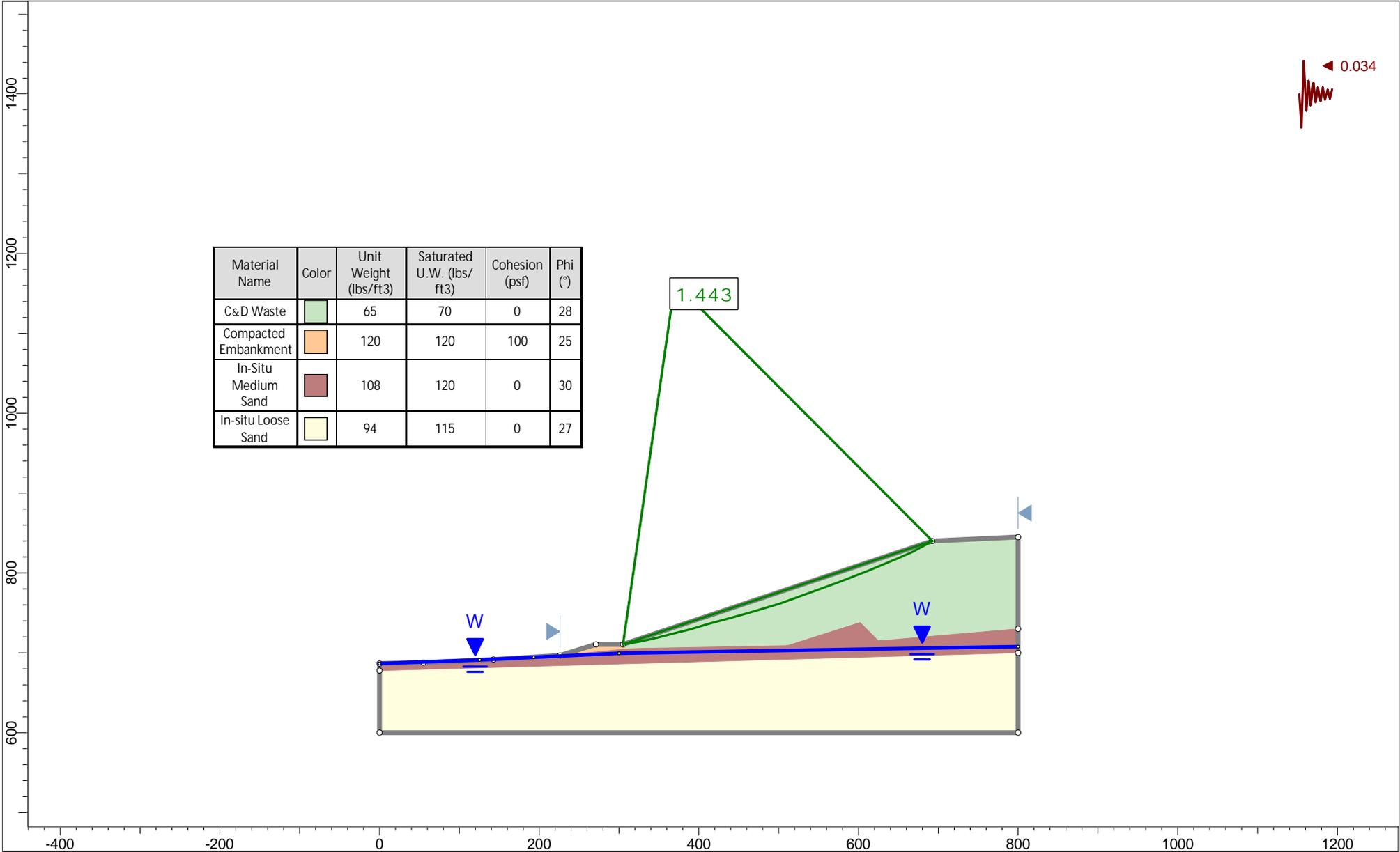
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| | | | |
|-----------------------------|----------------|----------------------------------|-----------------|
| <i>Project</i> | | Chambers County C&D Landfill | |
| <i>Analysis Description</i> | | Section AA CC Block Non-Circular | |
| <i>By</i> | Greg Mills | <i>Scale</i> | 1:2000 |
| <i>Analysis Method</i> | Spencer Method | | |
| <i>Date</i> | 4/19/2024 | <i>File Name</i> | Section CC.slmd |



| | | | |
|----------------------|------------|------------------------------|-----------------|
| Project | | Chambers County C&D Landfill | |
| Analysis Description | | Section AA CC Circular | |
| By | Greg Mills | Scale | 1:2000 |
| | | Analysis Method | Spencer Method |
| Date | 4/19/2024 | File Name | Section CC.slmd |



| Material Name | Color | Unit Weight (lbs/ft ³) | Saturated U.W. (lbs/ft ³) | Cohesion (psf) | Phi (°) |
|----------------------|---------------------------------------|------------------------------------|---------------------------------------|----------------|---------|
| C&D Waste | ■ | 65 | 70 | 0 | 28 |
| Compacted Embankment | ■ | 120 | 120 | 100 | 25 |
| In-Situ Medium Sand | ■ | 108 | 120 | 0 | 30 |
| In-situ Loose Sand | ■ | 94 | 115 | 0 | 27 |



| | | | |
|-----------------------------|----------------|----------------------------------|-----------------|
| <i>Project</i> | | Chambers County C&D Landfill | |
| <i>Analysis Description</i> | | Section AA CC Block Non-Circular | |
| <i>By</i> | Greg Mills | <i>Scale</i> | 1:2000 |
| <i>Analysis Method</i> | Spencer Method | | |
| <i>Date</i> | 4/19/2024 | <i>File Name</i> | Section CC.slmd |



Section CC
Chambers County Landfill
Date Created: 2/1/22
Software Version: 9.033

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 Global Minimum Query (spencer) - Safety Factor: 1.59514 20
In Waste - CC Block Non-Circular 21
 Global Minimum Query (spencer) - Safety Factor: 1.59513 21

Seismic Loading

◆ Group 1

| | |
|-------------------------------|----|
| Advanced seismic analysis: | No |
| Staged pseudostatic analysis: | No |

◆ Group 2

| | |
|--|-------|
| Advanced seismic analysis: | No |
| Staged pseudostatic analysis: | No |
| Seismic Load Coefficient (Horizontal): | 0.034 |

◆ In Waste

| | |
|-------------------------------|----|
| Advanced seismic analysis: | No |
| Staged pseudostatic analysis: | No |

Materials

C&D Waste

| | |
|---|---|
| Color |  |
| Strength Type | Mohr-Coulomb |
| Unit Weight | 65 lbs/ft ³ |
| Saturated U.W. | 70 lbs/ft ³ |
| Cohesion | 0 psf |
| Phi | 28 ° |
| Water Surface | Assigned per scenario |
| Hu Type | Custom |
| Hu | 1 |
| Specify alternate strength type above water surface | No |

Compacted Embankment

| | |
|---|---|
| Color |  |
| Strength Type | Mohr-Coulomb |
| Unit Weight | 120 lbs/ft ³ |
| Saturated U.W. | 120 lbs/ft ³ |
| Cohesion | 100 psf |
| Phi | 25 ° |
| Water Surface | Assigned per scenario |
| Hu Type | Custom |
| Hu | 1 |
| Specify alternate strength type above water surface | No |

In-Situ Medium Sand

| | |
|---|---|
| Color |  |
| Strength Type | Mohr-Coulomb |
| Unit Weight | 108 lbs/ft ³ |
| Saturated U.W. | 120 lbs/ft ³ |
| Cohesion | 0 psf |
| Phi | 30 ° |
| Water Surface | Assigned per scenario |
| Hu Type | Custom |
| Hu | 1 |
| Specify alternate strength type above water surface | No |

| In-situ Loose Sand | |
|---|---|
| Color |  |
| Strength Type | Mohr-Coulomb |
| Unit Weight | 94 lbs/ft3 |
| Saturated U.W. | 115 lbs/ft3 |
| Cohesion | 0 psf |
| Phi | 27 ° |
| Water Surface | Assigned per scenario |
| Hu Type | Custom |
| Hu | 1 |
| Specify alternate strength type above water surface | No |

Materials In Use

| Material | CC Circular | CC Block Non-Circular | CC Circular Seismic | CC Block Non-Circular Seismic | CC Circular | CC Block Non-Circular |
|----------------------|-------------|-----------------------|---------------------|-------------------------------|-------------|-----------------------|
| C&D Waste | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Compacted Embankment | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| In-Situ Medium Sand | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| In-situ Loose Sand | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Global Minimums

◆ Group 1 - CC Circular

Method: spencer

| | FS | 1.713190 |
|------------------------------|----|-------------------------|
| Center: | | 268.780, 1349.859 |
| Radius: | | 640.525 |
| Left Slip Surface Endpoint: | | 265.670, 709.342 |
| Right Slip Surface Endpoint: | | 625.420, 817.807 |
| Resisting Moment: | | 1.15416e+08 lb-ft |
| Driving Moment: | | 6.73689e+07 lb-ft |
| Resisting Horizontal Force: | | 170634 lb |
| Driving Horizontal Force: | | 99600.3 lb |
| Total Slice Area: | | 5270.45 ft ² |
| Surface Horizontal Width: | | 359.75 ft |
| Surface Average Height: | | 14.6503 ft |

◆ Group 1 - CC Block Non-Circular

Method: spencer

| | FS | 1.669230 |
|------------------------------|----|-------------------------|
| Axis Location: | | 350.970, 1204.637 |
| Left Slip Surface Endpoint: | | 266.666, 709.652 |
| Right Slip Surface Endpoint: | | 696.376, 840.203 |
| Resisting Moment: | | 8.66542e+07 lb-ft |
| Driving Moment: | | 5.19126e+07 lb-ft |
| Resisting Horizontal Force: | | 173183 lb |
| Driving Horizontal Force: | | 103750 lb |
| Total Slice Area: | | 5397.03 ft ² |
| Surface Horizontal Width: | | 429.71 ft |
| Surface Average Height: | | 12.5597 ft |

◆ Group 2 - CC Circular Seismic

Method: spencer

| | FS | 1.534320 |
|------------------------------|----|-------------------------|
| Center: | | 268.780, 1349.859 |
| Radius: | | 640.525 |
| Left Slip Surface Endpoint: | | 265.670, 709.342 |
| Right Slip Surface Endpoint: | | 625.420, 817.807 |
| Resisting Moment: | | 1.14086e+08 lb-ft |
| Driving Moment: | | 7.43564e+07 lb-ft |
| Resisting Horizontal Force: | | 168929 lb |
| Driving Horizontal Force: | | 110100 lb |
| Total Slice Area: | | 5270.45 ft ² |
| Surface Horizontal Width: | | 359.75 ft |
| Surface Average Height: | | 14.6503 ft |

◆ Group 2 - CC Block Non-Circular Seismic

Method: spencer

| | FS | 1.497360 |
|------------------------------|----|-------------------------|
| Axis Location: | | 350.744, 1204.128 |
| Left Slip Surface Endpoint: | | 266.666, 709.652 |
| Right Slip Surface Endpoint: | | 695.879, 840.180 |
| Resisting Moment: | | 8.96339e+07 lb-ft |
| Driving Moment: | | 5.98614e+07 lb-ft |
| Resisting Horizontal Force: | | 179094 lb |
| Driving Horizontal Force: | | 119607 lb |
| Total Slice Area: | | 5644.94 ft ² |
| Surface Horizontal Width: | | 429.213 ft |
| Surface Average Height: | | 13.1518 ft |

◆ In Waste - CC Circular

Method: spencer

| | FS | 1.595140 |
|------------------------------|----|---------------------------|
| Center: | | 204.044, 1220.389 |
| Radius: | | 515.181 |
| Left Slip Surface Endpoint: | | 364.268, 730.756 |
| Right Slip Surface Endpoint: | | 369.645, 732.548 |
| Resisting Moment: | | 496.708 lb-ft |
| Driving Moment: | | 311.389 lb-ft |
| Resisting Horizontal Force: | | 0.91467 lb |
| Driving Horizontal Force: | | 0.573411 lb |
| Total Slice Area: | | 0.0294058 ft ² |
| Surface Horizontal Width: | | 5.37704 ft |
| Surface Average Height: | | 0.00546878 ft |

◆ In Waste - CC Block Non-Circular

Method: spencer

| | FS | 1.595130 |
|------------------------------|----|--------------------------|
| Axis Location: | | 487.995, 935.560 |
| Left Slip Surface Endpoint: | | 463.461, 763.820 |
| Right Slip Surface Endpoint: | | 610.666, 812.889 |
| Resisting Moment: | | 568.663 lb-ft |
| Driving Moment: | | 356.5 lb-ft |
| Resisting Horizontal Force: | | 3.47665 lb |
| Driving Horizontal Force: | | 2.17954 lb |
| Total Slice Area: | | 0.111771 ft ² |
| Surface Horizontal Width: | | 147.205 ft |
| Surface Average Height: | | 0.00075929 ft |

Global Minimum Coordinates

◆ Group 1 - CC Block Non-Circular

Method: spencer

| X | Y |
|---------|---------|
| 266.666 | 709.652 |
| 295.579 | 710.668 |
| 324.492 | 711.685 |
| 366.05 | 719.73 |
| 401.543 | 728.952 |
| 435.842 | 738.829 |
| 470.14 | 748.706 |
| 488.433 | 753.973 |
| 527.737 | 766.693 |
| 567.041 | 780.324 |
| 588.965 | 788.091 |
| 610.838 | 796.14 |
| 634.862 | 806.866 |
| 654.64 | 816.215 |
| 675.508 | 828.209 |
| 696.376 | 840.203 |

◆ Group 2 - CC Block Non-Circular Seismic

Method: spencer

| X | Y |
|---------|---------|
| 266.666 | 709.652 |
| 329.746 | 711.862 |
| 364.248 | 718.771 |
| 426.812 | 733.02 |
| 551.419 | 772.96 |
| 599.761 | 792.631 |
| 656.364 | 818.854 |
| 695.879 | 840.18 |

◆ In Waste - CC Block Non-Circular

Method: spencer

| X | Y |
|---------|---------|
| 463.461 | 763.82 |
| 486.388 | 771.462 |
| 488.311 | 772.103 |
| 523.814 | 783.937 |
| 540.156 | 789.384 |
| 575.122 | 801.04 |
| 598.671 | 808.89 |
| 610.666 | 812.889 |

Slice Data

◆ Group 1 - CC Circular

Global Minimum Query (spencer) - Safety Factor: 1.71319

| Slice Number | Width [ft] | Weight [lbs] | Angle of Slice Base [deg] | Base Material | Base Cohesion [psf] | Base Friction Angle [deg] | Shear Stress [psf] | Shear Strength [psf] | Base Normal Stress [psf] | Pore Pressure [psf] | Effective Normal Stress [psf] | Base Vertical Stress [psf] | Effective Vertical Stress [psf] |
|--------------|------------|--------------|---------------------------|----------------------|---------------------|---------------------------|--------------------|----------------------|--------------------------|---------------------|-------------------------------|----------------------------|---------------------------------|
| 1 | 13.3122 | 2059.83 | 0.317247 | Compacted Embankment | 100 | 25 | 109.135 | 186.969 | 186.505 | 0 | 186.505 | 187.109 | 187.109 |
| 2 | 13.3122 | 2251.33 | 1.50827 | Compacted Embankment | 100 | 25 | 112.337 | 192.454 | 198.269 | 0 | 198.269 | 201.227 | 201.227 |
| 3 | 13.3122 | 1463.81 | 2.69995 | Compacted Embankment | 100 | 25 | 94.2803 | 161.52 | 131.93 | 0 | 131.93 | 136.376 | 136.376 |
| 4 | 14.537 | 2579.21 | 3.94776 | C&D Waste | 0 | 28 | 58.0227 | 99.4039 | 186.951 | 0 | 186.951 | 190.955 | 190.955 |
| 5 | 14.537 | 6052.55 | 5.25243 | C&D Waste | 0 | 28 | 134.19 | 229.893 | 432.366 | 0 | 432.366 | 444.702 | 444.702 |
| 6 | 14.537 | 9210.08 | 6.55983 | C&D Waste | 0 | 28 | 201.261 | 344.799 | 648.472 | 0 | 648.472 | 671.616 | 671.616 |
| 7 | 14.537 | 12049.5 | 7.87068 | C&D Waste | 0 | 28 | 259.547 | 444.654 | 836.274 | 0 | 836.274 | 872.153 | 872.153 |
| 8 | 14.537 | 14568.2 | 9.18569 | C&D Waste | 0 | 28 | 309.332 | 529.944 | 996.678 | 0 | 996.678 | 1046.7 | 1046.7 |
| 9 | 14.537 | 16762.6 | 10.5056 | C&D Waste | 0 | 28 | 350.872 | 601.11 | 1130.52 | 0 | 1130.52 | 1195.59 | 1195.59 |
| 10 | 14.537 | 18629 | 11.8312 | C&D Waste | 0 | 28 | 384.404 | 658.557 | 1238.57 | 0 | 1238.57 | 1319.09 | 1319.09 |
| 11 | 14.537 | 20162.7 | 13.1632 | C&D Waste | 0 | 28 | 410.142 | 702.652 | 1321.49 | 0 | 1321.49 | 1417.41 | 1417.41 |
| 12 | 14.537 | 21358.7 | 14.5025 | C&D Waste | 0 | 28 | 428.283 | 733.73 | 1379.95 | 0 | 1379.95 | 1490.73 | 1490.73 |
| 13 | 14.537 | 22210.9 | 15.85 | C&D Waste | 0 | 28 | 439.003 | 752.096 | 1414.48 | 0 | 1414.48 | 1539.12 | 1539.12 |
| 14 | 14.537 | 22712.8 | 17.2066 | C&D Waste | 0 | 28 | 442.466 | 758.029 | 1425.65 | 0 | 1425.65 | 1562.67 | 1562.67 |
| 15 | 14.537 | 22856.8 | 18.5731 | C&D Waste | 0 | 28 | 438.821 | 751.783 | 1413.9 | 0 | 1413.9 | 1561.35 | 1561.35 |
| 16 | 14.537 | 22634.7 | 19.9507 | C&D Waste | 0 | 28 | 428.2 | 733.588 | 1379.67 | 0 | 1379.67 | 1535.11 | 1535.11 |
| 17 | 14.537 | 22037 | 21.3405 | C&D Waste | 0 | 28 | 410.727 | 703.653 | 1323.38 | 0 | 1323.38 | 1483.85 | 1483.85 |
| 18 | 14.537 | 21053.2 | 22.7436 | C&D Waste | 0 | 28 | 386.512 | 662.169 | 1245.36 | 0 | 1245.36 | 1407.39 | 1407.39 |
| 19 | 14.537 | 19671.8 | 24.1612 | C&D Waste | 0 | 28 | 355.658 | 609.309 | 1145.94 | 0 | 1145.94 | 1305.49 | 1305.49 |
| 20 | 14.537 | 17879.6 | 25.5948 | C&D Waste | 0 | 28 | 318.254 | 545.229 | 1025.43 | 0 | 1025.43 | 1177.87 | 1177.87 |
| 21 | 14.537 | 15662.1 | 27.0457 | C&D Waste | 0 | 28 | 274.385 | 470.074 | 884.084 | 0 | 884.084 | 1024.17 | 1024.17 |
| 22 | 14.537 | 13003 | 28.5157 | C&D Waste | 0 | 28 | 224.128 | 383.974 | 722.154 | 0 | 722.154 | 843.925 | 843.925 |
| 23 | 14.537 | 9883.93 | 30.0065 | C&D Waste | 0 | 28 | 167.553 | 287.05 | 539.863 | 0 | 539.863 | 636.625 | 636.625 |
| 24 | 14.537 | 6284.28 | 31.5201 | C&D Waste | 0 | 28 | 104.725 | 179.414 | 337.429 | 0 | 337.429 | 401.655 | 401.655 |
| 25 | 14.537 | 2180.79 | 33.0586 | C&D Waste | 0 | 28 | 35.8691 | 61.4506 | 115.572 | 0 | 115.572 | 138.918 | 138.918 |

◆ Group 1 - CC Block Non-Circular

Global Minimum Query (spencer) - Safety Factor: 1.66923

| Slice Number | Width [ft] | Weight [lbs] | Angle of Slice Base [deg] | Base Material | Base Cohesion [psf] | Base Friction Angle [deg] | Shear Stress [psf] | Shear Strength [psf] | Base Normal Stress [psf] | Pore Pressure [psf] | Effective Normal Stress [psf] | Base Vertical Stress [psf] | Effective Vertical Stress [psf] |
|--------------|------------|--------------|---------------------------|----------------------|---------------------|---------------------------|--------------------|----------------------|--------------------------|---------------------|-------------------------------|----------------------------|---------------------------------|
| 1 | 14.4566 | 1547.62 | 2.01358 | Compacted Embankment | 100 | 25 | 96.8045 | 161.589 | 132.078 | 0 | 132.078 | 135.481 | 135.481 |
| 2 | 14.4566 | 1016.51 | 2.01358 | Compacted Embankment | 100 | 25 | 85.822 | 143.257 | 92.7646 | 0 | 92.7646 | 95.7819 | 95.7819 |
| 3 | 9.42136 | 187.904 | 2.01358 | Compacted Embankment | 100 | 25 | 70.7645 | 118.122 | 38.8633 | 0 | 38.8633 | 41.3512 | 41.3512 |
| 4 | 19.4919 | 3682.81 | 2.01358 | C&D Waste | 0 | 28 | 65.1492 | 108.749 | 204.528 | 0 | 204.528 | 206.818 | 206.818 |
| 5 | 13.8526 | 6105.39 | 10.9568 | C&D Waste | 0 | 28 | 137.218 | 229.048 | 430.777 | 0 | 430.777 | 457.342 | 457.342 |
| 6 | 13.8526 | 7848.33 | 10.9568 | C&D Waste | 0 | 28 | 176.39 | 294.436 | 553.753 | 0 | 553.753 | 587.902 | 587.902 |
| 7 | 13.8526 | 9591.26 | 10.9568 | C&D Waste | 0 | 28 | 215.562 | 359.823 | 676.728 | 0 | 676.728 | 718.461 | 718.461 |
| 8 | 17.7466 | 14156.2 | 14.565 | C&D Waste | 0 | 28 | 238.66 | 398.379 | 749.244 | 0 | 749.244 | 811.255 | 811.255 |
| 9 | 17.7466 | 15660.9 | 14.565 | C&D Waste | 0 | 28 | 264.029 | 440.725 | 828.88 | 0 | 828.88 | 897.483 | 897.483 |
| 10 | 17.1493 | 16294.5 | 16.0645 | C&D Waste | 0 | 28 | 279.645 | 466.791 | 877.906 | 0 | 877.906 | 958.434 | 958.434 |
| 11 | 17.1493 | 17161.8 | 16.0645 | C&D Waste | 0 | 28 | 294.529 | 491.637 | 924.633 | 0 | 924.633 | 1009.45 | 1009.45 |
| 12 | 17.1491 | 18028.8 | 16.0645 | C&D Waste | 0 | 28 | 309.413 | 516.482 | 971.362 | 0 | 971.362 | 1060.46 | 1060.46 |
| 13 | 17.1491 | 18896.1 | 16.0645 | C&D Waste | 0 | 28 | 324.297 | 541.326 | 1018.08 | 0 | 1018.08 | 1111.47 | 1111.47 |
| 14 | 18.2924 | 21111.8 | 16.0645 | C&D Waste | 0 | 28 | 339.677 | 566.999 | 1066.37 | 0 | 1066.37 | 1164.18 | 1164.18 |
| 15 | 13.1014 | 15528.3 | 17.9322 | C&D Waste | 0 | 28 | 341.776 | 570.502 | 1072.96 | 0 | 1072.96 | 1183.56 | 1183.56 |
| 16 | 13.1014 | 15636.8 | 17.9322 | C&D Waste | 0 | 28 | 344.162 | 574.486 | 1080.45 | 0 | 1080.45 | 1191.83 | 1191.83 |
| 17 | 13.1014 | 15745.2 | 17.9322 | C&D Waste | 0 | 28 | 346.55 | 578.471 | 1087.95 | 0 | 1087.95 | 1200.09 | 1200.09 |
| 18 | 19.6521 | 23529.9 | 19.1275 | C&D Waste | 0 | 28 | 340.771 | 568.825 | 1069.8 | 0 | 1069.8 | 1187.99 | 1187.99 |
| 19 | 19.6521 | 23191.4 | 19.1275 | C&D Waste | 0 | 28 | 335.868 | 560.641 | 1054.41 | 0 | 1054.41 | 1170.9 | 1170.9 |
| 20 | 21.924 | 25356.5 | 19.5079 | C&D Waste | 0 | 28 | 327.801 | 547.175 | 1029.09 | 0 | 1029.09 | 1145.22 | 1145.22 |
| 21 | 21.8733 | 24433 | 20.2018 | C&D Waste | 0 | 28 | 314.195 | 524.463 | 986.372 | 0 | 986.372 | 1101.98 | 1101.98 |
| 22 | 24.0238 | 24121.7 | 24.059 | C&D Waste | 0 | 28 | 270.661 | 451.796 | 849.703 | 0 | 849.703 | 970.544 | 970.544 |
| 23 | 19.7782 | 16339.9 | 25.3004 | C&D Waste | 0 | 28 | 219.643 | 366.634 | 689.539 | 0 | 689.539 | 793.366 | 793.366 |
| 24 | 20.8676 | 11953.8 | 29.8884 | C&D Waste | 0 | 28 | 144.574 | 241.327 | 453.869 | 0 | 453.869 | 536.963 | 536.963 |
| 25 | 20.8676 | 4941.72 | 29.8884 | C&D Waste | 0 | 28 | 59.7673 | 99.7654 | 187.632 | 0 | 187.632 | 221.983 | 221.983 |

◆ Group 2 - CC Circular Seismic

Global Minimum Query (spencer) - Safety Factor: 1.53432

| Slice Number | Width [ft] | Weight [lbs] | Angle of Slice Base [deg] | Base Material | Base Cohesion [psf] | Base Friction Angle [deg] | Shear Stress [psf] | Shear Strength [psf] | Base Normal Stress [psf] | Pore Pressure [psf] | Effective Normal Stress [psf] | Base Vertical Stress [psf] | Effective Vertical Stress [psf] |
|--------------|------------|--------------|---------------------------|----------------------|---------------------|---------------------------|--------------------|----------------------|--------------------------|---------------------|-------------------------------|----------------------------|---------------------------------|
| 1 | 13.3122 | 2059.83 | 0.317247 | Compacted Embankment | 100 | 25 | 122.568 | 188.058 | 188.841 | 0 | 188.841 | 189.52 | 189.52 |
| 2 | 13.3122 | 2251.33 | 1.50827 | Compacted Embankment | 100 | 25 | 126.034 | 193.376 | 200.245 | 0 | 200.245 | 203.564 | 203.564 |
| 3 | 13.3122 | 1463.81 | 2.69995 | Compacted Embankment | 100 | 25 | 105.802 | 162.334 | 133.675 | 0 | 133.675 | 138.664 | 138.664 |
| 4 | 14.537 | 2579.21 | 3.94776 | C&D Waste | 0 | 28 | 64.6917 | 99.2577 | 186.677 | 0 | 186.677 | 191.141 | 191.141 |
| 5 | 14.537 | 6052.55 | 5.25243 | C&D Waste | 0 | 28 | 149.468 | 229.331 | 431.309 | 0 | 431.309 | 445.049 | 445.049 |
| 6 | 14.537 | 9210.08 | 6.55983 | C&D Waste | 0 | 28 | 223.96 | 343.627 | 646.268 | 0 | 646.268 | 672.022 | 672.022 |
| 7 | 14.537 | 12049.5 | 7.87068 | C&D Waste | 0 | 28 | 288.549 | 442.727 | 832.648 | 0 | 832.648 | 872.537 | 872.537 |
| 8 | 14.537 | 14568.2 | 9.18569 | C&D Waste | 0 | 28 | 343.58 | 527.161 | 991.442 | 0 | 991.442 | 1047 | 1047 |
| 9 | 14.537 | 16762.6 | 10.5056 | C&D Waste | 0 | 28 | 389.366 | 597.412 | 1123.57 | 0 | 1123.57 | 1195.77 | 1195.77 |
| 10 | 14.537 | 18629 | 11.8312 | C&D Waste | 0 | 28 | 426.195 | 653.92 | 1229.85 | 0 | 1229.85 | 1319.13 | 1319.13 |
| 11 | 14.537 | 20162.7 | 13.1632 | C&D Waste | 0 | 28 | 454.331 | 697.089 | 1311.03 | 0 | 1311.03 | 1417.29 | 1417.29 |
| 12 | 14.537 | 21358.7 | 14.5025 | C&D Waste | 0 | 28 | 474.011 | 727.285 | 1367.83 | 0 | 1367.83 | 1490.44 | 1490.44 |
| 13 | 14.537 | 22210.9 | 15.85 | C&D Waste | 0 | 28 | 485.456 | 744.845 | 1400.85 | 0 | 1400.85 | 1538.68 | 1538.68 |
| 14 | 14.537 | 22712.8 | 17.2066 | C&D Waste | 0 | 28 | 488.866 | 750.077 | 1410.69 | 0 | 1410.69 | 1562.08 | 1562.08 |
| 15 | 14.537 | 22856.8 | 18.5731 | C&D Waste | 0 | 28 | 484.424 | 743.261 | 1397.87 | 0 | 1397.87 | 1560.64 | 1560.64 |
| 16 | 14.537 | 22634.7 | 19.9507 | C&D Waste | 0 | 28 | 472.297 | 724.655 | 1362.88 | 0 | 1362.88 | 1534.32 | 1534.32 |
| 17 | 14.537 | 22037 | 21.3405 | C&D Waste | 0 | 28 | 452.64 | 694.495 | 1306.16 | 0 | 1306.16 | 1483 | 1483 |
| 18 | 14.537 | 21053.2 | 22.7436 | C&D Waste | 0 | 28 | 425.593 | 652.996 | 1228.11 | 0 | 1228.11 | 1406.52 | 1406.52 |
| 19 | 14.537 | 19671.8 | 24.1612 | C&D Waste | 0 | 28 | 391.285 | 600.357 | 1129.1 | 0 | 1129.1 | 1304.64 | 1304.64 |
| 20 | 14.537 | 17879.6 | 25.5948 | C&D Waste | 0 | 28 | 349.836 | 536.76 | 1009.5 | 0 | 1009.5 | 1177.07 | 1177.07 |
| 21 | 14.537 | 15662.1 | 27.0457 | C&D Waste | 0 | 28 | 301.354 | 462.374 | 869.6 | 0 | 869.6 | 1023.45 | 1023.45 |
| 22 | 14.537 | 13003 | 28.5157 | C&D Waste | 0 | 28 | 245.944 | 377.357 | 709.702 | 0 | 709.702 | 843.326 | 843.326 |
| 23 | 14.537 | 9883.93 | 30.0065 | C&D Waste | 0 | 28 | 183.7 | 281.855 | 530.092 | 0 | 530.092 | 636.179 | 636.179 |
| 24 | 14.537 | 6284.28 | 31.5201 | C&D Waste | 0 | 28 | 114.715 | 176.01 | 331.027 | 0 | 331.027 | 401.38 | 401.38 |
| 25 | 14.537 | 2180.79 | 33.0586 | C&D Waste | 0 | 28 | 38.9998 | 59.8382 | 112.539 | 0 | 112.539 | 137.923 | 137.923 |

◆ Group 2 - CC Block Non-Circular Seismic

Global Minimum Query (spencer) - Safety Factor: 1.49736

| Slice Number | Width [ft] | Weight [lbs] | Angle of Slice Base [deg] | Base Material | Base Cohesion [psf] | Base Friction Angle [deg] | Shear Stress [psf] | Shear Strength [psf] | Base Normal Stress [psf] | Pore Pressure [psf] | Effective Normal Stress [psf] | Base Vertical Stress [psf] | Effective Vertical Stress [psf] |
|--------------|------------|--------------|---------------------------|----------------------|---------------------|---------------------------|--------------------|----------------------|--------------------------|---------------------|-------------------------------|----------------------------|---------------------------------|
| 1 | 19.1695 | 1978.56 | 2.00663 | Compacted Embankment | 100 | 25 | 107.043 | 160.282 | 129.275 | 0 | 129.275 | 133.025 | 133.025 |
| 2 | 19.1695 | 784.193 | 2.00663 | Compacted Embankment | 100 | 25 | 86.3413 | 129.284 | 62.7997 | 0 | 62.7997 | 65.8248 | 65.8248 |
| 3 | 24.7409 | 5945.13 | 2.00663 | C&D Waste | 0 | 28 | 92.1776 | 138.023 | 259.583 | 0 | 259.583 | 262.813 | 262.813 |
| 4 | 17.251 | 9570.2 | 11.3238 | C&D Waste | 0 | 28 | 190.352 | 285.026 | 536.055 | 0 | 536.055 | 574.173 | 574.173 |
| 5 | 17.251 | 12144.5 | 11.3238 | C&D Waste | 0 | 28 | 241.555 | 361.695 | 680.247 | 0 | 680.247 | 728.619 | 728.619 |
| 6 | 15.641 | 13017.6 | 12.8301 | C&D Waste | 0 | 28 | 280.625 | 420.196 | 790.275 | 0 | 790.275 | 854.186 | 854.186 |
| 7 | 15.641 | 14696.7 | 12.8301 | C&D Waste | 0 | 28 | 316.819 | 474.392 | 892.204 | 0 | 892.204 | 964.359 | 964.359 |
| 8 | 15.641 | 16375.7 | 12.8301 | C&D Waste | 0 | 28 | 353.014 | 528.589 | 994.134 | 0 | 994.134 | 1074.53 | 1074.53 |
| 9 | 15.641 | 18054.7 | 12.8301 | C&D Waste | 0 | 28 | 389.208 | 582.785 | 1096.06 | 0 | 1096.06 | 1184.7 | 1184.7 |
| 10 | 15.5759 | 18916.5 | 17.7723 | C&D Waste | 0 | 28 | 386.839 | 579.237 | 1089.39 | 0 | 1089.39 | 1213.38 | 1213.38 |
| 11 | 15.5759 | 19118.4 | 17.7723 | C&D Waste | 0 | 28 | 390.967 | 585.419 | 1101.01 | 0 | 1101.01 | 1226.33 | 1226.33 |
| 12 | 15.5759 | 19320.3 | 17.7723 | C&D Waste | 0 | 28 | 395.095 | 591.6 | 1112.64 | 0 | 1112.64 | 1239.28 | 1239.28 |
| 13 | 15.5759 | 19522.1 | 17.7723 | C&D Waste | 0 | 28 | 399.224 | 597.782 | 1124.26 | 0 | 1124.26 | 1252.23 | 1252.23 |
| 14 | 15.5759 | 19724 | 17.7723 | C&D Waste | 0 | 28 | 403.353 | 603.964 | 1135.89 | 0 | 1135.89 | 1265.18 | 1265.18 |
| 15 | 15.5759 | 19925.9 | 17.7723 | C&D Waste | 0 | 28 | 407.48 | 610.145 | 1147.52 | 0 | 1147.52 | 1278.13 | 1278.13 |
| 16 | 15.5759 | 20127.8 | 17.7723 | C&D Waste | 0 | 28 | 411.609 | 616.327 | 1159.14 | 0 | 1159.14 | 1291.08 | 1291.08 |
| 17 | 15.5759 | 20329.7 | 17.7723 | C&D Waste | 0 | 28 | 415.738 | 622.509 | 1170.77 | 0 | 1170.77 | 1304.03 | 1304.03 |
| 18 | 16.1139 | 20515.3 | 22.1423 | C&D Waste | 0 | 28 | 385.654 | 577.463 | 1086.05 | 0 | 1086.05 | 1242.98 | 1242.98 |
| 19 | 16.1139 | 19273.3 | 22.1423 | C&D Waste | 0 | 28 | 362.308 | 542.505 | 1020.31 | 0 | 1020.31 | 1167.74 | 1167.74 |
| 20 | 16.1139 | 18031.4 | 22.1423 | C&D Waste | 0 | 28 | 338.961 | 507.546 | 954.553 | 0 | 954.553 | 1092.48 | 1092.48 |
| 21 | 18.8675 | 18882.1 | 24.8576 | C&D Waste | 0 | 28 | 293.763 | 439.869 | 827.274 | 0 | 827.274 | 963.37 | 963.37 |
| 22 | 18.8675 | 15875.1 | 24.8576 | C&D Waste | 0 | 28 | 246.981 | 369.819 | 695.529 | 0 | 695.529 | 809.952 | 809.952 |
| 23 | 18.8675 | 12868.1 | 24.8576 | C&D Waste | 0 | 28 | 200.199 | 299.77 | 563.784 | 0 | 563.784 | 656.533 | 656.533 |
| 24 | 19.7575 | 9282.97 | 28.3545 | C&D Waste | 0 | 28 | 132.371 | 198.207 | 372.774 | 0 | 372.774 | 444.21 | 444.21 |
| 25 | 19.7575 | 3907.15 | 28.3545 | C&D Waste | 0 | 28 | 55.7281 | 83.445 | 156.937 | 0 | 156.937 | 187.012 | 187.012 |

In Waste - CC Circular

Global Minimum Query (spencer) - Safety Factor: 1.59514

| Slice Number | Width [ft] | Weight [lbs] | Angle of Slice Base [deg] | Base Material | Base Cohesion [psf] | Base Friction Angle [deg] | Shear Stress [psf] | Shear Strength [psf] | Base Normal Stress [psf] | Pore Pressure [psf] | Effective Normal Stress [psf] | Base Vertical Stress [psf] | Effective Vertical Stress [psf] |
|--------------|------------|--------------|---------------------------|---------------|---------------------|---------------------------|--------------------|----------------------|--------------------------|---------------------|-------------------------------|----------------------------|---------------------------------|
| 1 | 0.215082 | 0.00880694 | 18.1324 | C&D Waste | 0 | 28 | 0.0123056 | 0.0196292 | 0.0369171 | 0 | 0.0369171 | 0.0409469 | 0.0409469 |
| 2 | 0.215082 | 0.0256893 | 18.1575 | C&D Waste | 0 | 28 | 0.0358896 | 0.0572489 | 0.10767 | 0 | 0.10767 | 0.11944 | 0.11944 |
| 3 | 0.215082 | 0.0411085 | 18.1827 | C&D Waste | 0 | 28 | 0.0574227 | 0.0915973 | 0.17227 | 0 | 0.17227 | 0.19113 | 0.19113 |
| 4 | 0.215082 | 0.0550638 | 18.2079 | C&D Waste | 0 | 28 | 0.0769048 | 0.122674 | 0.230717 | 0 | 0.230717 | 0.256014 | 0.256014 |
| 5 | 0.215082 | 0.0675546 | 18.2331 | C&D Waste | 0 | 28 | 0.0943365 | 0.15048 | 0.283012 | 0 | 0.283012 | 0.314088 | 0.314088 |
| 6 | 0.215082 | 0.0785803 | 18.2583 | C&D Waste | 0 | 28 | 0.109717 | 0.175014 | 0.329154 | 0 | 0.329154 | 0.365351 | 0.365351 |
| 7 | 0.215082 | 0.0881402 | 18.2834 | C&D Waste | 0 | 28 | 0.123047 | 0.196277 | 0.369144 | 0 | 0.369144 | 0.409799 | 0.409799 |
| 8 | 0.215082 | 0.0962337 | 18.3086 | C&D Waste | 0 | 28 | 0.134326 | 0.214269 | 0.402982 | 0 | 0.402982 | 0.447429 | 0.447429 |
| 9 | 0.215082 | 0.10286 | 18.3338 | C&D Waste | 0 | 28 | 0.143555 | 0.22899 | 0.430667 | 0 | 0.430667 | 0.478238 | 0.478238 |
| 10 | 0.215082 | 0.108019 | 18.359 | C&D Waste | 0 | 28 | 0.150732 | 0.240439 | 0.452201 | 0 | 0.452201 | 0.502223 | 0.502223 |
| 11 | 0.215082 | 0.111709 | 18.3842 | C&D Waste | 0 | 28 | 0.155859 | 0.248617 | 0.467582 | 0 | 0.467582 | 0.519381 | 0.519381 |
| 12 | 0.215082 | 0.113931 | 18.4094 | C&D Waste | 0 | 28 | 0.158935 | 0.253524 | 0.476808 | 0 | 0.476808 | 0.529708 | 0.529708 |
| 13 | 0.215082 | 0.114682 | 18.4347 | C&D Waste | 0 | 28 | 0.15996 | 0.255159 | 0.479883 | 0 | 0.479883 | 0.533202 | 0.533202 |
| 14 | 0.215082 | 0.113964 | 18.4599 | C&D Waste | 0 | 28 | 0.158935 | 0.253524 | 0.476809 | 0 | 0.476809 | 0.529865 | 0.529865 |
| 15 | 0.215082 | 0.111775 | 18.4851 | C&D Waste | 0 | 28 | 0.155859 | 0.248617 | 0.467581 | 0 | 0.467581 | 0.519685 | 0.519685 |
| 16 | 0.215082 | 0.108114 | 18.5103 | C&D Waste | 0 | 28 | 0.150732 | 0.240438 | 0.4522 | 0 | 0.4522 | 0.502664 | 0.502664 |
| 17 | 0.215082 | 0.10298 | 18.5355 | C&D Waste | 0 | 28 | 0.143554 | 0.228989 | 0.430666 | 0 | 0.430666 | 0.478797 | 0.478797 |
| 18 | 0.215082 | 0.0963744 | 18.5608 | C&D Waste | 0 | 28 | 0.134326 | 0.214268 | 0.40298 | 0 | 0.40298 | 0.448083 | 0.448083 |
| 19 | 0.215082 | 0.0882948 | 18.586 | C&D Waste | 0 | 28 | 0.123046 | 0.196276 | 0.369142 | 0 | 0.369142 | 0.410518 | 0.410518 |
| 20 | 0.215082 | 0.0787411 | 18.6113 | C&D Waste | 0 | 28 | 0.109716 | 0.175013 | 0.329151 | 0 | 0.329151 | 0.366099 | 0.366099 |
| 21 | 0.215082 | 0.0677125 | 18.6365 | C&D Waste | 0 | 28 | 0.0943353 | 0.150478 | 0.283008 | 0 | 0.283008 | 0.314822 | 0.314822 |
| 22 | 0.215082 | 0.0552084 | 18.6617 | C&D Waste | 0 | 28 | 0.0769036 | 0.122672 | 0.230713 | 0 | 0.230713 | 0.256686 | 0.256686 |
| 23 | 0.215082 | 0.0412282 | 18.687 | C&D Waste | 0 | 28 | 0.0574212 | 0.0915949 | 0.172265 | 0 | 0.172265 | 0.191686 | 0.191686 |
| 24 | 0.215082 | 0.0257712 | 18.7122 | C&D Waste | 0 | 28 | 0.0358879 | 0.0572463 | 0.107665 | 0 | 0.107665 | 0.11982 | 0.11982 |
| 25 | 0.215082 | 0.0088367 | 18.7375 | C&D Waste | 0 | 28 | 0.0123038 | 0.0196263 | 0.0369117 | 0 | 0.0369117 | 0.0410853 | 0.0410853 |

In Waste - CC Block Non-Circular

Global Minimum Query (spencer) - Safety Factor: 1.59513

| Slice Number | Width [ft] | Weight [lbs] | Angle of Slice Base [deg] | Base Material | Base Cohesion [psf] | Base Friction Angle [deg] | Shear Stress [psf] | Shear Strength [psf] | Base Normal Stress [psf] | Pore Pressure [psf] | Effective Normal Stress [psf] | Base Vertical Stress [psf] | Effective Vertical Stress [psf] |
|--------------|------------|--------------|---------------------------|---------------|---------------------|---------------------------|--------------------|----------------------|--------------------------|---------------------|-------------------------------|----------------------------|---------------------------------|
| 1 | 5.73161 | 0.0268896 | 18.4337 | C&D Waste | 0 | 28 | 0.0014074 5 | 0.0022450 6 | 0.0042223 4 | 0 | 0.0042223 4 | 0.0046914 5 | 0.0046914 5 |
| 2 | 5.73161 | 0.0806688 | 18.4337 | C&D Waste | 0 | 28 | 0.0042223 4 | 0.0067351 8 | 0.012667 | 0 | 0.012667 | 0.0140744 | 0.0140744 |
| 3 | 5.73161 | 0.134448 | 18.4337 | C&D Waste | 0 | 28 | 0.0070372 3 | 0.0112253 | 0.0211118 | 0 | 0.0211118 | 0.0234574 | 0.0234574 |
| 4 | 5.73161 | 0.188227 | 18.4337 | C&D Waste | 0 | 28 | 0.0098521 1 | 0.0157154 | 0.0295564 | 0 | 0.0295564 | 0.0328402 | 0.0328402 |
| 5 | 1.92354 | 0.0752187 | 18.4337 | C&D Waste | 0 | 28 | 0.0117313 | 0.018713 | 0.0351941 | 0 | 0.0351941 | 0.0391042 | 0.0391042 |
| 6 | 5.91713 | 0.26928 | 18.4337 | C&D Waste | 0 | 28 | 0.0136527 | 0.0217778 | 0.0409581 | 0 | 0.0409581 | 0.0455087 | 0.0455087 |
| 7 | 5.91713 | 0.32646 | 18.4337 | C&D Waste | 0 | 28 | 0.0165518 | 0.0264022 | 0.0496553 | 0 | 0.0496553 | 0.0551722 | 0.0551722 |
| 8 | 5.91713 | 0.383641 | 18.4337 | C&D Waste | 0 | 28 | 0.0194508 | 0.0310266 | 0.0583524 | 0 | 0.0583524 | 0.0648355 | 0.0648355 |
| 9 | 5.91713 | 0.440821 | 18.4337 | C&D Waste | 0 | 28 | 0.0223499 | 0.035651 | 0.0670497 | 0 | 0.0670497 | 0.0744991 | 0.0744991 |
| 10 | 5.91713 | 0.498001 | 18.4337 | C&D Waste | 0 | 28 | 0.025249 | 0.0402754 | 0.0757469 | 0 | 0.0757469 | 0.0841626 | 0.0841626 |
| 11 | 5.91713 | 0.555181 | 18.4337 | C&D Waste | 0 | 28 | 0.028148 | 0.0448997 | 0.0844441 | 0 | 0.0844441 | 0.0938261 | 0.0938261 |
| 12 | 5.44742 | 0.520618 | 18.4358 | C&D Waste | 0 | 28 | 0.0286713 | 0.0457344 | 0.0860139 | 0 | 0.0860139 | 0.0955714 | 0.0955714 |
| 13 | 5.44742 | 0.486992 | 18.4358 | C&D Waste | 0 | 28 | 0.0268194 | 0.0427805 | 0.0804584 | 0 | 0.0804584 | 0.0893987 | 0.0893987 |
| 14 | 5.44742 | 0.453366 | 18.4358 | C&D Waste | 0 | 28 | 0.0249676 | 0.0398266 | 0.074903 | 0 | 0.074903 | 0.0832259 | 0.0832259 |
| 15 | 6.99322 | 0.532642 | 18.4359 | C&D Waste | 0 | 28 | 0.0228495 | 0.0364479 | 0.0685485 | 0 | 0.0685485 | 0.0761653 | 0.0761653 |
| 16 | 6.99322 | 0.477058 | 18.4359 | C&D Waste | 0 | 28 | 0.020465 | 0.0326444 | 0.0613951 | 0 | 0.0613951 | 0.0682172 | 0.0682172 |
| 17 | 6.99322 | 0.421474 | 18.4359 | C&D Waste | 0 | 28 | 0.0180805 | 0.0288408 | 0.0542417 | 0 | 0.0542417 | 0.0602688 | 0.0602688 |
| 18 | 6.99322 | 0.36589 | 18.4359 | C&D Waste | 0 | 28 | 0.0156961 | 0.0250373 | 0.0470884 | 0 | 0.0470884 | 0.0523207 | 0.0523207 |
| 19 | 6.99322 | 0.310306 | 18.4359 | C&D Waste | 0 | 28 | 0.0133116 | 0.0212338 | 0.0399349 | 0 | 0.0399349 | 0.0443724 | 0.0443724 |
| 20 | 5.88715 | 0.218135 | 18.4359 | C&D Waste | 0 | 28 | 0.0111157 | 0.017731 | 0.0333473 | 0 | 0.0333473 | 0.0370527 | 0.0370527 |
| 21 | 5.88715 | 0.178743 | 18.4359 | C&D Waste | 0 | 28 | 0.0091084 1 | 0.0145291 | 0.0273252 | 0 | 0.0273252 | 0.0303615 | 0.0303615 |
| 22 | 5.88715 | 0.139351 | 18.4359 | C&D Waste | 0 | 28 | 0.0071010 5 | 0.0113271 | 0.0213032 | 0 | 0.0213032 | 0.0236704 | 0.0236704 |
| 23 | 5.88715 | 0.0999588 | 18.4359 | C&D Waste | 0 | 28 | 0.0050937 1 | 0.0081251 3 | 0.0152811 | 0 | 0.0152811 | 0.0169791 | 0.0169791 |
| 24 | 5.99767 | 0.0613272 | 18.4359 | C&D Waste | 0 | 28 | 0.0030675 3 | 0.0048931 1 | 0.0092026 | 0 | 0.0092026 | 0.0102252 | 0.0102252 |
| 25 | 5.99767 | 0.0204424 | 18.4359 | C&D Waste | 0 | 28 | 0.0010225 1 | 0.0016310 4 | 0.0030675 3 | 0 | 0.0030675 3 | 0.0034083 8 | 0.0034083 8 |

Interslice Data

◆ Group 1 - CC Circular

Global Minimum Query (spencer) - Safety Factor: 1.71319

| Slice Number | X coordinate [ft] | Y coordinate - Bottom [ft] | Interslice Normal Force [lbs] | Interslice Shear Force [lbs] | Interslice Force Angle [deg] |
|--------------|-------------------|----------------------------|-------------------------------|------------------------------|------------------------------|
| 1 | 265.67 | 709.342 | 0 | 0 | 0 |
| 2 | 278.982 | 709.415 | 1439.1 | 433.169 | 16.7518 |
| 3 | 292.294 | 709.766 | 2865.07 | 862.387 | 16.7518 |
| 4 | 305.606 | 710.394 | 4037.34 | 1215.24 | 16.7518 |
| 5 | 320.143 | 711.397 | 4693.27 | 1412.68 | 16.7519 |
| 6 | 334.68 | 712.733 | 6066.22 | 1825.93 | 16.7518 |
| 7 | 349.217 | 714.405 | 7907.97 | 2380.3 | 16.7518 |
| 8 | 363.754 | 716.415 | 10000.5 | 3010.15 | 16.7518 |
| 9 | 378.291 | 718.765 | 12154.4 | 3658.47 | 16.7518 |
| 10 | 392.828 | 721.461 | 14207.5 | 4276.45 | 16.7518 |
| 11 | 407.365 | 724.506 | 16023.9 | 4823.22 | 16.7519 |
| 12 | 421.902 | 727.906 | 17493.5 | 5265.55 | 16.7518 |
| 13 | 436.439 | 731.666 | 18530.6 | 5577.73 | 16.7518 |
| 14 | 450.976 | 735.793 | 19074.6 | 5741.45 | 16.7518 |
| 15 | 465.513 | 740.295 | 19088.9 | 5745.75 | 16.7518 |
| 16 | 480.05 | 745.18 | 18561.7 | 5587.08 | 16.7518 |
| 17 | 494.587 | 750.457 | 17506.1 | 5269.35 | 16.7518 |
| 18 | 509.124 | 756.136 | 15960.7 | 4804.18 | 16.7518 |
| 19 | 523.661 | 762.23 | 13990.4 | 4211.11 | 16.7518 |
| 20 | 538.198 | 768.752 | 11687.5 | 3517.95 | 16.7519 |
| 21 | 552.735 | 775.715 | 9173.68 | 2761.28 | 16.7518 |
| 22 | 567.272 | 783.137 | 6601.2 | 1986.96 | 16.7518 |
| 23 | 581.809 | 791.035 | 4155.78 | 1250.89 | 16.7518 |
| 24 | 596.346 | 799.43 | 2059.31 | 619.854 | 16.7518 |
| 25 | 610.883 | 808.345 | 573.454 | 172.61 | 16.7518 |
| 26 | 625.42 | 817.807 | 0 | 0 | 0 |

◆ Group 1 - CC Block Non-Circular

Global Minimum Query (spencer) - Safety Factor: 1.66923

| Slice Number | X coordinate [ft] | Y coordinate - Bottom [ft] | Interslice Normal Force [lbs] | Interslice Shear Force [lbs] | Interslice Force Angle [deg] |
|--------------|-------------------|----------------------------|-------------------------------|------------------------------|------------------------------|
| 1 | 266.666 | 709.652 | 0 | 0 | 0 |
| 2 | 281.123 | 710.16 | 1332.33 | 410.986 | 17.1435 |
| 3 | 295.579 | 710.668 | 2525.88 | 779.16 | 17.1435 |
| 4 | 305.001 | 710.999 | 3179.7 | 980.846 | 17.1435 |
| 5 | 324.492 | 711.685 | 4309.42 | 1329.33 | 17.1435 |
| 6 | 338.345 | 714.367 | 5054.97 | 1559.31 | 17.1435 |
| 7 | 352.198 | 717.048 | 6013.35 | 1854.94 | 17.1434 |
| 8 | 366.05 | 719.73 | 7184.57 | 2216.23 | 17.1435 |
| 9 | 383.797 | 724.341 | 7965.16 | 2457.02 | 17.1435 |
| 10 | 401.543 | 728.952 | 8828.73 | 2723.41 | 17.1435 |
| 11 | 418.693 | 733.891 | 9288.99 | 2865.38 | 17.1435 |
| 12 | 435.842 | 738.829 | 9773.74 | 3014.92 | 17.1435 |
| 13 | 452.991 | 743.767 | 10283 | 3172 | 17.1434 |
| 14 | 470.14 | 748.706 | 10816.7 | 3336.65 | 17.1435 |
| 15 | 488.433 | 753.973 | 11413.1 | 3520.6 | 17.1434 |
| 16 | 501.534 | 758.213 | 11341.7 | 3498.58 | 17.1435 |
| 17 | 514.635 | 762.453 | 11269.8 | 3476.41 | 17.1435 |
| 18 | 527.737 | 766.693 | 11197.5 | 3454.09 | 17.1434 |
| 19 | 547.389 | 773.508 | 10602.8 | 3270.66 | 17.1435 |
| 20 | 567.041 | 780.324 | 10016.7 | 3089.88 | 17.1436 |
| 21 | 588.965 | 788.091 | 9210.44 | 2841.15 | 17.1435 |
| 22 | 610.838 | 796.14 | 8143.99 | 2512.19 | 17.1435 |
| 23 | 634.862 | 806.866 | 5532.58 | 1706.64 | 17.1435 |
| 24 | 654.64 | 816.215 | 3430 | 1058.06 | 17.1435 |
| 25 | 675.508 | 828.209 | 1003.28 | 309.484 | 17.1435 |
| 26 | 696.376 | 840.203 | 0 | 0 | 0 |

◆ Group 2 - CC Circular Seismic

Global Minimum Query (spencer) - Safety Factor: 1.53432

| Slice Number | X coordinate [ft] | Y coordinate - Bottom [ft] | Interslice Normal Force [lbs] | Interslice Shear Force [lbs] | Interslice Force Angle [deg] |
|--------------|-------------------|----------------------------|-------------------------------|------------------------------|------------------------------|
| 1 | 265.67 | 709.342 | 0 | 0 | 0 |
| 2 | 278.982 | 709.415 | 1548.44 | 466.082 | 16.7518 |
| 3 | 292.294 | 709.766 | 3080.27 | 927.163 | 16.7518 |
| 4 | 305.606 | 710.394 | 4355.69 | 1311.06 | 16.7518 |
| 5 | 320.143 | 711.397 | 5021.58 | 1511.5 | 16.7518 |
| 6 | 334.68 | 712.733 | 6413.21 | 1930.38 | 16.7518 |
| 7 | 349.217 | 714.405 | 8276.94 | 2491.36 | 16.7518 |
| 8 | 363.754 | 716.415 | 10390.6 | 3127.56 | 16.7517 |
| 9 | 378.291 | 718.765 | 12561.5 | 3781.02 | 16.7518 |
| 10 | 392.828 | 721.461 | 14625.6 | 4402.31 | 16.7518 |
| 11 | 407.365 | 724.506 | 16445.6 | 4950.12 | 16.7518 |
| 12 | 421.902 | 727.906 | 17910.5 | 5391.06 | 16.7518 |
| 13 | 436.439 | 731.666 | 18934.9 | 5699.4 | 16.7518 |
| 14 | 450.976 | 735.793 | 19458.4 | 5856.98 | 16.7518 |
| 15 | 465.513 | 740.295 | 19445.5 | 5853.09 | 16.7518 |
| 16 | 480.05 | 745.18 | 18885.6 | 5684.56 | 16.7518 |
| 17 | 494.587 | 750.457 | 17793.2 | 5355.76 | 16.7518 |
| 18 | 509.124 | 756.136 | 16208.6 | 4878.8 | 16.7518 |
| 19 | 523.661 | 762.23 | 14198.5 | 4273.75 | 16.7518 |
| 20 | 538.198 | 768.752 | 11857.1 | 3568.99 | 16.7518 |
| 21 | 552.735 | 775.715 | 9307.64 | 2801.6 | 16.7518 |
| 22 | 567.272 | 783.137 | 6704.15 | 2017.95 | 16.7518 |
| 23 | 581.809 | 791.035 | 4233.67 | 1274.34 | 16.7519 |
| 24 | 596.346 | 799.43 | 2119.11 | 637.853 | 16.7518 |
| 25 | 610.883 | 808.345 | 622.641 | 187.415 | 16.7518 |
| 26 | 625.42 | 817.807 | 0 | 0 | 0 |

◆ Group 2 - CC Block Non-Circular Seismic

Global Minimum Query (spencer) - Safety Factor: 1.49736

| Slice Number | X coordinate [ft] | Y coordinate - Bottom [ft] | Interslice Normal Force [lbs] | Interslice Shear Force [lbs] | Interslice Force Angle [deg] |
|--------------|-------------------|----------------------------|-------------------------------|------------------------------|------------------------------|
| 1 | 266.666 | 709.652 | 0 | 0 | 0 |
| 2 | 285.836 | 710.323 | 1898.28 | 574.686 | 16.8432 |
| 3 | 305.005 | 710.995 | 3484.9 | 1055.02 | 16.8432 |
| 4 | 329.746 | 711.862 | 5338.76 | 1616.26 | 16.8432 |
| 5 | 346.997 | 715.316 | 6445.98 | 1951.46 | 16.8432 |
| 6 | 364.248 | 718.771 | 7851.03 | 2376.82 | 16.8432 |
| 7 | 379.889 | 722.333 | 8983.47 | 2719.66 | 16.8432 |
| 8 | 395.53 | 725.895 | 10262 | 3106.71 | 16.8431 |
| 9 | 411.171 | 729.457 | 11686.5 | 3537.98 | 16.8432 |
| 10 | 426.812 | 733.02 | 13257.1 | 4013.47 | 16.8432 |
| 11 | 442.388 | 738.012 | 13201.7 | 3996.69 | 16.8432 |
| 12 | 457.964 | 743.005 | 13145.7 | 3979.74 | 16.8432 |
| 13 | 473.54 | 747.997 | 13089.1 | 3962.6 | 16.8432 |
| 14 | 489.116 | 752.99 | 13031.9 | 3945.29 | 16.8432 |
| 15 | 504.692 | 757.982 | 12974.1 | 3927.79 | 16.8432 |
| 16 | 520.267 | 762.975 | 12915.8 | 3910.12 | 16.8431 |
| 17 | 535.843 | 767.968 | 12856.8 | 3892.27 | 16.8432 |
| 18 | 551.419 | 772.96 | 12797.2 | 3874.24 | 16.8432 |
| 19 | 567.533 | 779.517 | 11194.1 | 3388.9 | 16.8432 |
| 20 | 583.647 | 786.074 | 9687.98 | 2932.94 | 16.8432 |
| 21 | 599.761 | 792.631 | 8278.93 | 2506.36 | 16.8431 |
| 22 | 618.629 | 801.372 | 5949.39 | 1801.12 | 16.8432 |
| 23 | 637.496 | 810.113 | 3990.83 | 1208.18 | 16.8431 |
| 24 | 656.364 | 818.854 | 2403.25 | 727.56 | 16.8432 |
| 25 | 676.121 | 829.517 | 728.759 | 220.625 | 16.8432 |
| 26 | 695.879 | 840.18 | 0 | 0 | 0 |

◆ In Waste - CC Circular

Global Minimum Query (spencer) - Safety Factor: 1.59514

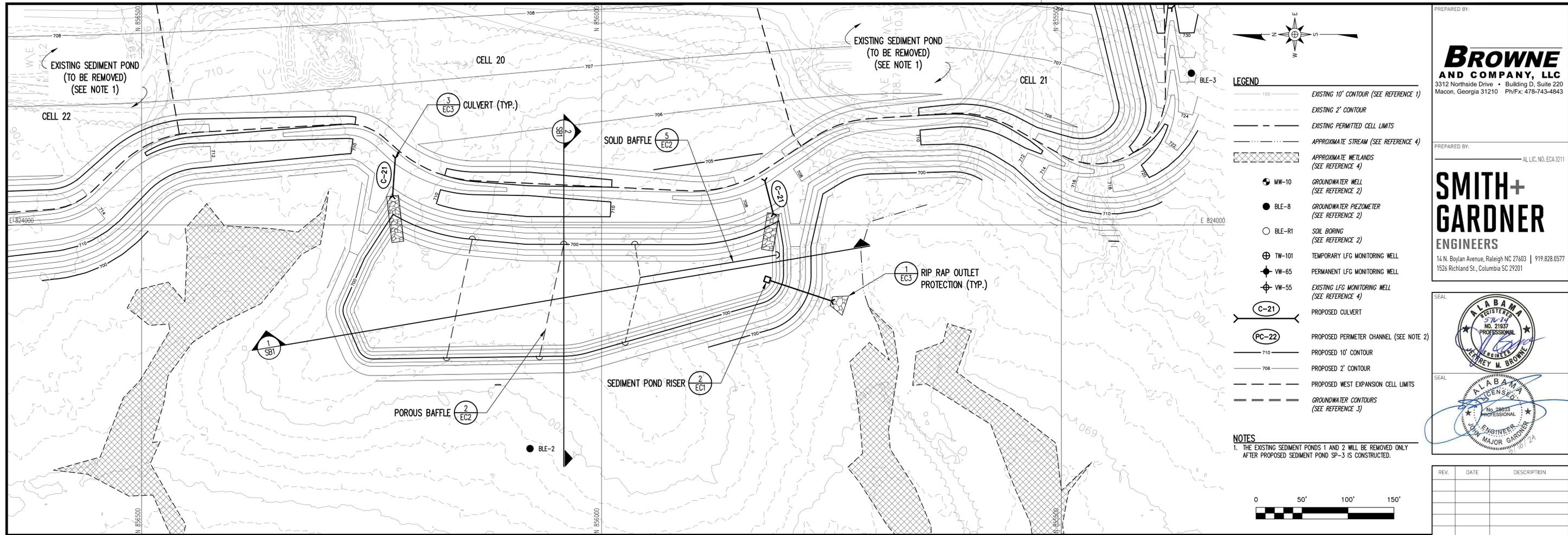
| Slice Number | X coordinate [ft] | Y coordinate - Bottom [ft] | Interslice Normal Force [lbs] | Interslice Shear Force [lbs] | Interslice Force Angle [deg] |
|--------------|-------------------|----------------------------|-------------------------------|------------------------------|------------------------------|
| 1 | 364.268 | 730.756 | 0 | 0 | 0 |
| 2 | 364.483 | 730.826 | 4.64943e-05 | 0 | 0 |
| 3 | 364.698 | 730.897 | 0.000170829 | 0 | 0 |
| 4 | 364.913 | 730.968 | 0.000351728 | 0 | 0 |
| 5 | 365.128 | 731.038 | 0.000569839 | 0 | 0 |
| 6 | 365.344 | 731.109 | 0.000807735 | 0 | 0 |
| 7 | 365.559 | 731.18 | 0.00104991 | 0 | 0 |
| 8 | 365.774 | 731.251 | 0.00128281 | 0 | 0 |
| 9 | 365.989 | 731.322 | 0.00149477 | 0 | 0 |
| 10 | 366.204 | 731.394 | 0.00167609 | 0 | 0 |
| 11 | 366.419 | 731.465 | 0.00181899 | 0 | 0 |
| 12 | 366.634 | 731.537 | 0.00191763 | 0 | 0 |
| 13 | 366.849 | 731.608 | 0.00196811 | 0 | 0 |
| 14 | 367.064 | 731.68 | 0.00196845 | 0 | 0 |
| 15 | 367.279 | 731.752 | 0.00191864 | 0 | 0 |
| 16 | 367.494 | 731.824 | 0.00182059 | 0 | 0 |
| 17 | 367.709 | 731.896 | 0.00167815 | 0 | 0 |
| 18 | 367.924 | 731.968 | 0.00149713 | 0 | 0 |
| 19 | 368.14 | 732.04 | 0.00128529 | 0 | 0 |
| 20 | 368.355 | 732.112 | 0.00105231 | 0 | 0 |
| 21 | 368.57 | 732.185 | 0.000809864 | 0 | 0 |
| 22 | 368.785 | 732.257 | 0.00057154 | 0 | 0 |
| 23 | 369 | 732.33 | 0.000352901 | 0 | 0 |
| 24 | 369.215 | 732.403 | 0.000171457 | 0 | 0 |
| 25 | 369.43 | 732.475 | 4.66803e-05 | 0 | 0 |
| 26 | 369.645 | 732.548 | 0 | 0 | 0 |

◆ In Waste - CC Block Non-Circular

Global Minimum Query (spencer) - Safety Factor: 1.59513

| Slice Number | X coordinate [ft] | Y coordinate - Bottom [ft] | Interslice Normal Force [lbs] | Interslice Shear Force [lbs] | Interslice Force Angle [deg] |
|--------------|-------------------|----------------------------|-------------------------------|------------------------------|------------------------------|
| 1 | 463.461 | 763.82 | 0 | 0 | 0 |
| 2 | 469.193 | 765.731 | 6.09503e-07 | 0 | 0 |
| 3 | 474.925 | 767.641 | 2.43801e-06 | 0 | 0 |
| 4 | 480.656 | 769.552 | 5.48553e-06 | 0 | 0 |
| 5 | 486.388 | 771.462 | 9.75204e-06 | 0 | 0 |
| 6 | 488.311 | 772.103 | 1.1455e-05 | 0 | 0 |
| 7 | 494.228 | 774.075 | 1.75442e-05 | 0 | 0 |
| 8 | 500.146 | 776.048 | 2.49263e-05 | 0 | 0 |
| 9 | 506.063 | 778.02 | 3.36015e-05 | 0 | 0 |
| 10 | 511.98 | 779.992 | 4.35697e-05 | 0 | 0 |
| 11 | 517.897 | 781.964 | 5.48309e-05 | 0 | 0 |
| 12 | 523.814 | 783.937 | 6.73851e-05 | 0 | 0 |
| 13 | 529.261 | 785.752 | 5.92166e-05 | 0 | 0 |
| 14 | 534.709 | 787.568 | 5.15758e-05 | 0 | 0 |
| 15 | 540.156 | 789.384 | 4.44625e-05 | 0 | 0 |
| 16 | 547.15 | 791.715 | 3.60802e-05 | 0 | 0 |
| 17 | 554.143 | 794.047 | 2.85727e-05 | 0 | 0 |
| 18 | 561.136 | 796.378 | 2.194e-05 | 0 | 0 |
| 19 | 568.129 | 798.709 | 1.61819e-05 | 0 | 0 |
| 20 | 575.122 | 801.04 | 1.12986e-05 | 0 | 0 |
| 21 | 581.01 | 803.003 | 7.86579e-06 | 0 | 0 |
| 22 | 586.897 | 804.965 | 5.05288e-06 | 0 | 0 |
| 23 | 592.784 | 806.928 | 2.85989e-06 | 0 | 0 |
| 24 | 598.671 | 808.89 | 1.28682e-06 | 0 | 0 |
| 25 | 604.669 | 810.889 | 3.21706e-07 | 0 | 0 |
| 26 | 610.666 | 812.889 | 0 | 0 | 0 |

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PREPARED BY:
BROWNE AND COMPANY, LLC
 3312 Northside Drive • Building D, Suite 220
 Macon, Georgia 31210 Ph/Fx: 478-743-4843

PREPARED BY:
SMITH+GARDNER ENGINEERS
 14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577
 1526 Richland St., Columbia SC 29201



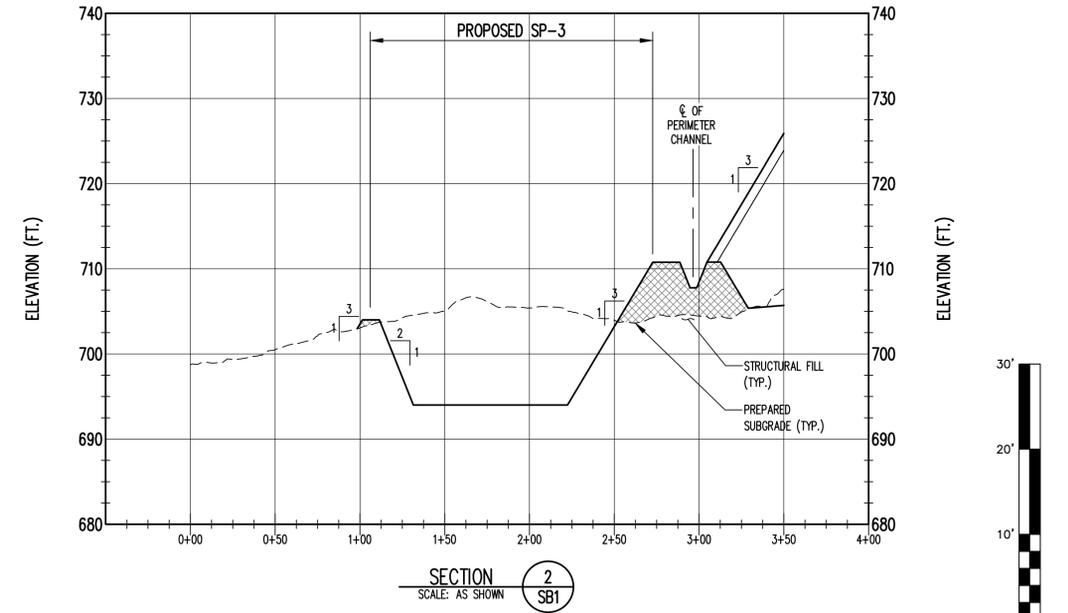
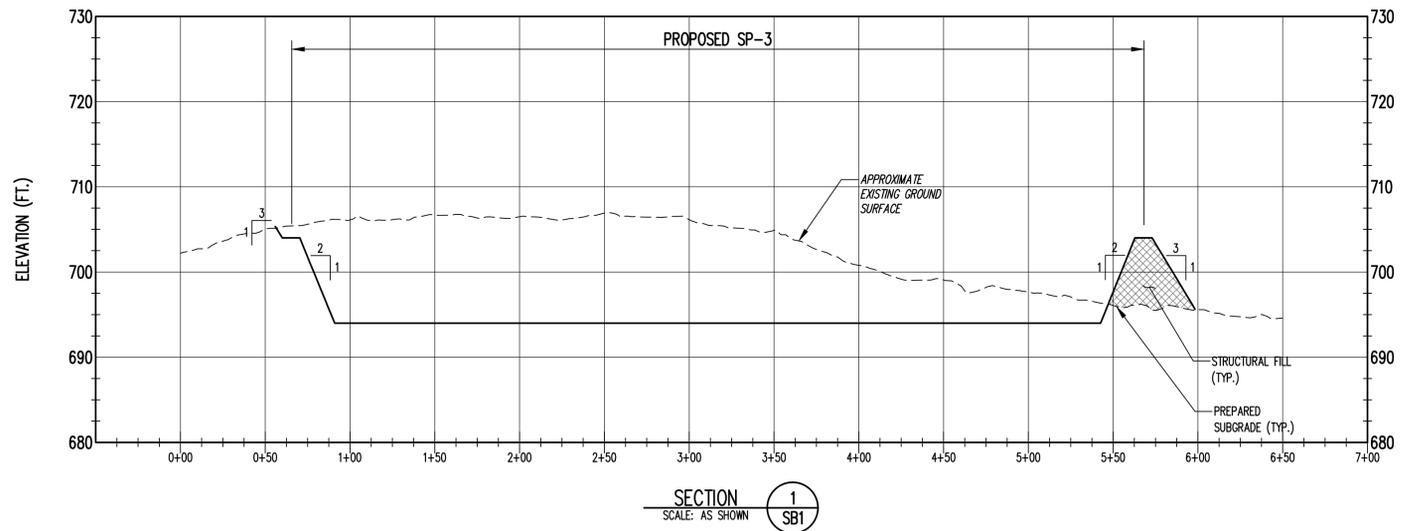
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- REFERENCES**
- AERIAL TOPOGRAPHY COMPILED BY BROWNE AND COMPANY, LLC AND PROVIDED VIA CHAMBERS CO 2022-01-24.DWG. TOPOGRAPHY IN ACTIVE AREAS FROM AERIAL SURVEY DATED JANUARY 31, 2024 BY SOUTHERN RESOURCES MAPPING, NORTHPORT, AL. ADDITIONAL TOPOGRAPHY FROM NOAA OFFICE FOR COASTAL MANAGEMENT, 2016 TO 2019 USGS LIDAR MAPPING.
 - BLE PIEZOMETERS SURVEYED BY WELLSTON ASSOCIATES LAND SURVEYORS, INC ON MAY 16, 2023. EXISTING MONITORING WELLS SURVEYED BY WELLSTON ASSOCIATES LAND SURVEYORS, INC ON MAY 22, 2023.
 - GROUNDWATER CONTOURS PROVIDED BY BUNNELL LAMMONS ENGINEERING BASED ON PIEZOMETER MEASUREMENTS ON VARIOUS DATES FROM APRIL 2023 TO APRIL 2024.
 - POTENTIAL WATERS OF THE STATE (I.E. WETLANDS AND STREAM LOCATIONS) PROVIDED BY INVER ENVIRONMENTAL CONSULTING, LLC OF WINSTON SALEM, NC BASED ON AN ON-FOOT SITE INSPECTION ON MARCH 16, 2023, USING THE U.S ARMY CORPS OF ENGINEERS (USACE) METHODOLOGIES DESCRIBED IN:
 - WETLAND DELINEATION MANUAL (1987)
 - EASTERN MOUNTAINS AND PIEDMONT REGIONAL SUPPLEMENT (VERSION 2.0, 2012)
 - REGULATORY GUIDANCE LETTER 05-05 (2005) AND
 - INTERIM NATIONAL ORDINARY HIGH MARK FIELD DELINEATION MANUAL (2022).
 - PROPERTY LINE FROM SURVEY PREPARED BY HENRY C. HAWKINS L.S. DATED FEBRUARY 12, 1992.

PERMIT ISSUE
NOT FOR CONSTRUCTION

LEGEND - SECTION

- EXISTING GROUND SURFACE (REFERENCE 1)
- PROPOSED GRADING SURFACE



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PROJECT TITLE:
FACILITY PERMIT DRAWINGS
CHAMBERS COUNTY
INDUSTRIAL LANDFILL
PERMIT NO. 09-02

DRAWING TITLE:
SEDIMENT BASIN SP-3
GRADING PLAN

DESIGNED: G.G.M. PROJECT NO: CHAMBERS 24-1
 DRAWN: C.T.J. SCALE: AS SHOWN
 APPROVED: J.M.G. DATE: MAY 2024
 FILENAME: CHAMBERS-D0007
 SHEET NUMBER: 8 DRAWING NUMBER: SB1

