



ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

SOLID WASTE DISPOSAL FACILITY PERMIT

PERMITTEE: Greenfield Environmental Multistate Trust, LLC, Trustee of the Multistate Environmental Response Trust

FACILITY NAME: Multistate Environmental Response Trust – Mobile Facility 10-acre Landfill

FACILITY LOCATION: Section 1 and 12, Township 6 South, Range 2 West and located in Mobile, Mobile County, AL. The permitted area consists of approximately 11 acres with a disposal area of 10 acres.

PERMIT NUMBER: 49-32

PERMIT TYPE: Industrial

WASTE APPROVED FOR DISPOSAL: Dry and/or pelletized iron oxide solids and industrial material waste contaminated with iron oxide

APPROVED WASTE VOLUME: Maximum Average Daily Volume of waste is 1,100 cubic yards per day

APPROVED SERVICE AREA: The former Tronox LLC Mobile Facility in Theodore, Mobile County, Alabama

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: ??????????????????

EFFECTIVE DATE: ??????????????????

EXPIRATION DATE: ??????????????????

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

Permittee: Greenfield Environmental Multistate Trust, LLC, Trustee of the Multistate Environmental Response Trust
11 Flagg Street, Unit 1
Cambridge, Massachusetts 02138

Landfill Name: Multistate Environmental Response Trust – Mobile Facility 10-acre Landfill

Landfill Location: Sections 1 and 12, Township 6 South, Range 2 West on Highway 193 in the Mobile, Mobile County, Alabama.

Permit Number: 49-32

Landfill Type: Industrial Landfill

Pursuant to the Alabama Solid Wastes & 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 Greenfield Environmental Multistate Trust, LLC, Trustee of the Multistate Environmental Response Trust. (hereinafter called the Permittee), to operate a solid waste disposal facility, known as the Multistate Environmental Response Trust - Mobile Facility 10-acre 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 335-13-15 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 February 28, 2019, and as amended for permit renewal and name change, 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 ??????????????????, and shall remain in effect until ??????????????????, 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 Div. 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 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 Division 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, other than noncompliance authorized by a variance, 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 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.E.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 Chapter 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.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 90 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

The Permittee may not commence disposal of waste in any new cell or phase until the Permittee has submitted to the Department, by certified mail or hand delivery, a letter signed by both the Permittee and a professional engineer stating that the facility has been constructed in compliance with the permit.

The Department must inspect the constructed cells or phases before the owner or operator can commence waste disposal unless the Permittee is notified that the Department will waive the inspection.

13. Compliance Schedules

Reports of compliance or noncompliance with or any progress reports on interim and final requirements contained in any compliance schedule required and approved by the Department shall be submitted no later than 14 days following each schedule date.

14. Other Noncompliance

The Permittee shall report all instances of noncompliance with the permit at the time monitoring reports are submitted.

15. 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 Division 13.
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.I. The operating record shall include:
 - a. Documentation of inspections and maintenance activities.
 - b. Daily Volume reports.
 - c. Personnel training documents and records.
 - d. Solid/Hazardous Waste Determination Forms for Industrial Wastes, and the associated Department disposal approval correspondence for industrial waste and special waste.
 - e. Groundwater monitoring records.
 - f. Explosive gas monitoring records.
 - g. Surface water and leachate monitoring records. Monitoring is subject to applicable conditions of Section VI. of the permit.
 - h. Copies of this Permit and the Application.

- i. 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. The Permittee is granted a variance from Rule 335-13-4-.23(2)(f) requiring quarterly volume reports. (See Section VIII.4.)

- 3. Monitoring and Corrective Action Reports

The Permittee shall submit reports on all monitoring and corrective activities conducted pursuant to the requirements of this permit, including but not limited to, groundwater, surface water, explosive gas and leachate monitoring. The groundwater monitoring shall be conducted in March and September of each year, or as directed by the Department, and the reports shall be submitted at least semi-annually, or as directed by the Department. The reports should contain all monitoring results and conclusions from samples and measurements conducted during the sampling period. Explosive gas monitoring must be submitted on an annual basis, and the reports should be submitted to the Department and placed in the operating record within 30 days of the monitoring event. Copies of the groundwater and explosive gas monitoring reports shall be maintained in the operating record (See Sections IV, V, VI, and VIII).

- 4. Availability, Retention, and Disposition of Records

- a. All records, including plans, required under this permit or Division 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 Division 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 Multistate Environmental Response Trust – Mobile Facility 10-acre Landfill office, the following documents and amendments, revisions and modifications to these documents until an engineer certifies closure of the permitted landfill.

- 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 to:

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

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 if the information is protected under Code of Alabama 1975, §§ 22-39-18, as amended.

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 Division 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 for the detecting and preventing the disposal of free liquids, regulated hazardous waste, PCB's, and medical waste 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.

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 III.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 Multistate Environmental Response Trust – Mobile Facility 10-acre Landfill is approximately 11 acres, with approximately 10 acres permitted for disposal operations.
3. The maximum average daily volume of waste disposed at the facility shall not exceed 1,100 cubic yards per day, except as provided under Rule 335-13-5-.06(2)(a)5. The average daily volume shall be computed as specified by Rule 335-13-5-.06(2)(a)5.(i).

B. Waste Streams

The Permittee may accept for disposal dry and/or pelletized iron oxide solids and industrial waste contaminated with iron oxide.

C. Service Area:

The Permittee is allowed to receive for disposal waste from the formerly Tronox LLC Mobile Facility in Mobile, Alabama.

D. Waste Placement, Compaction, and Cover

All waste shall be confined to an area as small as possible and placed onto an appropriate slope not to exceed 4 to 1 (25%) or as 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 cover. A minimum of six inches of compacted earth or other alternative cover material approved by the Department shall be added as needed by the landfill (See Section VIII, 1.).

E. Liner Requirements

The Permittee shall install a composite liner system which consists of a 30 mil Hypalon synthetic liner with an underlying 6 inch sand layer and underdrain system, underlain with a 2 foot thick compacted clay layer. The base of the composite liner system shall be a minimum of five (5) feet above the highest measured groundwater level.

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 Division 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 Rule 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. The Trust is permitted to recover and recycle some of the waste material already landfilled as stated in the approved Material Management and Shipping Plan for Former Tronox Facility (see Section VIII. 3.).

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 Rule 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:

The Trust is currently monitoring groundwater under NPDES No. AL0026328, issued by the Industrial Section of the ADEM Water Division. For the purpose of this Solid Waste Landfill Permit, the Permittee shall conduct groundwater monitoring consistent with NPDES permit no. AL0026328 and Rule 335-13-4-.27. Table IV.1 lists the semi-annual groundwater monitoring parameters to be analyzed.

TABLE IV.1.
SEMI-ANNUAL GROUNDWATER MONITORING PARAMETERS.

NOTE: The Permittee shall sample groundwater and analyze for pH, temperature, specific conductance, chloride, total dissolved solids, aluminum, beryllium, cadmium, chromium, iron, lead, manganese, nickel, zinc, and turbidity.

SECTION V. GAS MONITORING REQUIREMENTS

The Permittee is not required to conduct gas monitoring because the waste stream is not an organic material. If it is determined that gas monitoring is necessary, the Permittee must conduct gas monitoring in accordance with 335-13 (See Section VIII, 2.).

SECTION VI. LEACHATE AND SURFACE WATER MANAGEMENT REQUIREMENTS.

The Permittee must collect and dispose of the leachate that is generated at the facility. The Permittee shall install a leachate collection system designed to maintain less than 12 inches (30 cm) depth of leachate over the liner. Prior to initial disposal, the permittee shall provide the Department with a letter from the receiving publicly or privately owned treatment works, approving the acceptance of the leachate. Discharges to publicly or privately owned treatment works may be subject to the requirements of the ADEM Water Division's State Indirect Discharge (SID) Program. The permittee shall construct and maintain run-on and run-off control structures. Surface water discharges from drainage control structures shall be permitted through the ADEM Water Division's National Pollutant Discharge Elimination System (NPDES) Program

SECTION VII. CLOSURE AND POST-CLOSURE REQUIREMENTS

The Permittee shall close the landfill and perform post-closure care of the landfill in accordance with Division 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 Division 13.

B. Vegetative Cover

The Permittee shall establish a vegetative or other appropriate cover within 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 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 an 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 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. The Permittee shall reapply in order to fulfill the post-closure care requirements of this permit.

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 engineer, verifying the post-closure has been completed according to the Post-Closure Plan.

J. Notice in Deed to Property

The Permittee shall record a notation onto the land deed containing the property utilized for disposal within 90 days after permit expiration, revocation or when closure requirements are achieved as determined by the Department as stated in the Application. 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.

K. Recording Instrument

The Permittee shall submit a certified copy of the recording instrument to the Department within 120 days after permit expiration, revocation, or as directed by the Department as described in the Application.

L. 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 CONDITONS

1. Multistate Environmental Response Trust – Mobile Facility 10-acre Landfill is granted a variance from Rule 335-13-4-.15. The facility may cover as needed. (See Section III, D.)
2. A variance is granted for explosive gas monitoring due to the characteristics of the waste stream. The waste to be disposed is not an organic material. (See Section V)
3. A variance is granted from Rule 335-13-4.22(2)(a) regarding scavenging and salvaging. The permittee is granted permission to excavate, remove and ship of the previously landfill material off site in accordance with the approved Material Management and Shipping Plan for Former Tronox Facility and as explained in Section III.P. of the permit.
4. Since the manufacturing facility has been closed and is no longer producing waste, the Permittee is granted a variance from Rule 335-13-4.23(2)(f) requiring quarterly volume reports. (See Section I.H.2.)

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.

APPLICATION



February 27, 2019

Mr. Eric Sanderson
Alabama Department of Environmental Management
Land Division
Solid Waste Department
1400 Coliseum Boulevard
Montgomery, AL 36110-2400

**RE: Landfill Permit No.: 49-32
Solid Waste Permit Renewal
Greenfield Environmental Multistate Trust, LLC
Thompson Engineering No: 19-1101-0007**

Dear Mr. Sanderson:

Enclosed are three copies of the Permit Renewal Application for the 10-Acre Industrial Landfill (Permit No.: 49-32) for the Greenfield Environmental Multistate Trust, LLC Trustee of the Multistate Environmental Response Trust located in Mobile, Alabama. Also enclosed is Check No. 2407 for \$4,075 for the permit renewal fee.

If you have any questions, please call us at 251-666-2443.

Sincerely,

THOMPSON ENGINEERING, INC.

A handwritten signature in blue ink, appearing to read "D.L. Upton".

David L. Upton, P.E.
Senior Engineer

DLU/dlu:

File Name: Permit Transmittal to ADEM.docx

2970 Cottage Hill Road, Ste. 190
Mobile, AL 36606
251.666.2443 ph / 251.666.6422 fax
www.thompsonengineering.com

A THOMPSON HOLDINGS, INC. COMPANY



Greenfield Environmental Multistate Trust LLC
Trustee of the Multistate Environmental Response Trust
Greenfield Environmental Trust Group, Inc., Member
7300 Rangeline Rd, Theodore, AL 36582
(443) 603-3712
dd@g-etg.com

February 27, 2019

Alabama Department of Environmental Management
Attn: Land Division
1400 Coliseum Boulevard
Montgomery AL 36110

Mr. Stephan A. Cobb
Chief, Land Division
Alabama Department of Environmental Management
Land Division – Solid Waste Branch
Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7730

Re: Renewal Application for 10 Acre Industrial Landfill Permit No. 49-32

Dear Mr. Cobb,

Greenfield Environmental Multistate Trust, LLC, not individually but solely in its capacity as Trustee of the Multistate Environmental Response Trust (the Multistate Trust) is pleased to submit the attached application for the renewal of Industrial Landfill Permit 49-32 for the Multistate Trust's Theodore, Alabama property.

If you have any questions or require any additional information please do not hesitate to contact me at [425\) 281-9185](tel:4252819185)/tg@g-etg.com.

Sincerely,

Greenfield Environmental Multistate Trust LLC
Trustee of the Multistate Environmental Response Trust
By: Greenfield Environmental Trust Group, Inc., Member
By: David B. Dabney, Project Manager – The Multistate Trust

The Multistate Trust
February 27, 2019
Page 2 of 2

Attachment: Renewal Application for Industrial Landfill Permit 49-32 (3-copies)

Electronic cc:

C Brooks, President - Multistate Trust

T Griffith, Technical Specialist – The Multistate Trust

**PERMIT RENEWAL APPLICATION
SOLID WASTE DISPOSAL FACILITY
10-ACRE INDUSTRIAL LANDFILL
LANDFILL PERMT NO.: 49-32**

**GREENFIELD ENVIRONMENTAL MULTISTATE TRUST LLC,
TRUSTEE OF THE MULTISTATE ENVIRONMENTAL RESPONSE TRUST
MOBILE FACILITY
MOBILE, ALABAMA**

**SECTIONS 1 AND 12; T6S; R2W
MOBILE COUNTY, ALABAMA**

FEBRUARY 2019

Prepared for:



**GREENFIELD ENVIRONMENTAL MULTISTATE TRUST LLC,
TRUSTEE OF THE MULTISTATE ENVIRONMENTAL
RESPONSE TRUST
11 Flagg St, Unit 1
Cambridge, MA 02138**

**PERMIT RENEWAL APPLICATION
SOLID WASTE DISPOSAL FACILITY
10-ACRE INDUSTRIAL LANDFILL**

**GREENFIELD ENVIRONMENTAL MULTISTATE TRUST LLC,
TRUSTEE OF THE MULTISTATE ENVIRONMENTAL RESPONSE TRUST
MOBILE FACILITY
MOBILE, ALABAMA**

**SECTIONS 1 AND 12; T6S; R2W
MOBILE COUNTY, ALABAMA**

FEBRUARY 2019

Prepared for:

**GREENFIELD ENVIRONMENTAL MULTISTATE TRUST LLC,
TRUSTEE OF THE MULTISTATE ENVIRONMENTAL
RESPONSE TRUST
11 Flagg St, Unit 1
Cambridge, MA 02138**

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SOLID WASTE DISPOSAL FACILITY
MSWLF/ILF/CCR UNIT 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)
 CCR Landfill (CCRLF)
 CCR Surface Impoundment (CCRSI)
 Other (explain) _____

2. **Facility Name** Multistate Environmental Response Trust -Mobile Facility

3. **Applicant:**

Name: Greenfield Environmental Multistate Trust LLC, Trustee of the Multistate Environmental Response Trust

Address: 11 Flagg St, Unit 1
Cambridge, MA 02138

Telephone: 617-448-9762

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

Township 6S **Range** 2W
Section 1 and 12 **County** Mobile

5. **Land Owner:**

Name: Greenfield Environmental Multistate Trust LLC, Trustee of the Multistate Environmental Response Trust

Address: 11 Flagg St, Unit 1
Cambridge, MA 02138

Telephone: 617-448-9762

(Attach copy of agreement from landowner if applicable.)

Solid Waste Permit Application
Page 2

6. Contact Person:

Name David Dabney

Position or Affiliation Site Manager, Greenfield Environmental Multistate Trust, LLC

Address: 7300 Rangeline Road
Mobile, AL 36582

Telephone: (443) 603-3712

7. Size of Facility:

11 **Acres**

Size of Disposal Area(s):

10 **Acres**

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

Greenfield Environmental Multistate Trust LLC, Trustee of the Multistate Environmental Response Trust

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

 Tons/Day 1,100 **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.):

The industrial landfill facility was used to dispose of dry and/or Pelletized Iron Oxide Solids. The 10-acre landfill will be
used to dispose of waste materials contaminated with solid iron oxide residue.



Greenfield Environmental Multistate Trust, LLC
Trustee of the Multistate Environmental Response Trust
By: Greenfield Environmental Trust Group, Inc.
By: Cynthia Brooks, President - Trustee of the Multistate
Environmental Response Trust

February 27, 2019

SIGNATURE

DATE

ADDITIONAL REQUIRED INFORMATION

Applicants seeking to obtain a permit to construct and/or continue to operate a municipal solid waste (MSW) landfill, industrial 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. 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.

DATA TO BE SUBMITTED ON ALL LANDFILLS REQUIRING A GEOLOGICAL EVALUATION

The following items must be submitted along with the permit application. This data is necessary for ADEM to determine if the proposed landfill site is suitable from a geological standpoint.

- a. Conduct a water well survey to a minimum of 1 mile from the perimeter of the proposed landfill or expansion.
 1. Locate water wells on a USGS 7.5 minute topographic map.
 2. Provide corresponding names and addresses of well owners.
 3. Determine the depth of the well and the static water level. Specify whether these data were determined by measurement or interview.
- b. Conduct borings and/or pit excavations to establish site geology and hydrology at least to the mean annual water table or bedrock.
 1. Locate soil borings or excavation pits on a USGS 7.5 minute topographic map.
 2. Provide a log of excavation which includes the following:
 - Foot by foot soil classification by the Unified Soil Classification System (USCS).
 - Elevation at which groundwater or bedrock was observed.
 - Elevation of groundwater after 24 hours.
- c. Sample soil material from test borings or pit excavations for the following tests:
 1. Proctor density 90%-95% for liner material, 85%-90% for cover material.
 2. Permeability in cm/sec at the item (1) densities.
- d. Construct the following maps:
 1. Potentiometric map using general elevations established after 24 hours.
 2. Regional map to a minimum of 1 mile from the perimeter indicating geology, structural features such as faults, etc.
 3. Cross sections using borings and/or excavation pits of site.
- e. Any additional information deemed necessary to properly evaluate the site.

1.0 INTRODUCTION AND GENERAL INFORMATION

The Greenfield Environmental Multistate Trust LLC, Trustee of the Multistate Environmental Response Trust (the Multistate Trust) Mobile Facility (formerly Kerr McGee Chemical, LLC then Tronox LLC) is located in Mobile County, Alabama, in Sections 1 and 12, Township 6 South, Range 2 West. The facility was built in the mid-1970's and is situated within the Theodore Industrial Park, an area developed mostly from Federal government properties comprising the Hollinger's Island Army Ammunition Depot. The Multistate Trust facility is bounded by Rangeline Road / Hwy 193 (east), Theodore Industrial Barge Canal (south), a railroad right-of-way owned by the Alabama State Port Authority and other industrial properties (north), and a utility corridor owned by the Industrial Development Board (west). North of the railroad right-of-way in the vicinity of the 10-acre industrial landfill is a former oil refinery property (Gammex Energy/Marion Oil). South of the barge canal and east of Hwy 193 are industrial properties. The western portion of the Multistate Trust property is low-lying, undeveloped land. Figure 1 (Site Vicinity Map) displays predominant locational and topographic vicinity characteristics. Figure 2 displays ownership of properties bordering the Multistate Trust facility boundaries.

When the facility was operational, the Mobile Facility produced synthetic rutile by a process classified as ore beneficiation, which involved the treatment of a lower grade iron-titanium ore (ilmenite) through heat treatment and acid leaching of contained iron compounds. The synthetic rutile was shipped primarily to a Hamilton, Mississippi facility where high purity pigment grade titanium dioxide was produced.

The ore beneficiation process producing synthetic rutile generated an iron oxide by-product material requiring management. The original facility design in the mid-1970's included a 19-acre settling impoundment for slurried iron oxide solids, which was constructed in the north-central portion of the facility's property boundaries, northwest of the process area. The 10-acre iron oxide impoundment was constructed in 1984 to the west of the 19-acre Impoundment, sharing a common dike. In 1991, the 27-acre Impoundment was constructed west of the 10-acre Impoundment, similarly sharing a common dike. The 10-acre Impoundment and 27-acre Impoundment were used for the same purpose as the original 19-acre Impoundment; i.e., as settling impoundments for slurried iron oxide solids. In 1998, the 2-acre Impoundment was constructed south of the 10-acre Impoundment, sharing a common dike. The 2-acre Impoundment was constructed primarily to serve as a surge pond for extreme rainfall events. In December 2001, the 10-acre Impoundment was taken out of liquid service and converted to an industrial landfill permitted by the Alabama Department of Environmental Management (ADEM) Solid Waste Branch. Figure 3 displays the relative locations of the four impoundments. All impoundments have been regulated by the ADEM as process wastewater surface impoundments under the facility's NPDES permit. The return flow, after settling out of the iron oxide

solids, was routed back to process and/or wastewater treatment facilities and eventually discharged as part of the Plant's treated wastewater effluent (DSN 001).

Over the years, Tronox and Kerr McGee had instituted measures to reduce the volume of slurried iron oxide solids requiring treatment in settling impoundments. In the late 1980's a dryer/pelletizer unit was installed which converted a portion of the iron oxide by-product to a dry state, where it could be managed by conventional handling and transport equipment. After the iron oxide was converted to the pelletized form, dump trucks were used to transport the material to the landfill area. All haul roads for transporting the material are improved and lie totally within the Multistate Trust facility boundaries (i.e., no transport over public roadways required).

Marketing of this dry iron oxide by-product material for re-use in various manufacturing processes was marginally successful during the timeframe that Kerr McGee and Tronox operated the facility. Although historic efforts showed promise to increase the beneficial re-use of this material, it had been necessary to provide an area for interim storage and/or disposal of the dry iron oxide by-product material. The former 19-acre Impoundment was initially converted for such purpose in 1989 when an interim storage area was built on top of stabilized settling pond deposits. In 1993, ADEM required that a final closure plan be developed for the former 19-acre Impoundment. As part of the approved closure plan, initiated in 1994, dry iron oxide solids were used as fill to attain desired final grade elevations for the permanent cap. The former 19-acre Impoundment was closed in 2002 and the 10-acre impoundment was taken out of liquid service and converted to an industrial landfill (permit number 49-32) by the ADEM Solid Waste Branch. This permit was transferred to the Multistate Trust on May 24, 2011.

The only materials that have been placed in the 10-acre Industrial Landfill are dry iron oxide solids generated at the Mobile, Mobile County, Alabama facility. These include excess pelletized iron oxide solids as heretofore described, as well as iron oxide solids excavated from the adjacent 27-acre settling impoundment. At present, the 27-acre Impoundment will continue to be used for storm water collection and for settling iron oxide solids that may still be present on the site as it is cleaned up.

When the facility was operational, the amount of dry iron oxide solids generated at the facility for placement in the 10-acre Landfill varied, depending on production, efficiency of the pelletizer, marketability of the by-product material, and the volume of material which is excavated from the 27-acre Impoundment. The Multistate Trust requests that these volumes remain unchanged for the renewed permit. The landfill is currently permitted for 1,100 cubic yards of iron oxide solids per day.

Descriptive information and test results collected by Kerr McGee/Tronox for the dry iron oxide solids placed in the 10-acre Industrial Landfill were included in the previous permit applications. The physical state of the material was reported as 100% solid, with no free liquids or semi-solids. Chemically, it was reported as comprised predominantly (80 – 90%) of iron oxide (ferric oxide), with other major constituents being magnesium oxide (2 – 5%), aluminum oxide (2 – 5%), titanium dioxide (1 – 3%), manganese (III) oxide (2 – 5%), and inorganic chlorides (1.5 – 5%). The pH of the material (10g per 100ml DI water) is reportedly approximately 4. The Toxicity Characteristic Leachate Procedure (TCLP) test results of the iron oxide material for all constituents were below hazardous waste MCLs. Additionally, TCLP results indicated minimum leachability (i.e., below analytical detection limits) for all volatiles, semi-volatiles, and most metals. One TCLP metal (Barium) was above analytical detection limits, but was less than 10% of its hazardous waste Maximum Contaminate Level (MCL).

Defining the specific landfill boundaries as the dikes, the total landfill area is approximately 11 acres. The effective area for disposal equals approximately 10 acres. A buffer zone around the landfill area is provided by the surrounding lands owned by the Multistate Trust. Since the landfill boundaries are completely surrounded by the facility boundaries, the Multistate Trust is the only landowner strictly adjacent to the industrial landfill. Adjacent property owners to the Multistate Trust facility boundaries are shown on Figure 2. At its closest location (to the north), the Multistate Trust property line is about 430 feet from the industrial landfill boundary. The specific boundaries for the 10-acre Landfill lie within Sections 1 and 12, Township 6 South, Range 2 West in Mobile County, Alabama. Available boundary survey information related to the industrial landfill are included in Attachment II.

In 1984, the original 10-acre Impoundment was constructed with dike elevations at +31-feet NGVD (nominal). The construction included a bottom liner system comprised of 2 feet of compacted clay, a 6-inch sand layer above the clay, and an uppermost synthetic plastic liner (30-mil Hypalon). A 4-inch perforated PVC underdrain pipe was constructed in the 6-inch sand layer for leak detection/collection. The underdrain piping originally drained to a sample point located centrally along the south dike. It was later connected directly to a manhole southeast of the 10-acre Impoundment which is part of a French drain groundwater collection system (discussed in next paragraph). Design information (BCM Engineers) pertaining to the original 10-acre Impoundment construction has been submitted as part of previous permit renewal applications.

Before construction of the 10-acre Impoundment, a French drain groundwater collection system was constructed around the perimeter of the 19-acre Impoundment. The 10-acre Impoundment construction left the original French drain along the west side of the 19-acre Impoundment in place, by constructing the liner system above it. Subsequently, in 1986 the French drain system

groundwater collection system was extended around the south, west, and north sides of the 10-acre Impoundment (see Figure 4). The entire French drain system gravity drains to a sump located southeast of the 19-acre Impoundment, from which it is pumped to the wastewater treatment facilities.

Prior to construction of the 10-acre Landfill, the surface elevation of accumulated solids deposited in the 10-acre Impoundment, excepting the drainage sump in the southeast corner, was approximately 41 to 42 feet NGVD based on a survey at that time (September 2000). The perimeter elevations surrounding the 10-acre Impoundment were raised on several occasions since its original construction, to +44.75 feet NGVD. Increasing the elevations around the 10-acre Impoundment were accomplished by raising dike heights in conjunction with reinforced concrete block wall sections in selected locations. During each dike raising construction project, the synthetic pond liner system was extended up the inboard slope. Selected engineering drawings (Thompson Engineering) displaying dike raising construction details was submitted previously as part of permit renewal application.

The design concept for development, operation, and eventual final closure of the 10-acre Landfill employed similar methods used for closure of the adjacent former 19-acre Impoundment. There were three principal phases:

- Phase I - Initial site dewatering and stabilization
- Phase II - Landfill placement of dry iron oxide solids to conform to final grade contours
- Phase III - Final grading and construction of final cap and vegetative cover

Design engineering details for the 10-acre Landfill are discussed in following sections and presented in drawings that were included in previous permit renewal application submittals. Landfill operations are also addressed in following text sections and were submitted in previous permit applications. Closure and post-closure plan information is described in following text sections of this submittal and depicted in engineering drawings submitted in previous permit applications. When the current status of the landfill changes, the operations and closure/post closure plans will need to be modified to suit the site conditions.

The Phase I construction (initial site dewatering and stabilization) was completed in December 2002. During the Phase I construction, general site grading and shaping was accomplished utilizing mechanized equipment. The initial lifts using select granular fill material and geogrid were installed to provide adequate stabilization of the existing materials. The integral strip drains were placed from north to south and west and east. These drains were placed in a continuous / inter-connected manner to allow seepage / flow of the liquids contained within the landfill area to the southeast sump.

The Phase I construction sequences was initiated at the north embankment of the 10-acre Impoundment and installation of the select fill / geogrid and strip drains progressed in a systematic pattern that compressed and dewatered the existing materials. Installation of additional layer(s) of select fill and geogrid were not required. On top of the select granular fill, select structural fill base course (compacted clay) was constructed as a stabilization layer for traffic (trucks and equipment).

Drainage improvements during the Phase I construction phase included perimeter ditches and drain piping (connected to strip drains) that were installed to allow gravity flow of surface waters and seepage during dewatering from the construction area to a sump located at the southeast impoundment area. All liquids were pumped back to the process, to the 27-acre Impoundment, the 2-acre Impoundment, and/or wastewater treatment.

Following fill placement in Phase II, Phase III final grading, cap construction, vegetative cover, and related closure activities will be completed.

It should be noted that the 10-acre Landfill does not currently accept waste. However, it is requested that waste materials from the site that are contaminated with residual iron oxide be disposed within the 10-acre Landfill. This should be noted in the new permit. It is proposed that the maximum average daily volume to be received at the landfill remain at 1,100 cubic yards per day as is currently permitted.

2.0 SITING STANDARDS (335-13-4-.01)

2.1 Floodplain

Flood hazard areas for the Multistate Trust facility are depicted on Panel 667, Map Number 01097C0667J (effective date July 6, 1998) of the Flood Insurance Rate Map for Mobile County, Alabama, and Incorporated Areas. The 10-acre Industrial Landfill is not located within a flood hazard area, being designated as Zone X, Areas Determined to be outside 500-year Floodplain.

2.2 Endangered or Threatened Species

The area which is subject to this permit renewal application has been previously permitted, constructed, and used as an industrial landfill. Therefore, no potential impact on endangered or threatened species will occur by continuing operation of this landfill. Since the area has already been constructed, and has been previously permitted under the ADEM Solid Waste program, coordination and consultation with the Wildlife Service is not required.

2.3 NPDES Permit

The Multistate Trust Mobile, Mobile County, Alabama facility has an individual permit issued by ADEM designated as Permit Number AL0026328. The latest permit expires September 30, 2023. This permit allows three discharges, one which includes treated process wastewater and storm water from process areas (DSN 001), and two which include storm water from other plant areas (DSN 002, DSN 003). All seepage water from dewatering/stabilization of the landfill area and all storm water from operation of the landfill area, will be routed to waste treatment facilities which eventually discharge through DSN 001.

2.4 Wetlands

The area which is subject to this permit renewal application has been previously permitted, constructed, and used as an industrial landfill. Therefore, no potential impact on wetlands will occur by continuing operation of this landfill. Since this area has already been constructed and permitted under the ADEM Solid Waste program, coordination and consultation with the U.S. Army Corps of Engineers is not required.

2.5 Airport Runways

The nearest airport runway or landing strip is located at the Mobile Airport Authority downtown airport (Brookley Field) which is approximately 6.4 miles northeast of the industrial landfill. Putrescible wastes, which attract birds, will not be disposed at the landfill. Therefore, operations at the landfill will not interfere with aircraft operations.

2.6 Zones of Active Faults, Sinkholes, or Karst Terrain

The facility is not located in zones of active faults, seismic impact zones, unstable areas, sinkholes, or Karst terrain. See Section 4.0 of this submittal for more detailed information on site geology and hydrology.

2.7 Archeological or Historical Significance

The area which is subject to this permit renewal application has been previously permitted, constructed, and used as an industrial landfill. Therefore, no potential impact will occur by continuing operation of this landfill. Since the area has already been constructed and permitted under the ADEM Solid Waste program, coordination and consultation with the Alabama Historical Commission is not required.

3.0 PLANS REQUIRED (335-13-4-.12)

3.1 Land Use and Zoning Within 5,280 feet

The industrial landfill is located within the incorporated area of the City of Mobile, Mobile County and is zoned as Industrial. The area has been dedicated to industrial land use since the 1960's. The industrial landfill is situated totally within the Multistate Trust facility boundaries, which is located within the Theodore Industrial Park area. Land use within 5,280 feet (i.e., one mile) of the industrial landfill is almost exclusively industrial. Some commercial and limited residential usage is present along Hamilton Boulevard (Island Road) which bounds the Theodore Industrial Park area on the north. Hamilton Boulevard at its closest location is more than 3,000 feet from the industrial landfill site.

3.2 Locations of All Airports within 10,000 feet

There are no airports within 10,000 feet of the industrial landfill.

3.3 On-site Control Points

On-site control points (benchmarks) have been previously established east of the industrial landfill, both north and south of the former 19-acre Impoundment. These are shown on Figure 4.

3.4 Detail Presentation of Geological Units

See Section 4.0 of this renewal application submittal.

3.5 Boundary Plat and Legal Property Description

See Attachment II of this renewal application submittal.

3.6 Initial and Final Topographics

Engineering drawings were submitted in previous permit applications.

3.7 Existing and Proposed Surface Drainage

Existing drainage from the industrial landfill area is routed back to the adjacent 2-acre or 27-acre Impoundments, and/or wastewater treatment facilities which eventually discharge to DSN 001. During Phase I dewatering/stabilization and during Phase II landfill operations, drainage from the landfill area will continue to be routed back to the adjacent 2-acre or 27-acre Impoundments, and/or wastewater treatment facilities and eventually discharge through DSN 001. After Phase III, final capping and closure, storm water drainage from the closed landfill

area will be directed to existing facility storm water conveyances which discharge to DSN 002. See Figure 3.

3.8 Buffer Zones

The industrial landfill site lies totally within the Multistate Trust Mobile, Mobile County, Alabama facility boundaries. The surrounding Multistate Trust property provides a buffer zone well in excess of the required 100 feet. At its closest location (to the north), the Multistate Trust facility boundary is about 430 feet from the industrial landfill boundary.

3.9 Detail Plans for Temporary and Permanent Access Roads

The industrial landfill area is accessed totally from within the Multistate Trust facility boundaries by existing improved roads maintained by the facility. See Figure 3.

3.10 Summary of Siting Standards

See Section 2.0 of this renewal application submittal. The industrial landfill area appears satisfactory with respect to all siting standards criteria, and the siting criteria impose no special considerations or constraints to facility design.

3.11 Discussion of Daily Operation

At present, waste disposal to the 10-acre landfill is suspended. At some point in the future, the landfill will be used for disposal of residual iron oxide solids and iron oxide contaminated materials from the site. Mechanical equipment (e.g. dozer) at the fill site will be utilized to contain, shape, and grade the deposited fill. In general, the fill will be progressively mounded from the center outward to direct run-off to perimeter drainage. Information submitted to ADEM in previous applications indicates there is sufficient headspace at the landfill to accommodate this activity.

Currently, storm water from within the 10-acre Landfill is directed to perimeter ditches which drain to the 27-acre Impoundment (an NPDES-regulated surface impoundment). Drainage from the 27-acre Impoundment is pumped back to wastewater treatment facilities (eventually discharging to DSN 001). Alternately, the 10-acre landfill storm water is diverted to the 2-acre Surge Impoundment and wastewater treatment.

3.12 Operation Procedures for Unloading, Compacting, and Covering

Final material to be placed in the landfill will be deposited as discussed above. The materials to be deposited require no additional compacting measures other than achieved by dozer distribution and grading in the landfill. The

characteristics of the materials, as well as storm water control features as previously described, negate the need for interim cover during landfill operations.

3.13 Presentation of Special Engineering Features

Refer to prior discussions and engineering drawings that were submitted with previous permit applications.

3.14 Relevant Point of Compliance

See Section 9.0 of this renewal application submittal.

3.15 Quality Assurance / Quality Control Plan (QA/QC) for any Liner, Leachate Collection, or Cap System

The industrial landfill was constructed above dewatered/stabilized impoundment deposits in the 10-acre Impoundment, which was regulated as an NPDES surface impoundment. As previously described, construction of the 10-acre Impoundment included a bottom liner system comprised by a 30-mil Hypalon synthetic liner, with an underlying 6-inch sand layer and underdrain system, below which a 2-foot compacted clay layer was constructed. Available documentation of design and construction of this bottom liner system was included in previous permit applications.

The final cap system to be constructed during Phase III (closure), including installation standards and QA/QC provisions, is described in later sections of this renewal application submittal and shown on engineering drawings submitted in previous permit applications.

3.16 Groundwater Monitoring Plan

See Section 9.0 of this renewal application submittal.

3.17 Explosive Gas Monitoring Plan

The iron oxide waste materials that are deposited at the industrial landfill are not an organic waste, and do not generate explosive gases such as methane. Therefore, an explosive gas monitoring plan is not considered applicable.

4.0 SITE GEOLOGY AND HYDROLOGY (335-13-4-.11 and .13)

The former Tronox LLC (formerly Kerr McGee Chemical LLC) and Thompson Engineering have performed numerous hydrogeologic and geotechnical investigations in the vicinity of the subject industrial landfill site. The Multistate Trust submits annual and semi-annual groundwater monitoring reports as a requirement of their NPDES Permit (#AL0026328). Groundwater reports have been performed and submitted for years 1993 through 2018, and include information that depicts geological and hydrogeological characteristics of the iron oxide impoundment area in which the 10-acre Landfill is located. For the most comprehensive description of hydrogeological information related to the facility, refer to Thompson Engineering's report dated May 1991 and entitled "Groundwater Contamination Assessment, Kerr McGee Chemical Corp., Theodore Industrial Park, Mobile, Alabama". That report was prepared as an assessment of groundwater conditions at the adjacent 19-acre iron oxide impoundment, but includes a compilation of information pertinent to the 10-acre Impoundment (industrial landfill area) as well as the 27-acre Impoundment to its west.

4.1 Hydrogeology Standards - Elevation of Groundwater Table

In accordance with general hydrogeology design standards (335-13-4-.11) for landfills, the bottom elevation of the landfill must have a minimum of five feet separation from the highest "seasonal" groundwater table elevation. Groundwater elevations in the vicinity of the industrial landfill have been measured in adjacent monitor well/piezometers on a quarterly basis for over twenty years. These are presented as piezometric contour maps in the referenced groundwater monitoring reports submitted to ADEM. Seasonal high groundwater elevations in the vicinity of the industrial landfill during periods of heavy rainfall have been documented to be near ground surface (nominal elevation +20 feet NGVD).

The bottom elevation for the industrial landfill is approximately +45 ft. NGVD, which indicates a minimum separation of about 25 feet above seasonal high groundwater which is estimated at approximately 20 feet of elevation.

4.2 Site Background Hydrogeological Evaluation by ADEM

As noted, numerous hydrogeological investigations and groundwater monitoring/assessment activities have been performed for the iron oxide impoundment areas. In relation to NPDES regulation of these surface impoundments, ADEM's Groundwater Branch has continually been involved in review and evaluation of monitoring/assessment plans and reports of results. This historical information provides a comprehensive background hydrogeological evaluation of the site.

4.3 Geological Site Characterization Summary

Regional geologic characteristics for the area within a 1-mile radius of the industrial landfill site are depicted on Figure 5, which has been extracted from "Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama; Area 13", prepared by the U.S. Geological Survey (1988) and "Selected Wells and Springs in Southwestern Alabama", prepared by the Geological Survey of Alabama (1987). This reference documents that geologic features such as faults, seismic zones, and sinkholes or karst terrain are not present in the vicinity of the industrial landfill.

Site-specific characterization of subsurface conditions in the iron oxide impoundments area has been accomplished by numerous geotechnical and hydrogeological investigations over many years. A comprehensive compilation and discussion of historical soil borings (locations and geologic logs) in the vicinity is presented in the referenced Thompson Engineering 1991 report.

The subsurface at the facility consists of clay, sandy clay, and clayey sand lenses to approximately 20 feet below ground surface. These are unconsolidated sediments, alluvial deposits of Holocene age. Underlying the Holocene formation to around 60 feet below ground surface is a clayey stratum of Pliocene-Pleistocene age. This unit is considered to be semi-confining in the local region and is referenced hydrogeologically as an aquitard. This unit is followed by the Upper Miocene formation at a depth of approximately 60 to 110 feet below the ground surface. This unit consists of silty sands that grade coarser with depth. At approximately 110 feet below the ground surface is the middle-Miocene Mobile Clay that consists of a firm to stiff, silty clay. These site stratigraphic/geologic characteristics are displayed in the cross section presented as Figure 6.

Major aquifers in the region include an upper Alluvial-Coastal aquifer and a lower Pliocene-Miocene aquifer. Groundwater use of the Alluvial-Coastal aquifer is limited and rarely used by the water well industry. The Pliocene-Miocene aquifer is more commonly used as a water source and can produce yields from 0.5 to over 2.0 Mgal/day.

Water wells located in the vicinity of the 10-acre Landfill, based on historic records, are presented on Figure 1. Five of the six wells shown are presently or have in the past been used for industrial production. The only private potable use well (north of Hamilton Boulevard/Island Road) has been abandoned. No public or private potable use wells are known to be active. Potable water from the Mobile Area Water and Sewer System is available along Rangeline Road and Hamilton Boulevard. Additional well and potable water information is presented in the referenced Thompson Engineering 1991 report.

4.4 Piezometers and Monitor Wells

Piezometers and monitor wells have been previously constructed in the vicinity of the industrial landfill, and have allowed evaluation of groundwater elevations in the vicinity of the iron oxide impoundments. No additional piezometers were constructed for this evaluation. There are approximately 62 monitor wells and/or piezometers in the vicinity of the iron oxide impoundments. Nine (9) of these are “deep” monitor wells screened within the silty to coarse sands of the lower Pliocene/Miocene aquifer. The remaining piezometer/monitor wells are screened in the silty sands of the uppermost Alluvial-Coastal aquifer. In 2018, ten (10) piezometers/monitor wells were either replaced or added to the site in the vicinity of the landfill and nine (9) were completely abandoned. Figure 7 provides the location of piezometer/monitor wells and Table 1 gives pertinent information on their construction (updated January 2019). Monitor wells and piezometer construction logs have been presented in prior reports as previously referenced. New monitoring wells and piezometer construction logs can be found in “Monitoring Well/Piezometer Abandonment and Installation Report” (Thompson Engineering) which is anticipated to be submitted to ADEM in February 2019.

4.5 First Zone of Saturation

The unconsolidated, alluvial deposits comprise the uppermost groundwater aquifer, referred to as the Alluvial-Coastal aquifer. The groundwater surface is typically 4 to 8 feet below ground surface, but may be near ground surface during extended periods of heavy rainfall. Recharge to the aquifer is by direct infiltration. The aquifer is typically 12 to 16 feet in saturated thickness.

4.6 Underlying Aquifers

The second zone of saturation is the Pliocene-Miocene aquifer, within the silty to coarse sands, which lie above the mid-Miocene “Mobile Clay” formation. The Alluvial-Coastal and Pliocene-Miocene aquifers, in the localized iron oxide impoundment area, do not appear interconnected due to the presence of the Pliocene-Pleistocene aquitard.

4.7 Piezometer Measuring Point Elevation

The top-of-casing for all monitor wells and piezometers have been surveyed using Monument #3, located south of the former 19-acre Impoundment area as a control monument.

4.8 Groundwater Elevations

The Alluvial-Coastal aquifer elevations fluctuate with the frequency and duration of rainfall in the area. Groundwater is typically 4 to 8 feet below the ground surface, but may exist near ground surface during extended periods of heavy

rainfall. Groundwater elevations of the uppermost aquifer may be locally depressed due to a French drain groundwater collection system located around the perimeter of the industrial 10-acre landfill and former 19-acre Impoundment. Groundwater elevations in the vicinity of the industrial 10-acre landfill may typically vary from approximately +20 feet (near ground surface) to +12 feet NGVD.

The Pliocene-Miocene aquifer is approximately 60 to 110 feet below the ground surface. Piezometric elevations in the area are typically between +10 to +14 feet NGVD.

4.9 Groundwater Flow Direction and Rate

The overall groundwater flow direction of the Alluvial-Coastal aquifer is generally eastward. However, in the vicinity of the French drain, groundwater flow direction may be locally altered to flow towards the drain system. The Pliocene-Miocene aquifer flows east-northeast in the vicinity of the industrial landfill. Figures presenting quarterly groundwater contour maps for the Alluvial-Coastal and Pliocene-Miocene aquifers are provided in the 2017 annual monitoring report and 2018 Semi-annual Report.

Based on gradients towards the French drain system, average groundwater velocity of the Alluvial-Coastal aquifer is approximately 8.2×10^{-6} cm/sec (0.023 ft/day) for the Alluvial-coastal aquifer. The average groundwater velocity for the Pliocene-Miocene aquifer was calculated to be approximately 7.5×10^{-7} cm/sec (0.002 ft/day) for the Pliocene-Miocene aquifer (reference 2017 annual report).

4.10 Resumes and References

Resumes of Thompson Engineering individuals experienced with prior hydrogeological investigations at the facility are provided in Attachment VI to this renewal submittal.

4.11 Review of Report by ADEM

As noted previously, ADEM's Groundwater Branch has reviewed plans and reports for the numerous hydrogeological investigations and monitoring/assessment programs conducted in relation to NPDES regulation of the iron oxide surface impoundments.

5.0 GROUNDWATER RESOURCES (335-13-4-.14)

5.1 Depth to Groundwater and Flow Direction

Reference is made to prior discussions in Section 4.0 of this renewal submittal.

5.2 Permeability of On-Site Soils

Soils in the vicinity of the 10-acre Landfill have been previously evaluated using slug tests and laboratory tests. Slug test data from monitor wells MW-38, MW-42, and MW-47 have indicated a horizontal conductivity of approximately 10^{-4} cm/sec for the Alluvial-Coastal aquifer. Vertical conductivity analyses of soils in this stratum were performed in the laboratory and indicated values of around 10^{-5} cm/sec. Laboratory tests performed for vertical conductivity on samples collected from the Pliocene-Pleistocene aquitard averaged approximately 10^{-8} cm/sec. Slug tests have also been performed on monitor wells MW-34, MW-35, and MW-36 (abandoned in 2018) to determine horizontal conductivity in the Pliocene-Miocene aquifer. These field tests indicated average values of approximately 10^{-2} cm/sec. Detailed analysis is provided in the referenced Thompson Engineering 1991 groundwater assessment report.

5.3 Monitoring of the Groundwater in the First Zone of Saturation

Groundwater monitoring at the iron oxide impoundment facility consists of 51 wells sampled quarterly under the NPDES monitoring programs. Of those, 42 monitor wells are constructed in the Alluvial-Coastal aquifer (first zone of saturation). Monitor wells in the Alluvial-Coastal aquifer immediately adjacent to the industrial landfill are S3A and S4A (located to the south) and N6, N7, and W1R (located to the north). For detailed information on the present monitoring program, refer to the facilities' Groundwater Monitoring Report submittals (1993 through 2018).

5.4 Upgradient and Downgradient Monitor Wells

Groundwater flow in the Alluvial-Coastal aquifer is generally towards the east, except in the vicinity of the French drain system. The nine monitor wells established in the Alluvial-Coastal aquifer for the 27-acre Impoundment (MW-60 through 65 and MW-67 through 69) are located upgradient of the 10-acre Landfill. Four monitor wells (N6, N7, NW, and W1R) to the north of the 10-acre landfill may be considered "cross-gradient". Two monitor wells (S3A and S4A) are "cross-gradient" to the south. The remaining monitor wells and piezometers are located downgradient of the industrial landfill, but they are more subject to influence from the 19-acre Impoundment area. See Section 9.0 for description of the monitoring program applicable to this landfill permit renewal application submittal.

5.5 Location of Wells Approved by ADEM

The location and design of the current monitor wells and piezometers have been approved by ADEM in connection with the NPDES regulated monitoring program. It should be noted that a survey of all the monitoring wells currently in use is scheduled for 2019.

5.6 Background Water Quality Established

Background water quality has been established under the facility's NPDES permit monitoring requirements.

5.7 Monitor Well Construction

Monitor well construction procedures have met related ADEM requirements, and have been submitted to and approved by ADEM's Groundwater Branch in connection with the NPDES related monitoring and assessment program.

5.8 Groundwater and Analysis Plan

See Section 9.0 of this landfill renewal application submittal.

6.0 OTHER DESIGN STANDARDS (335-13-4-.15, .16, .17, .18, and .19)

6.1 Cover (335-13-4-.15)

Since storm water runoff from the landfill area will be completely contained and routed to storage/treatment systems regulated under NPDES (see Section 3.0), interim cover during landfill operations is not required.

Final cover will include a cap comprised of a flexible membrane liner (40-mil HDPE), a minimum 18-inch infiltration layer of compacted select clay, and a minimum 6-inch erosion layer (topsoil) which will be vegetated. See Section 7.0 and engineering drawings presented in Attachment IV to this application submittal. Suitable materials for the final cover are commercially available. Any proposal to use alternate cover systems shall be submitted to and approved by ADEM.

6.2 Explosive Gases (335-13-4-.16)

Due to the nature of the iron oxide solids to be placed in the landfill, explosive gas monitoring is not required. See Section 3.17.

6.3 Drainage (335-13-4-.17)

No storm water run-on from areas outside of the landfill perimeter will occur, since the area is elevated above the grade of surrounding areas.

Storm water run-off from within the landfill operations area will be completely contained and diverted to NPDES-regulated storage/treatment systems. Run-off control structures which will be constructed to divert storm water to the adjacent 27-acre Impoundment have been designed to collect and control the water volume resulting from at least a 24-hour, 25-year storm.

6.4 Liners (335-13-4-.18)

The former 10-acre Impoundment, above which the 10-acre Landfill is operated, was constructed with a bottom liner system as has been previously described in Section 1.0 of this renewal application submittal.

6.5 Access (335-13-4-.19)

The 10-acre Landfill is located within the existing Multistate Trust facility boundaries, and access to the landfill area is restricted to on-site interior roads maintained by the Multistate Trust. The facility is completely secured by fencing and/or natural barriers surrounding its property. The only access to the Multistate Trust facility is its entrance from Rangeline Road (Hwy 193).

7.0 CLOSURE AND POST-CLOSURE PLAN (335-13-4-.20)

7.1 Written Closure and Post-closure Plan

This section of the renewal application submittal, along with the engineering drawings submitted with previous permit renewal applications, constitutes the written closure plan and post-closure plan required by 335-13-4-.20.

7.2 General

Following completion of Phase II Landfill Operations, the Multistate Trust will initiate final cover construction (Phase III), as described in the following subsections.

Since the landfill is to be operated as a single cell, the largest area of the landfill requiring final cover is represented by the total landfill disposal area, approximately 10 acres.

The maximum inventory of wastes to be placed in the landfill over its active life was originally estimated to be about 320,000 cubic yards (475,000 tons).

The schedule for implementing and completing closure of the landfill is presented in following subsections.

7.3 Final Cover

The final cover (cap) proposed for the 10-acre Landfill is comprised of a 40-mil HDPE synthetic liner installed above the deposited and graded iron oxide solids, above which a select clay fill (minimum 18-inch) infiltration layer will be constructed, above which a minimum 6-inch topsoil erosion layer will be placed. Any proposal to use alternate cover systems will be submitted to and approved by ADEM.

Installation of the 40-mil HDPE flexible membrane liner cap shall follow manufacturer's recommendations. A quality assurance/quality control (QA/QC) plan for inspection and testing of liner installation will be developed by a Professional Engineer. Prior to implementing closure, recommended manufacturer's installation specifications and the installation QA/QC Plan will be submitted to ADEM for approval. The installation of the liner shall be under the oversight of a Registered Professional Engineer who shall certify that the liner was installed in accordance with the approved design, specifications, and QA/QC plan.

Construction of the minimum 18-inch select clay layer shall be conducted to achieve an effective infiltration layer. The minimum 6-inch erosion layer shall be

a “topsoil” capable of sustaining native plant growth. Construction specifications for the infiltration layer and erosion layer will include:

“Select Clay” material shall be an onsite or offsite lean clay material with a USCS classification of CL, containing a minimum of 95 percent passing the No. 4 sieve, with a minimum Plasticity Index of 10, and a maximum permeability of 1.0×10^{-5} cm/sec. Fill placement should proceed in maximum loose lift thickness of 6 to 8 inches with each lift compacted to 95 percent of soils’ laboratory determined Standard Proctor Density as per ASTM D-698 within a moisture content range of optimum moisture to 3 percent above optimum moisture.

“Topsoil” material, meeting ASTM D-5268, shall be placed in maximum loose lift thickness of 6 to 8 inches and proof rolled to the satisfaction of the construction QA/QC soils technician working under the direction of the Geotechnical Engineer of Record.

The construction of the select clay fill infiltration layer and topsoil erosion layer will be subject to inspection and testing specified in a Construction QA/QC Plan. A Professional Engineer shall oversee the construction and certify that it was performed in accordance with the approved design, specifications, and QA/QC Plan.

7.4 Grade (5% to 25%)

Final grades are between 5 and 25 percent.

7.5 Horizontal Terraces

Horizontal terraces, of sufficient width for equipment operation, will be provided for every 20-foot vertical rise in elevation.

7.6 Final Grading Within 90 Days

Final grading of the infiltration layer shall be completed within 90 days after the landfill has received the last known receipt of waste.

7.7 Vegetative Cover Within 90 days after Final Grading

Within 90 days after completion of final grading requirements, the final cover (topsoil erosion layer) shall be prepared for the establishment of a vegetative cover. Deep rooted vegetation (roots that may grow below the 6 inch erosion layer) shall be prohibited as vegetative cover. Preparation of a vegetative cover shall include, but not be limited to, the following:

1. Placement of appropriate species of grass seed, fertilizer and mulch; and

2. Watering and maintenance necessary such that germination of grass will occur.

7.8 Start of Closure

Closure activities will be initiated no later than 30 days after the date of which the landfill receives the known final receipt of wastes or as mandated by ADEM. It is requested that landfill closure be extended until this renewal permit expires under the provisions of 335-13-4-.20 Closure and Post Closure, paragraph (2)(f).

7.9 Completion of Closure

The Multistate Trust will complete closure activities of the landfill in accordance with this closure plan within 180 days following the last known receipt of waste. In the event that closure cannot be completed within this time frame, Multistate Trust will submit a request to ADEM for extension of the 180 day period. Any request for extension of time shall not exceed an additional 180 days, and must demonstrate that closure will, of necessity, take longer than 180 days and that all steps necessary to prevent threats to human health and the environment from the unclosed landfill will continue to be performed.

7.10 Closure Certification

Within 90 days after final closure requirements are achieved, the Multistate Trust will submit to ADEM a certification statement, signed by a Registered Professional Engineer, verifying that closure has been completed in accordance with the closure plan. A copy of the certification will be placed in the operating record located at the facility.

7.11 Post-closure Maintenance

Following closure of the landfill site, the Multistate Trust will conduct post-closure maintenance. The maintenance activities will include periodic inspection and include the following:

- eroded areas will be filled with suitable soil cover, compacted, and graded with appropriate cover.
- areas which provide ponding of surface water will be filled, graded, and an appropriate cover established.
- landfilled areas with extensive surface cracks in soil cover will be corrected as necessary to prevent infiltration of surface water.
- an appropriate cover shall be maintained on the facility at all times.

- internal notifications to the Multistate Trust operating elements will be issued indicating that the landfill is now closed, and alternative locations of where to dispose of the solid waste material will be determined. The notification will also include the name and telephone extension of the contact person at Multistate Trust so employees know who to contact with questions. Since wastes being deposited at the landfill are strictly controlled internal to the Multistate Trust operations, posting of signs at the landfill area is not considered necessary.
- monitor wells, drainage control structures, and erosion control features shall be maintained by the Multistate Trust throughout the active life and post-closure care period.
- any deficiencies identified by ADEM during site inspections will be corrected.

7.12 Length of Post-closure Care

Post-closure care of the landfill will be performed for a period of 30 years as per ADEM Rule 335-13-4-.2 (3)(a) or for a decreased time period if the Multistate Trust demonstrates to ADEM that the reduced time period is sufficient to protect human health and the environment, and such demonstration is approved by ADEM.

7.13 Placement of Closure in Operating Record

A copy of this written closure and post-closure plan, when approved by ADEM, will be placed in the operating record.

7.14 Post-Closure Use of the Property

The Multistate Trust does not plan to utilize the closed landfill area for any specific purpose at this time. Post-closure use of the property will not be allowed to disturb the integrity of the final cover, liner, or any other component of the containment system, or the function of the monitoring systems necessary to comply with the requirements of applicable regulations. ADEM may approve any other disturbance if the Multistate Trust demonstrates that the disturbance, including any removal of waste, complies with the following:

1. The activities will not increase the potential threat to human health or the environment; or
2. The activities are necessary to reduce a threat to human health or the environment.

7.15 Post-Closure Certification

The Multistate Trust will submit to ADEM a certification statement, signed by a Registered Professional Engineer, verifying that post closure care has been completed in accordance with the post-closure plan. A copy of the certification will be placed in the operating record located at the facility.

7.16 Record Notation on Land Deed

Within 90 days after permit expiration, revocation or when final closure requirements are achieved as determined by ADEM, the Multistate Trust shall record a notation onto the land deed containing the property utilized for disposal, and/or some other legal instrument that is normally examined during a title search, that will in perpetuity, notify any potential purchaser of the property that:

1. The land has been used as a solid waste disposal facility landfill unit;
2. Its use is restricted by the items contained in 335-13-4-.20(3)(c) and 335-13-4-.20(3)(d) of ADEM solid waste regulations;
3. The locations and dimensions of the landfill unit with respect to permanently surveyed benchmarks and section corners shall be on a plat prepared and sealed by a land surveyor;
4. Contain a note, prominently displayed, which states the name of the Permittee or operating agency, the type of landfill unit and the beginning and closure dates of the disposal activity;
5. Certification by an Engineer or Land Surveyor that all closure requirements have been completed as determined necessary by ADEM.

7.17 Final Contour and Grading Plan

Final grade contours after closure of the landfill are depicted on the engineering drawings submitted in previous permit renewal applications.

8.0 OPERATIONAL STANDARDS (335-13-4-.21, .23, and .26)

8.1 Standard Operating Procedure

The Standard Operating Procedure (SOP) for operation of the 10-acre Landfill is included for reference purposes as Attachment V to this renewal application submittal. The SOP for the 10-acre Landfill will be updated and modified by the Multistate Trust if and when changes to operational techniques or procedures become needed. However, no changes to the SOP will be made which conflict with this submittal or applicable regulations unless approved by ADEM.

8.2 General Operational Standards (335-13-4-.21)

8.2.1 Open Burning

The solid waste material placed in the landfill is inorganic and not subject to burning. Open burning of any wastes is strictly prohibited unless prior approval is received from ADEM.

8.2.2 Acceptable Wastes

Acceptable wastes permitted for the disposal in the landfill consists only of the residual iron oxide solids and waste materials contaminated with iron oxide residue which have been previously described in Section 1.0 of this renewal application submittal.

Other solid waste streams may only be disposed at the landfill upon subsequent approval by ADEM.

8.2.3 Hazardous and Infectious Wastes Plan

Multistate Trust personnel responsible for landfill operations will ensure that free liquids, regulated hazardous wastes, medical wastes, and regulated PCB wastes are not placed in the landfill.

8.2.4 Industrial Users

There are no users of the landfill other than the Multistate Trust. All solid waste materials are generated on-site and remain on-site.

8.2.5 Out-of-State Waste

No out-of-state wastes shall be disposed of at the landfill.

8.2.6 Water Pollution (Discharge)

Drainage from the landfill, as previously described, is contained and controlled through the facility's NPDES-permitted discharges.

8.2.7 NPDES Permit

The facility has an individual NPDES permit issued by ADEM (AL0026328) which is applicable to the storm water drainage from the landfill site, as has been previously described.

8.2.8 Groundwater Contamination

See Section 9.0 of this renewal application submittal.

8.2.9 Industrial Waste Certification

The material disposed of at the landfill does not contain free liquids, medical wastes, regulated hazardous wastes, or regulated PCB wastes. Copies of analytical data pertaining to this part of the certification will be maintained on-file in the operating record of the facility. See Attachment I to this renewal application submittal.

8.2.10 Permanent Markers

Permanent markers are not needed for the landfill since operational areas are completely within and controlled by the Multistate Trust facility, and since no off-site wastes are permitted.

8.2.11 Measuring and Weighing Devices

Measuring or weighing devices are not required since all solid waste is generated by the permittee on-site. Daily truck counts will be maintained to determine the volume of iron oxide solids taken to the landfill.

8.3 Specific Requirements for Industrial Landfills (335-13-4-.23)

8.3.1 Cover

Weekly cover will not be performed since the storm water run-off is completely controlled, and due to the inert nature of the solid waste material. The inert nature of the waste material does not pose a concern for disease vectors, fires, odors, blown litter, or scavenging.

8.3.2 Closure

Final closure will be carried out in accordance with 335-13-4-.20 (see Section 7.0 of this permit application).

8.3.3 Grading

See Sections 3.11 and 3.12 of this renewal application submittal.

8.3.4 Final Grading

See Section 7.0 of this renewal application submittal.

8.3.5 Establishment of Vegetative Cover and Maintenance

Refer to Section 7.0 of this renewal application submittal.

8.3.6 Unloading and Compacting Waste

See Section 3.12 of this renewal application submittal.

8.3.7 Confine Waste Area

Additional placement of iron oxide contaminated materials derived from the site is proposed. The placement of approved materials will be confined to as small an area as possible.

8.3.8 Operating Slope

Operating slopes shall not exceed 25% (4h to 1v).

8.3.9 Scavenging

Scavenging shall not be permitted at the landfill.

8.3.10 Salvaging

Salvage operations will not be conducted at the landfill.

8.3.11 Litter Control

The landfill area will be policed regularly to insure litter from haul trucks or operators are not present.

8.3.12 Fire Control

Fire control measures are not needed since the waste material is inorganic.

8.3.13 Site Access Control

See Section 6.5 regarding access, security, and barriers.

8.3.14 Sign

A sign is not required since the facility does not accept waste from the public or commercial haulers.

8.3.15 All Weather Access Road to Working Face

Access roads, which are completely within the Multistate Trust facility boundaries, are improved and maintained.

8.3.16 Adverse Weather

Disposal operations will be suspended during adverse weather.

8.3.17 Adequate Personnel

The Multistate Trust will provide adequate personnel and a designated landfill supervisor trained in landfill techniques to ensure continued and smooth operation of the landfill.

8.3.18 Personnel Facilities

The Multistate Trust facility has several buildings with restrooms, break rooms, and telephones for personnel to use.

8.3.19 Adequate Equipment

Adequate equipment is maintained at the facility for operation and maintenance of the landfill through a contractor, including haul trucks, bulldozers, and similar equipment.

8.3.20 Monitoring and Treatment Structures

Environmental monitoring and treatment structures will be protected and maintained in good repair.

8.3.21 Records – Daily Volume, Quarterly Reports

At present waste disposal to the landfill is suspended. As discussed previously and approved by ADEM, when the landfill is again used as a landfill, records of daily volume of waste placed in the landfill will be maintained by the Multistate Trust and submitted to Alabama Department of Revenue (ADOR) as required.

8.3.22 Vector Control

Since putrescible wastes are not disposed of in the landfill areas, vector control problems are not anticipated. The operational standards and placement of waste material in the landfill will be conducted so that run-off from the landfill is not impeded. Therefore, there should be no concern for the breeding of mosquitos.

8.3.23 Liquid Waste

The iron oxide solids to be placed in the landfill do not have free liquids. Containers capable of holding liquids will not be placed in the landfill.

8.4 Special Waste (335-13-4-.26)

8.4.1 Non-hazardous Certification

See waste characterization documentation including TCLP analyses in Attachment I to the renewal application submittal. Additional periodic TCLP analyses and certification for the iron oxide solids will be submitted to ADEM at the frequency required.

8.4.2 Asbestos, Foundry Sand, Petroleum Contaminated Soil, Municipal Solid Waste Ash, and Infectious Waste

The facility does not generate, nor will the landfill accept, asbestos, foundry sand, petroleum contaminated soil, municipal solid waste ash, or infectious waste.

9.0 GROUNDWATER MONITORING AND CORRECTIVE ACTION (335-13-4-.27)

9.1 Applicability

A groundwater monitoring program is applicable to industrial landfill (ILF) units when determined necessary by ADEM to protect public health and the environment. ADEM may adopt any part of landfill regulations pertaining to groundwater monitoring and corrective action (335-13-4-.27), but not necessarily all provisions relating to municipal solid waste landfill (MSWLF) units, as applicable to ILF units. A groundwater monitoring program is required for landfill units prior to placement of waste in the unit.

As noted previously, the facility is currently performing groundwater monitoring in fulfillment of their NPDES permit requirements, which relate to all surface impoundments in the iron oxide impoundment area, including the 10-acre Impoundment, that was converted to the industrial 10-acre Landfill. The Multistate Trust will continue this monitoring program to satisfy monitoring requirements applicable to the 10-acre Landfill, as well as continuing NPDES requirements related to the adjacent surface impoundments. This will allow coordinated review of all monitoring and corrective actions at the iron oxide impoundment areas, and avoid possibly duplicative efforts for the Permittee and Agency. The current monitoring program includes elements which are believed to appropriately address all related provisions of the landfill regulations considered appropriate for the industrial landfill.

9.2 Length of Monitoring

The groundwater monitoring program shall be conducted throughout the active life and post-closure care period of the landfill.

9.3 Alternative Schedule for Demonstrating Compliance

ADEM may establish alternative schedules for demonstrating compliance with ADEM notification requirements. It is envisioned that current reporting methods used for compliance with the facility's NPDES permit will also continue to apply to the solid waste permit requirements.

9.4 Appropriate Number, Location, and Depth of Wells

The location, number, and depth of existing monitoring wells for the iron oxide impoundments at the facility have been summarized in Sections 4.0 and 5.0 of this submittal. Detailed information on these wells has been presented in referenced reports. The current on-site wells are considered sufficient in number to fulfill groundwater monitoring requirements. Their location and well depths address groundwater monitoring requirements relating to aquifer thickness,

groundwater flow rate, and groundwater flow direction including seasonal and temporal fluctuations in groundwater flow. Using a coordinated monitoring program for the landfill permit and continuing NPDES requirements, assessment of monitoring results can be performed in a holistic manner without possible arbitrary delineations between the landfill boundary and the pre-existing surface impoundments. Nevertheless, certain of the existing wells are most applicable to the industrial 10-acre landfill area. These include the Alluvial-Coastal aquifer monitoring wells which are located outside of the existing perimeter French drain groundwater collection system, specifically S3A and S4A to the south and N6, N7, and W1R to the north. These monitoring wells are well within the requirement [335-13-4-.27 (3)] for the relevant point of compliance to be no more than 150 meters (492 feet) from the waste management unit boundary, and on property owned by the Multistate Trust.

9.5 Monitoring Well Design and Construction

See Section 5.0 of this renewal application submittal, and referenced reports.

9.6 Sampling and Analysis Procedures

The facility is currently performing quarterly groundwater sampling and providing those results to ADEM on a semi-annual basis. In the June 2017 NPDES permit, ADEM requires a Semi-Annual Groundwater Monitoring Report be submitted in the month of September summarizing the sampling results from the first and second quarter sampling events of the year. ADEM also requires an Annual Groundwater Monitoring Report be submitted in the month of April summarizing the quarterly sampling results for the previous calendar year. There are currently 51 monitor wells sampled quarterly for 15 analytical parameters. Sampling and analytical procedures utilize consistent methodologies that have been approved by ADEM in connection with the NPDES regulated monitoring program. Refer to annual groundwater monitoring reports and prior investigations for additional details.

9.7 Background Water Quality

Statistical analyses are required under the NPDES permit monitoring program, and are presented to ADEM annually. In the June 2017 NPDES permit, ADEM requires the statistical evaluation report be included in the Annual Groundwater Monitoring Report that is submitted in the month of April. These statistical analyses compare data from individual monitor wells to selected background wells from both the Alluvial-Coastal aquifer and the Pliocene-Miocene aquifer.

9.8 Statistical Method Used

The facility's NPDES permit requires a statistical evaluation of the data from the monitor wells. The analysis is performed annually to individually compare

selected monitor well results to background wells. Refer to Annual Groundwater Monitoring Reports and the Annual Groundwater Statistical Analysis Reports submitted in 2014 through 2018 for additional details.

9.9 Detection Monitoring Program

Pursuant to landfill regulations for detection monitoring [335-13-4-.27 (a)(2)], ADEM can specify constituents to be included in the detection monitoring program. The facility's current NPDES permit monitoring program includes a list of parameters approved by ADEM. The current list of parameters used in the quarterly monitoring is considered sufficient for the detection monitoring objectives. In addition to groundwater piezometric elevations, the parameters include: pH, temperature, specific conductance, chloride, total dissolved solids, aluminum, beryllium, cadmium, chromium, iron, lead, manganese, nickel, zinc, and turbidity. These parameters are based on constituents and characteristics of the iron oxide materials, which have been placed in existing surface impoundments and will be placed in the industrial landfill. It is noted that previous investigations have included analyses of a wide range of inorganic and organic contaminants, providing further basis for the selection of parameters included in the current program (refer to the Thompson Engineering 1991 report).

9.10 Assessment Monitoring Program

The ongoing monitoring program involves regular and periodic reporting and evaluation of data from all wells surrounding the iron oxide impoundments at the facility, including the 10-acre Impoundment that was converted to an industrial landfill. The existing NPDES permit monitoring program allows for further action to be required by ADEM when indicated by a statistically significant increase over background. If such further action is deemed warranted, and includes more comprehensive "assessment" monitoring requirements, a plan detailing specific investigative procedures (such as parameters, frequency, locations) will be submitted to ADEM for approval.

9.11 Corrective Action Program

As noted above, the existing NPDES monitoring program allows for further action to be required by ADEM, if deemed warranted based on review and evaluation of monitoring data. If possible corrective actions appear warranted, an assessment will be initiated which evaluates the effectiveness of potential remedial measures, including an analysis of: (1) performance, reliability, ease of implementation, and potential impacts of appropriate remedies; (2) time required to begin and complete the remedy; (3) the costs of remedy implementation; and (4) institutional requirements (such as permits). The assessment of potential corrective actions, including a proposed selected alternative, will be submitted to ADEM for concurrence. A schedule for implementation will be established to initiate and complete corrective actions within a reasonable time period. The

implementation schedule will consider factors such as: (1) extent and nature of contamination; (2) practical capabilities of available technologies; (3) capacity for treatment/disposal of wastes generated by the remedy; (4) desirability of utilizing technologies not currently available (but which may offer significant advantages); (5) potential risks to human health and the environment from exposure to contamination prior to completion of the remedy; and (6) resource value of the aquifer. Implementation of remedial actions, when warranted, will include a corrective action groundwater monitoring program, submitted to and approved by ADEM, that meets requirements for assessment monitoring programs previously established, indicates the effectiveness of the corrective action, and demonstrates compliance with groundwater protection standards as applicable.

10.0 RECORDKEEPING (335-13-4-.27)

10.1 Location of Operating Record

The operating record for the industrial landfill will be maintained at the facility.

10.2 Information to be Included in the Operating Record

Information contained in the operating record will include the following:

- Solid Waste Disposal Facility Permit issued by ADEM
- Permit application, operational narrative, engineering drawings, closure and post-closure plan, and other documentation submitted to ADEM during the permitting process
- Inspection records, training procedures, notification procedures and other information related to applicable provisions of 335-13-4-.21(1)(b)
- Any monitoring, testing, or analytical data as required by 335-13-4-.20 concerning closure
- Any demonstration, certification, finding monitoring, testing, or analytical data required by 335-13-4-.27 concerning groundwater monitoring and corrective action.
- Copies of quarterly reports submitted to ADEM that summarize the daily volumes of material placed the landfill, as required by 335-13-4-.23(2)(f)
- Waste certification as required by 335-13-4-.21(1)(c)
- Any other report or document generated in the normal operation of the facility which is submitted to ADEM
- Notice of intent to close the landfill when submitted to ADEM prior to beginning closure, as per 335-13-4-.20(2)(e)
- Professional engineer certification of closure, as per 335-13-4-.20(2)(h)
- Recorded notation on land deed following closure, as per 335-13-4-.20(2)(i) and (j)
- Professional engineer certification following completion of post-closure care period, as per 335-13-4-.20(3)(e)

10.3 Notification to ADEM

The Multistate Trust will notify ADEM when documents referenced in 335-13-4-.29(1)(b) [namely, permitted application and related documentation] has been placed in the operating record. All information placed in the operating record will be furnished to ADEM upon request and/or made available at all reasonable times for inspection by ADEM.

**TABLE 1: GROUNDWATER MONITORING WELL
AND PIEZOMETER INVENTORY AROUND THE
IRON OXIDE STORAGE IMPOUNDMENTS AND LANDFILL
THE MULTISTATE TRUST
MOBILE, ALABAMA**

WELL ID	ADEM DMR WELL ID	GROUND ELEVATION, FT-NGVD	TOP OF CASING ELEVATION, FT- NGVD	TOTAL WELL DEPTH, FT	ADEM TYPE
*+ P-1	GW43	21.19	24.16	80.66	III
*+ P-2	GW42	21.03	23.96	80.43	III
*+ P-3	GW41	17.78	20.48	80.16	III
PN-1	---	18.36	22.10	17.31	II
# PN-2	---	18.93	21.90	16.94	II
~ PN-3R	---	---	21.14	20.00	II
~ PNC-1	---	---	21.67	16.00	II
PS-1	---	19.80	22.19	20.04	II
PS-2	---	19.62	22.05	22.18	II
PS-3	---	18.94	21.99	19.71	II
PE-1	---	20.04	22.94	19.91	II
PE-2	---	19.35	22.56	17.30	II
PE-3	---	15.51	19.83	14.97	II
* E-6R	GWM3	21.23	22.83	22.66	II
* MW-34	GW17	18.25	21.35	72.17	III
* MW-35	GW15	19.95	24.15	79.06	III
* MW-36	GW13	19.01	21.83	72.09	III
* MW-38	GW11	18.66	21.55	11.93	II
* MW-40	GW28	19.64	22.23	20.74	II
* MW-41	GW27	19.59	22.32	12.37	II
* MW-42	GW24	20.14	23.06	19.30	II
* MW-43	GW23	20.31	23.36	13.88	II

**TABLE 1: GROUNDWATER MONITORING WELL
AND PIEZOMETER INVENTORY AROUND THE
IRON OXIDE STORAGE IMPOUNDMENTS AND LANDFILL
THE MULTISTATE TRUST
MOBILE, ALABAMA**

WELL ID	ADEM DMR WELL ID	GROUND ELEVATION, FT-NGVD	TOP OF CASING ELEVATION, FT- NGVD	TOTAL WELL DEPTH, FT	ADEM TYPE
* MW-44	GW22	18.28	21.51	18.45	II
* MW-46	GW37	18.20	21.63	12.26	II
* MW-47	GW36	21.37	24.22	15.67	II
* MW-48	GW33	19.85	22.78	15.18	II
* MW-49	GW31	18.72	21.86	18.30	II
* MW-60	GW49	21.93	24.99	21.37	II
* MW-61	GW48	23.19	25.42	20.14	II
* MW-62	GW47	25.60	28.22	20.54	II
* MW-63	GW46	23.19	25.81	14.53	II
* MW-64	GW45	23.33	26.06	18.31	II
*# MW-65	GW44	24.77	27.04	14.91	II
*~ MW-66	---	---	21.19	19.72	II
*~ MW-67	---	---	25.14	19.83	II
*~ MW-68	---	---	32.86	21.64	II
*~ MW-69	---	---	26.84	19.53	II
* NS	GW25	19.09	21.96	11.3	II
* ND	GW26	19.15	21.83	75.5	III
* NE	GW16	20.18	23.33	13.5	II
* NW	GW35	19.23	21.57	20.0	II
* N1	GW14	19.93	23.14	13.2	II
* N2	GW29	19.47	21.65	12.0	II
* N5	GW38	19.12	21.84	19.5	II
* N6	GWM5	21.87	25.71	18.6	II
* N7	GWM7	23.14	26.32	20.8	II

**TABLE 1: GROUNDWATER MONITORING WELL
AND PIEZOMETER INVENTORY AROUND THE
IRON OXIDE STORAGE IMPOUNDMENTS AND LANDFILL
THE MULTISTATE TRUST
MOBILE, ALABAMA**

WELL ID	ADEM DMR WELL ID	GROUND ELEVATION, FT-NGVD	TOP OF CASING ELEVATION, FT- NGVD	TOTAL WELL DEPTH, FT	ADEM TYPE
* ES	GWMQ	19.70	21.59	12.5	II
* ED	GWM8	18.92	21.30	81.5	III
* ~ E1R	GWM4	---	21.48	18.77	II
* E2	GWM6	18.86	19.65	13.9	II
* E3	GW1Q	18.95	20.24	13.5	II
* E4	GW18	19.31	20.40	13.5	II
* ~ E5R	GWM2	---	21.61	20.13	II
* SS	GW3Q	18.83	20.94	11.7	II
* ~ SDR	GW32	---	21.98	82.81	III
* SE	GWM1	20.04	24.25	19.5	II
* S1	GW4Q	18.70	21.95	19.5	II
* S2	GWMR	18.90	21.34	19.5	II
* S3A	GW19	24.02	25.62	18.0	II
* S4A	GWM9	23.06	24.92	18.0	II
* ~ W1R	GW34	---	24.19	19.5	II

NOTE:

* indicates these wells are sampled quarterly for pH, Cl, TDS, Fe, Pb, Al, Be, Cd, Cr, Mn, Ni, Zn, specific conductance, temperature and turbidity, in addition to groundwater elevation.

All monitor wells were surveyed on April 27 and 28, 2010 except those noted with the below symbol.

+ surveyed April 2, 2002

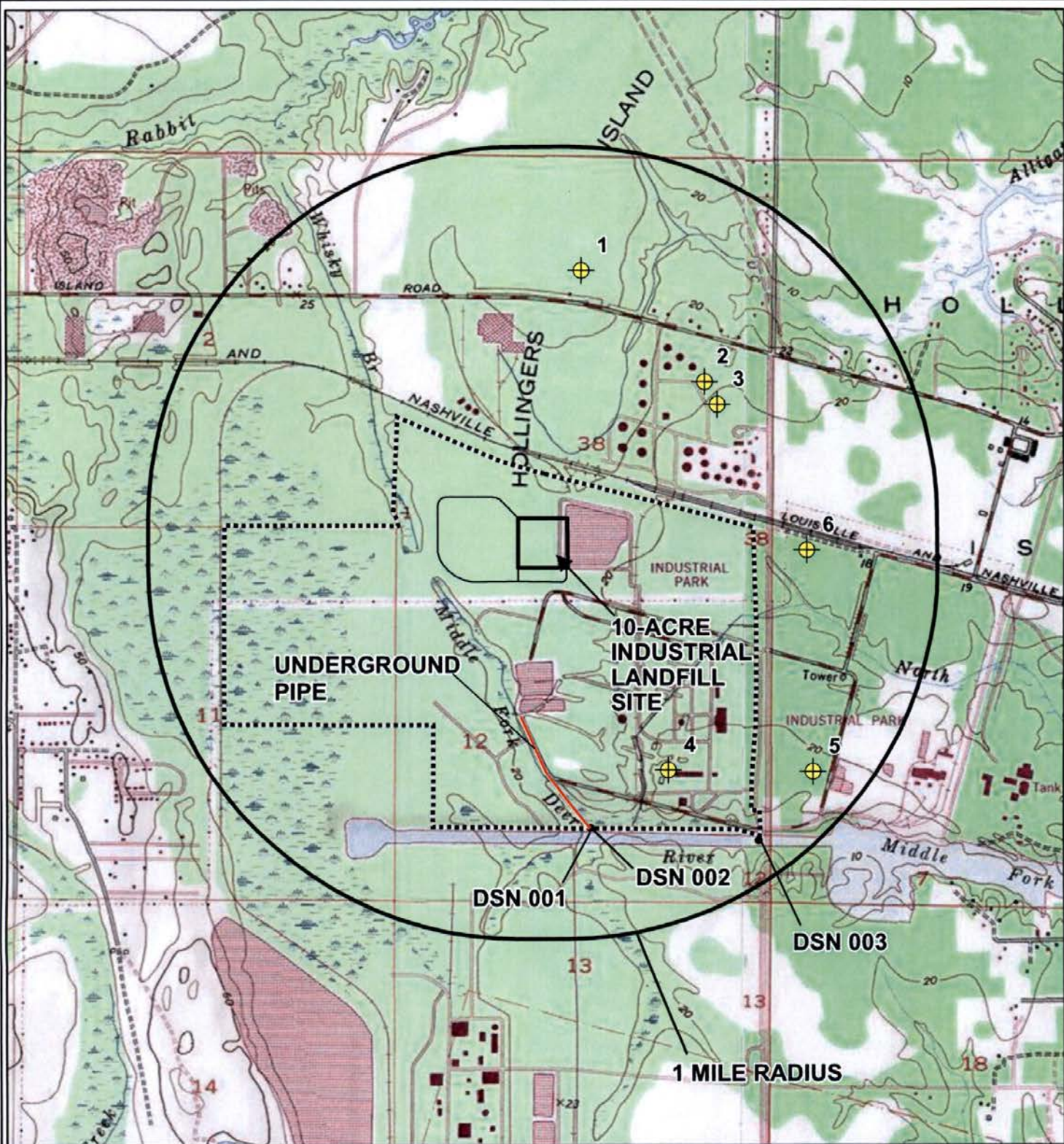
^ surveyed March 24, 2003

surveyed on May 23, 2012



~ New piezometer/monitoring well installed in September 2018 and surveyed on October 29, 2018

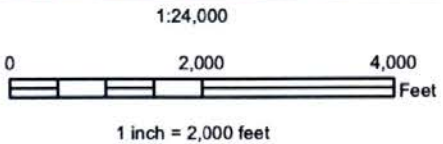
ADEM Type II wells are screened within the Alluvial-Coastal aquifer.

ADEM Type III wells are screened within the Pliocene-Miocene aquifer.



LEGEND

-  Water Well Location
-  Denotes Facility Property Boundary (Approx.)



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FORMER KERR-MCGEE TITANIUM
DIOXIDE BENEFICIATION PLANT



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MULTISTATE TRUST LLC



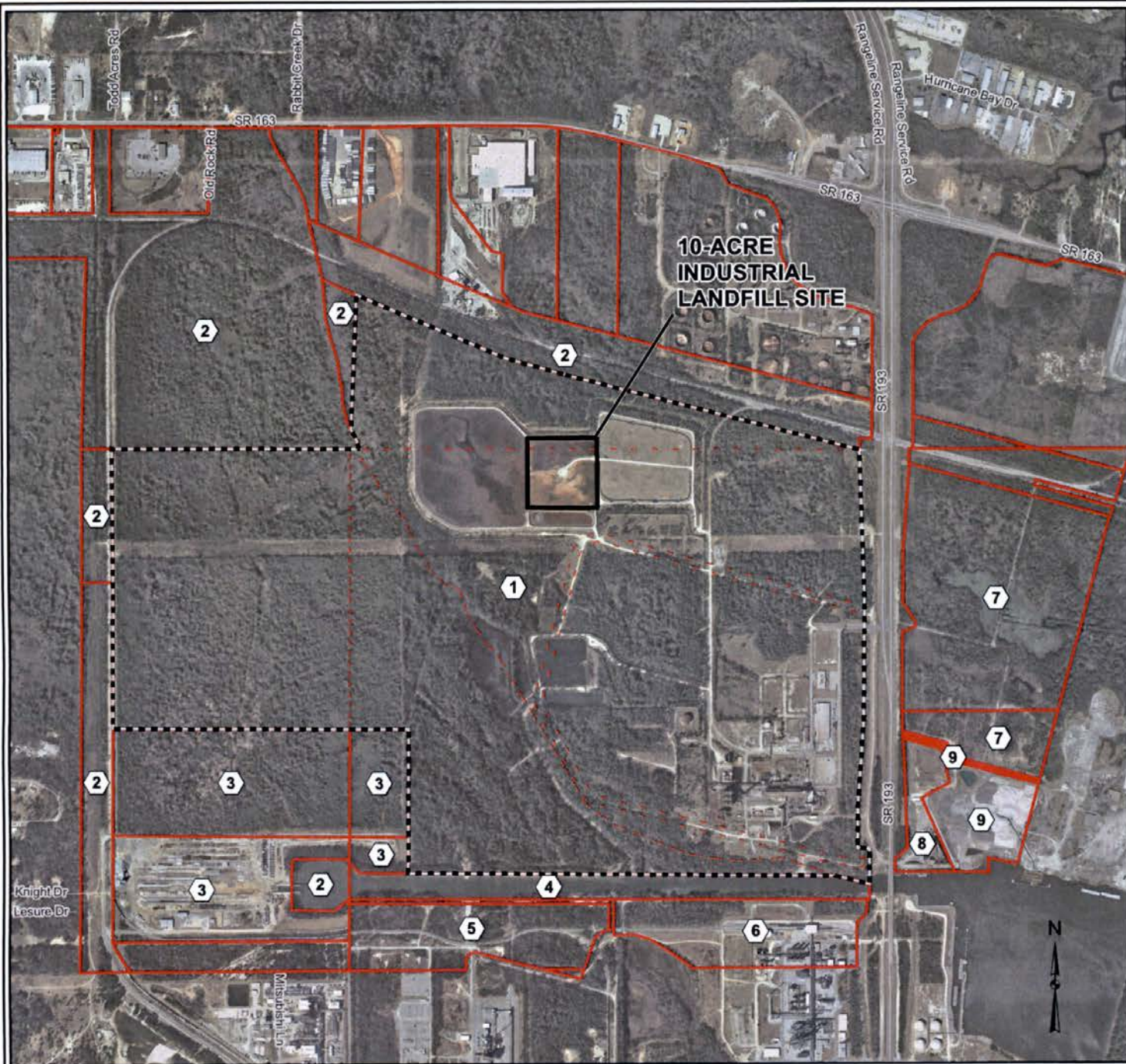
thompson
ENGINEERING

**FIGURE 1
SITE VICINITY MAP**

PROJECT NO.:
19-1101-0007

DATE:
FEBRUARY 2019

P:\2019\Projects\110119-1101-0007 Greenfield Annual Monitor\Working\Environmental\GIS\MXD\FIG1.mxd



- 1 GREENFIELD ENVIRONMENTAL MULTISTATE TRUST L.L.C.
- 2 ALABAMA STATE DOCKS DEPARTMENT
P.O. BOX 1588
MOBILE, AL 36601
- 3 INDUSTRIAL DEVELOPMENT
c/o STANDARD CONCRETE PRODUCTS
P.O. BOX 1360
COLUMBUS, GA 31902
- 4 STATE OF ALABAMA
P.O. BOX 1588
MOBILE, AL 36601
- 5 DEGUSSA-HULS CORPORATION
SATCHEL CHICK & KAPFER INC.
5915 IRON GATE TRACE
CUMMING, GA 30040
- 6 INEOS PHENOL INC.
c/o THOMSON REUTERS
400 WEST 15TH STREET, STE. 700
AUSTIN, TX 78701
- 7 HOLMAN INC.
c/o HOLCIM (US) INC.
TAX DEPT.
201 JONES RD.
WALTHAM, MA 2451
- 8 BROTHERS ENTERPRISES L.L.C.
4000 YUCCA DRIVE
THE ODORE, AL 36852
- 9 THEODORE HOLDING L.L.C.A.
c/o SUPERIOR STONE CO MGR
2710 WYCLIFF RD
RALEIGH, NC 27607

DATA SOURCES:
 Ownership Information: City of Mobile City Map (<http://maps.cityofmobile.org/citymap/index.html>) and Mobile County Revenue Commission Tax Records (<http://www.mobile-propertytaxal.com/>).
 Property Boundaries: NOT A SURVEY. Property boundaries are approximate and merely for representation of ownership. No warranties as to their accuracy are made.

FORMER KERR-MCGEE TITANIUM
DIOXIDE BENEFICIATION PLANT

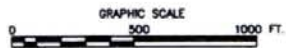
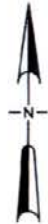


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FIGURE 2
ADJACENT PROPERTIES TO THE
MULTISTATE TRUST FACILITY BOUNDARIES

PROJECT NO.:	DATE:
19-1101-0007	FEBRUARY 2019



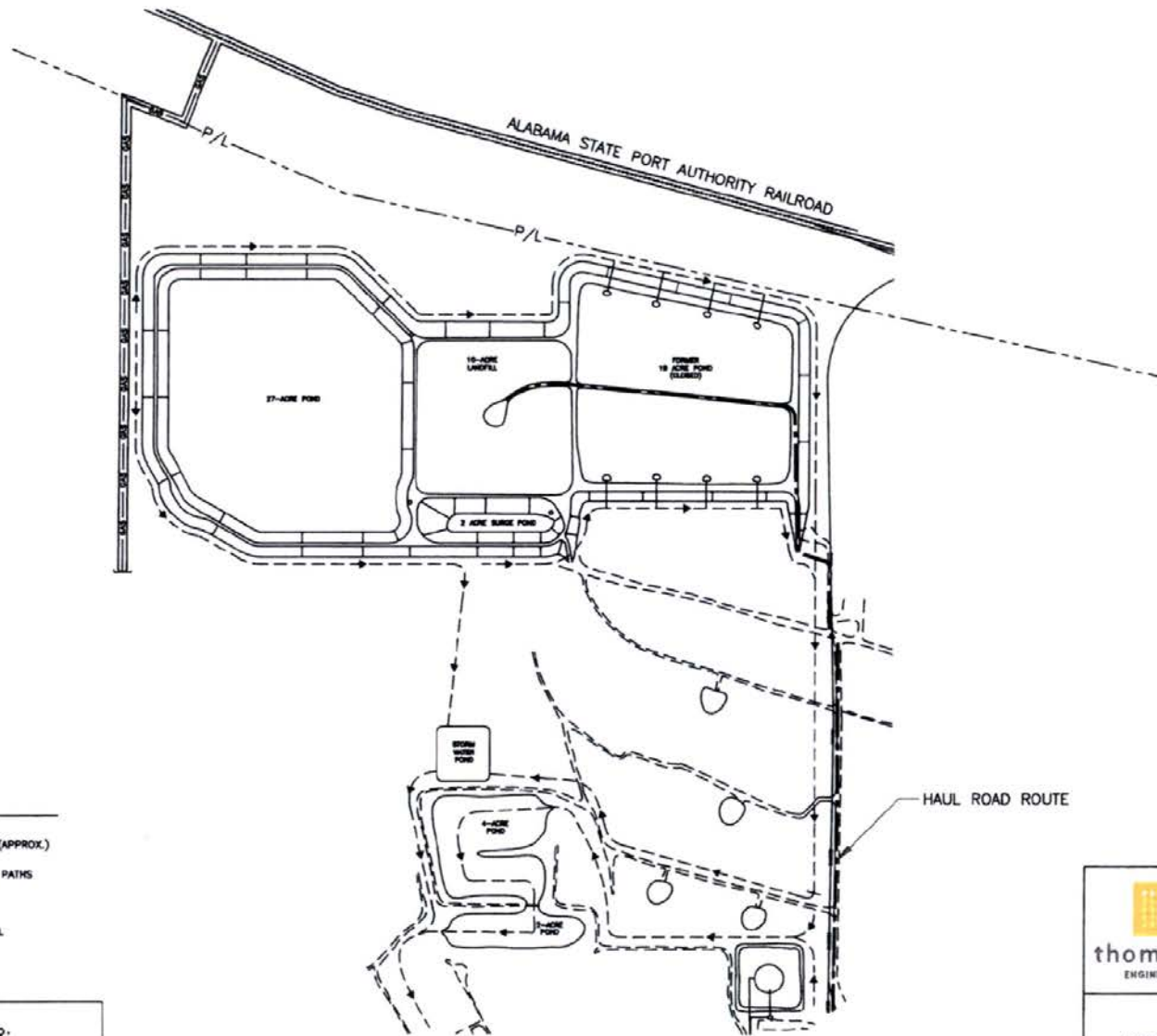
THE INFORMATION DEPICTED IS INTENDED TO PROVIDE VISUAL AID WITHIN THE CONTEXT OF THIS REPORT AND SHOULD NOT BE USED AS A SOLE REFERENCE IN PRECISE DIMENSIONING OF FEATURES INDICATED.

LEGEND

- P/L — FACILITY PROPERTY BOUNDARY (APPROX.)
- - - - - STORM WATER DRAINAGE FLOW PATHS
- DSN 002 NPDES PERMIT DISCHARGE
- - - - - HAUL ROAD ROUTE TO LANDFILL



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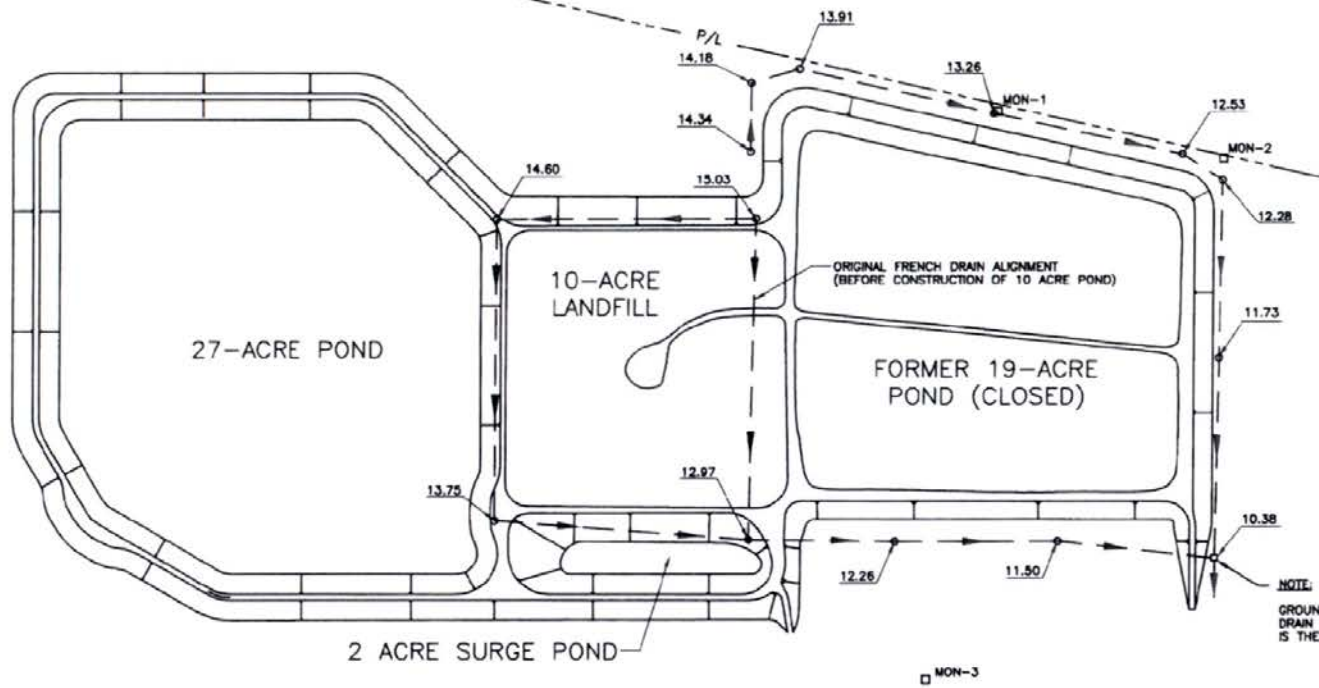
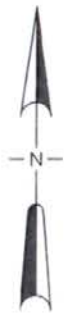
[PLANT PROCESS AREA]



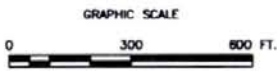
THE MULTISTATE TRUST
THEODORE INDUSTRIAL PARK
MOBILE COUNTY, ALABAMA
10 ACRE LANDFILL

FIGURE 3
SITE PLAN SCHEMATIC, IRON OXIDE PONDS
AND LANDFILL

PROJECT NO: 19-1101-0007 DATE: FEBRUARY 2019



NOTE:
GROUNDWATER RECOVERED BY PERIMETER FRENCH DRAIN SYSTEM FLOWS BY GRAVITY TO SUMP AND IS THEN PUMPED TO WASTEWATER TREATMENT FACILITIES.




LEGEND

- FRENCH DRAIN MANHOLE, INVERT IN FT.-MSL
- FRENCH DRAIN ALIGNMENT, ARROW SHOWS GRAVITY FLOW DIRECTION

TABLE OF CONTROL MONUMENTS			
MONUMENT	NORTHING	EASTING	ELEVATION
MON-1	199,323.111	301,257.251	19.125
MON-2	199,212.389	301,813.380	19.910
MON-3	197,915.238	301,090.623	20.765
MON-4	197,727.161	301,720.844	19.670

- NOTES:**
1. ALL MONUMENTS ARE RAILROAD SPIKES SET IN CONCRETE.
 2. NORTHINGS AND EASTINGS ARE IN STATE PLANE COORDINATES ALABAMA EAST (NAD27).
 3. ELEVATIONS ARE IN FEET MVD.

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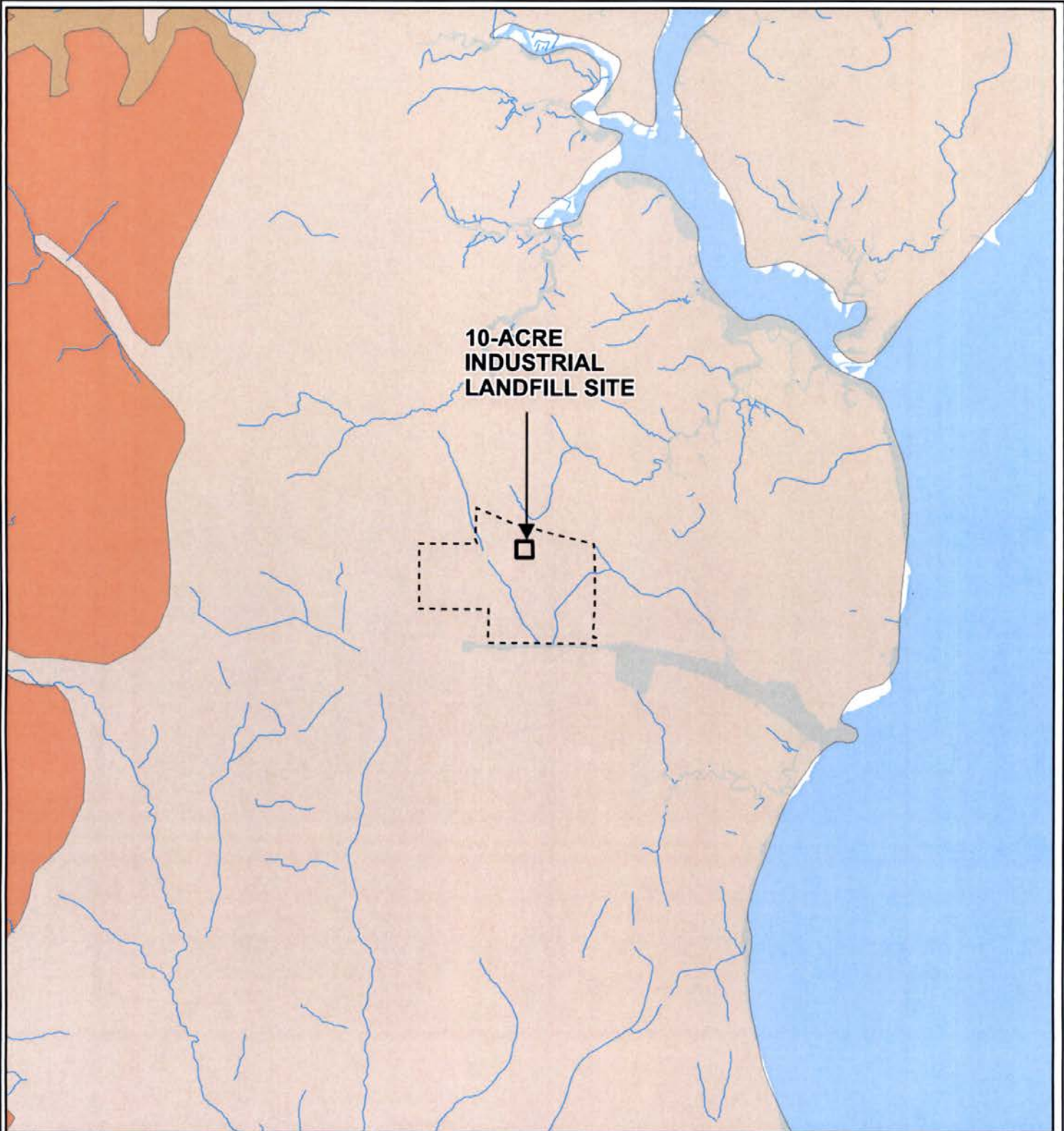
THE MULTISTATE TRUST
THEODORE INDUSTRIAL PARK
MOBILE COUNTY, ALABAMA
10 ACRE LANDFILL

FIGURE 4
PERIMETER FRENCH DRAIN GROUND
WATER CONTROL SYSTEM




PROJECT NO:
19-1101-0007

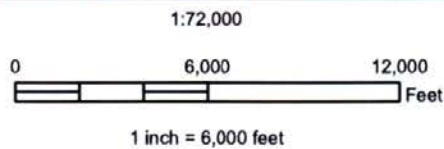
DATE:
FEBRUARY 2019

P:\2019\Projects\110119-1101-0007 Greenfield Annual Monitor\Working\Environmental\GIS\MXD\FIG5.mxd



Legend

-  Quaternary Alluvial, Coastal, and Low Terrace Deposits
-  Citronelle Formation
-  Miocene Series undifferentiated



Digital Geologic Map of Alabama - Area 13

FORMER KERR-MCGEE TITANIUM
DIOXIDE BENEFICIATION PLANT



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MULTISTATE TRUST LLC



thompson
ENGINEERING

**FIGURE 5
REGIONAL GEOLOGICAL MAP**

PROJECT NO.:
19-1101-0007

DATE:
FEBRUARY 2019

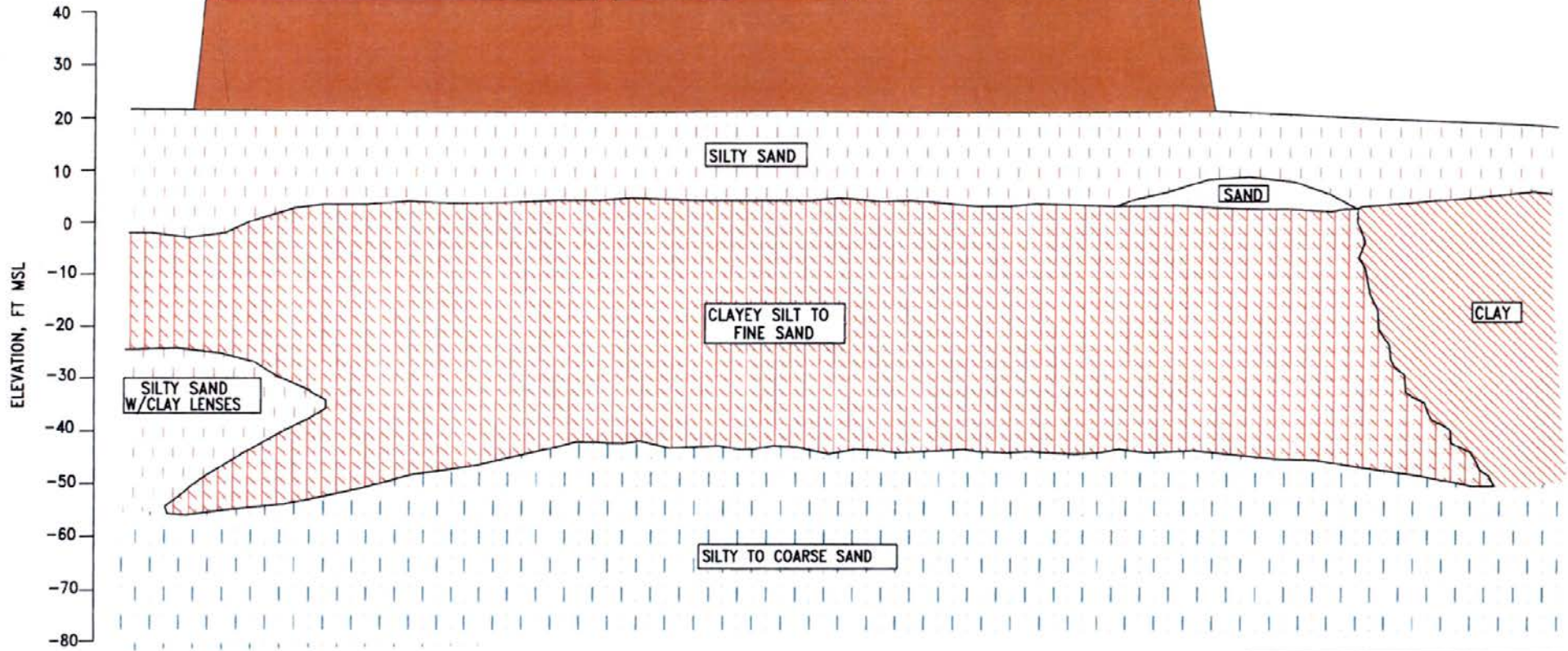
WEST

FORMER 19-ACRE IMPOUNDMENT

EAST

27-ACRE IMPOUNDMENT

FORMER 10-ACRE IMPOUNDMENT




ELEVATION, FT MSL

0 20 FT
VERTICAL SCALE

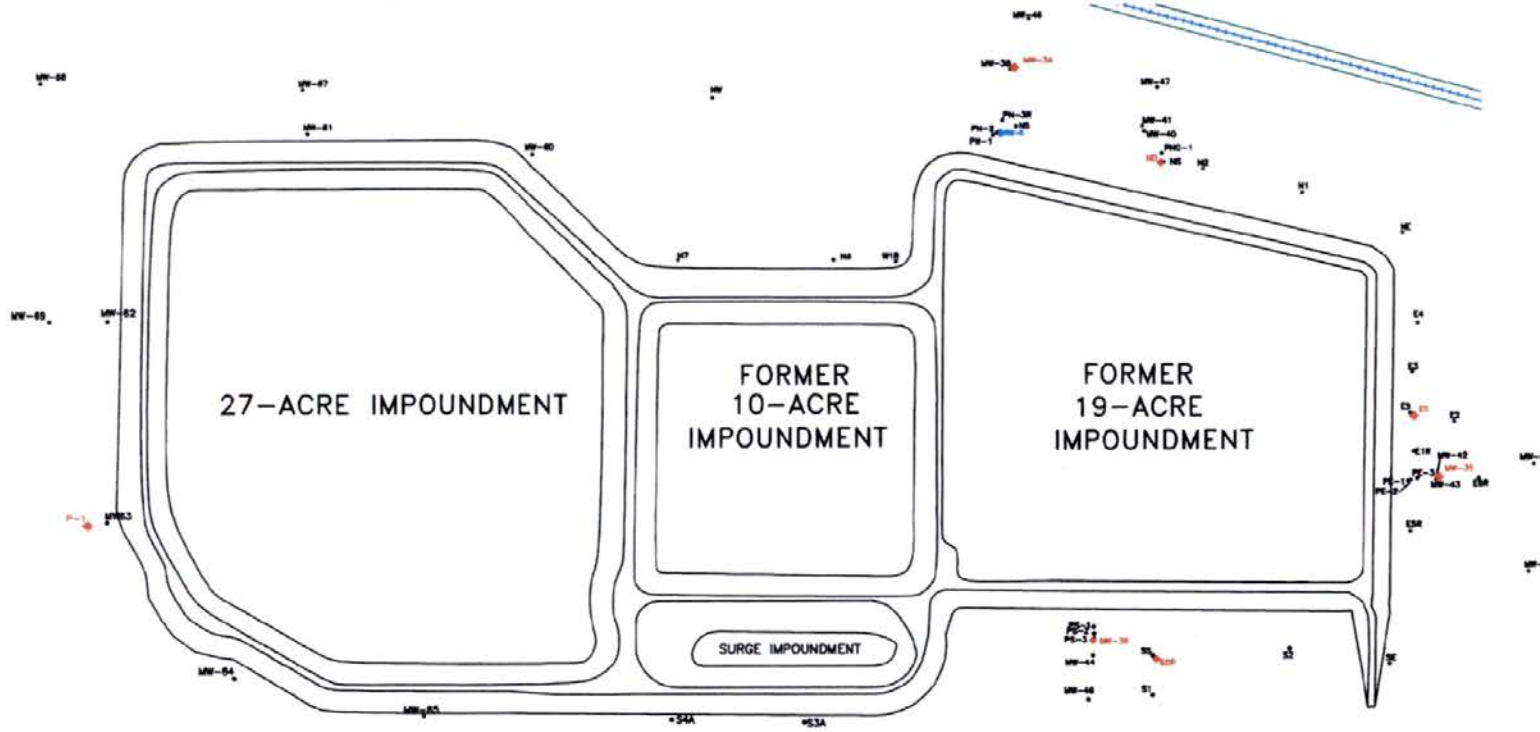
0 300 FT
HORIZONTAL SCALE

NOTE: REFER TO THOMPSON ENGINEERING REPORT DATED MAY 1991, ENTITLED "GROUNDWATER CONTAMINATION ASSESSMENT, KERR MCGEE CHEMICAL CORPORATION, THEODORE INDUSTRIAL PARK, THEODORE, ALABAMA".

	<p>FORMER KERR-MCGEE TITANIUM DIOXIDE BENEFICIATION PLANT MOBILE, MOBILE COUNTY, ALABAMA</p>
<p>FIGURE 6 GENERALIZED EAST-WEST CROSS SECTION THROUGH THE FORMER STORAGE IMPOUNDMENT AREA</p>	
<p>PROJECT NO: 19-1101-0007</p>	<p>DATE: FEBRUARY 2019</p>

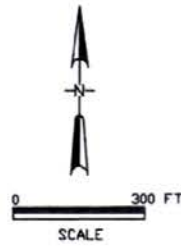


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LEGEND

- MW-1 SHALLOW WELL/PIEZOMETER (ALLUVIAL-COASTAL AQUIFER)
- ◆ MW-2 DEEP WELL/PIEZOMETER (PLIOCENE-MIOCENE AQUIFER)
- ⊕ RW-1 RECOVERY WELL



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MULTISTATE TRUST LLC



FORMER KERR-MCGEE TITANIUM
DIOXIDE BENEFICIATION PLANT
MOBILE, MOBILE COUNTY, ALABAMA

FIGURE 7
MAP SHOWING LOCATION OF MONITOR
WELLS AND PIEZOMETERS

PROJECT NO.	19-1101-0007	DATE	FEBRUARY 2019
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Attachment I
Waste Characterization Information
(Information Submitted in Previous Permit Applications)

Attachment II

Landfill Boundary Survey and Legal Description (Information Submitted in Previous Permit Applications)

Attachment III

Documentation Regarding Original Liner Construction for 10-acre Impoundment (Information Submitted in Previous Permit Applications)

Attachment IV

**Landfill Engineering Drawings
(Information Submitted in Previous Permit Applications)**

Attachment V

**Standard Operating Procedures for
10-acre Iron Oxide Landfill
(Information Submitted in Previous Permit Applications)**

Attachment VI

**Resumes of Professionals Experienced with Prior
Hydrogeological Investigations**

Stephen M. O'Hearn, P.G., LEED AP

Supervisor, Environmental Services

Assignment: Senior Project Manager
Firm: Thompson Engineering
Years' Experience: With This Firm: 23
With Other Firm: 0
Education: BS/1993/Geology
Registration: Professional Geologist:
Alabama #0841
Arkansas #1876
Florida #2348
Mississippi #0028
Tennessee #4984
LEED Accredited Professional

Alabama Dept. of Conservation and Natural Resources (ADCNR), Marsh Island Restoration, Portersville Bay, Mississippi Sound, Ongoing – Project Manager for the restoration of salt marsh and provide shoreline protection at Marsh Island in the Mississippi Sound. The Island had been experiencing 5-10 ft. of shoreline loss per year. The project included the placement of 3,500-ft. of OysterBreak™ structures to stabilize the shoreline of the existing 20-acres and the creation of an additional 50-acres of marsh. The project also included permitting, hydrologic modeling, tidal creeks, borrow source investigation and placement of dredged material for fill, and planting native marsh vegetation.

Experience and Qualifications

Mr. O'Hearn is Thompson's Environmental Manager. He manages environmental engineers, geologists, biologists, scientists, GIS specialist, and planners assigned to the Environmental Services Group. He has also performed as a Project Manager and/or environmental technical lead on various types of projects.

His technical experience includes:

- National Environmental Policy Act (NEPA) studies
- Soil and groundwater contamination
- Phase I and Phase II Environmental Site Assessments
- Underground Storage Tank (UST) assessments and closures
- Subsurface explorations (push-probe and conventional drilling techniques)
- Monitor well installation, development, and monitoring
- Environmental sampling
- Indoor air quality
- Brownfields investigations
- QA/QC protocol
- Corrective action plans
- Risk-based corrective action evaluations

Mobile Bay National Estuary Program (MBNEP), Mon Louis Island Shoreline Stabilization, Mobile County, AL, Ongoing – Sr. Project Manager for the creation of an additional 4-acres of marsh to restore the island and to enhance/create aquatic, wetland, and upland habitats. The project also involved dredging the Fowl River Federal Navigation Channel, installation of a rubble mound breakwater to stabilize the shoreline, and the evaluation of borrow material for fill. The project involved subsurface investigations, permitting, alternatives evaluation (living shoreline, marsh configuration, etc.), engineering design, and construction inspection.

Mobile Bay National Estuary Program, Regenerative Step Pool Storm Conveyance (SPSC), Baldwin County, AL, 2014 – Project Manager for a SPSC system that was designed and constructed to repair a deeply eroded steam channel and to dissipate energy of higher flow events. The network consisted of rock riffles, boulders, and 25 plunge pools to stabilize the 1,000-ft. slope. The project also included restoration of degraded wetlands severely impacted by sedimentation including sediment removal and wetland plantings. This type of project is a first in Alabama and received awards from the EPA and the International Green Apple Award.

City of Fairhope, Fly Creek Restoration Evaluation, Fairhope, AL, 2014 – Project Manager for the Fly Creek restoration evaluation to identify measures to restore natural resources in the coastal stream and its associated watershed. The watershed that feeds Fly Creek is 5,018-acres. The areas of restoration focused on degraded streams and wetlands, stormwater management, land use

Project Experience

Coastal / Stream Restoration

practices, preservation of natural areas and open space, and the creation of riparian buffer.

City of Gulf Shores, Master Plan for Public Beach and Little Lagoon, Gulf Shores, AL, 2014

– Project Manager for the development of a Master Plan for the City's vision of a "Small Town, Big Beach" that would make Gulf Shores a world-class beach destination. The project involved stakeholder interview and analyses, a design charrette, development of three alternatives, and conceptual design including low impact development (LID) practices. The budget was developed using a phased approach with a rough order of magnitude cost totaling \$29-million.

Kinder Morgan, Gulf LNG Marsh Creation, Pascagoula, MS, 2016

– Project Manager for the creation of a 50-acre tidal salt marsh area in the Mississippi Sound. The marsh design involved establishing elevations for the breakwater and marsh, intertidal creeks/channels, and mudflats. The project included subsurface exploration, topographic and hydrographic surveying, various design configurations, coastal modeling, evaluation of suitability of fill materials, settlement predictions, permitting assistance, and shoreline stabilization (breakwater) design.

Mobile Bay National Estuary Program, Weeks Bay Watershed Management Planning, Baldwin County, AL, Ongoing

– QA/QC Manager for the development of a Comprehensive Watershed Management Plan to restore or conserve the Weeks Bay Watershed and improve water and habitat quality. The Watershed encompasses 130,000-acres and includes the Fish River and Magnolia River drainage basins. Key factors of the plan include watershed characterization, wetlands assessment, delineation of watershed management units, sea level rise and climate change assessment, conceptual engineering, and public outreach.

The Nature Conservancy, Coastal Process Analysis for the Pelican Point Living Shoreline, Baldwin County, AL, Ongoing

– Project Manager for the evaluation of the shoreline due to the construction of the Pelican Point Living Shoreline project. Recommendations included a path forward involving beach nourishment, long-term shoreline monitoring, and modeling. During the project, data gathering and evaluation included local and regional sediment budgets; wind, wave, current, and tidal information; borings; topographic, bathymetric, and pre/post construction surveys (TNC/DISL); and shoreline change analysis based

on historical aerial photographs. The summary report included data findings, gaps, and assessment of viability and summarized seasonal variability with regards to sediment movement along the shoreline, erosion/depositional trends, and general shoreline response at the living shoreline project.

Alabama State Port Authority (ASPA), Choctaw Point Terminal, Design of Mitigation Areas, Mobile, AL

– Environmental Manager for the detailed design, preparation of construction documents, and construction oversight for the wetlands mitigation project. The scope involved the restoration and creation of tidal marsh in three areas, totaling over 57 acres, to replace wetlands and water bottoms that were lost during the development of the terminal. The mitigation sites required significant soil excavation and removal to establish elevations and hydrologic regimes appropriate for the marsh plant community. The topography, soils, and local tidal hydrology were evaluated to ensure creation of a productive marsh to support fish, macroinvertebrate, and wildlife communities.

Ecological Investigation

Alabama Power, Wetland and Ecological Services, Statewide, AL, Ongoing

– Project Manager for the delineation of wetlands and locating threatened and endangered species. The project has included over 574 miles of powerline maintenance in existing easements as well as new alignments throughout the State. In total, more than 1,300 wetlands have been delineated and more than 1,600 endangered species have been identified.

Eglin Air Force Base, Wetlands Delineation and Permitting, Florida

– Environmental manager for the wetland delineations and permitting on five replacement bridges on Range Road 211 and for a new Sniper KD Range. Thompson Engineering performed Design/Build services for replacement of failed one-lane bridges in the northern area and construction of a new sniper firing range on Eglin AFB near Crestview. Jurisdictional wetlands were delineated and marked in the field at the five bridge locations and a wetland survey report prepared. Mr. Eubanks coordinated with the U.S. Army Corps of Engineers, Jacksonville District and the Florida Department of Environmental Protection regarding compliance with the required wetland permits for replacement of these bridges and the sniper range.



City of Fairhope, Development of LID Regulations and Incentives, Fairhope, AL, 2015

– Project Manager for the development of Low Impact Design (LID) Allowances Plan to provide a set of standards for the use of LID techniques in the City (15+ sq. miles) and the planning jurisdiction (73+ sq. miles). The plan addressed design considerations for wet basins, rain gardens, permeable pavement systems, sand filters, grass swales, grass buffers, wetland channels or wetlands, step pool stormwater conveyance structures, in-line stormwater storage, site design for wetlands and water body conservations, restoration of habitat or wetlands and water bodies, greenways, restoring channel morphology and natural function, bio-retention, and level spreaders.

Dredging / Dredge Material Evaluation

Plains Marketing, Maintenance Dredging, Mobile, AL, 2016 – Project Manager for routine dredging maintenance that involves contract dredging, sediment characterization, dredge plans and specifications, permitting, dredge disposal coordination, hydrographic survey, certification of removed volume, and construction inspection. The area encompasses three acres and is in the vicinity of the Plains bulk loading dock along the Mobile River. Dredging is performed to a depth of -44 MLLW and dredge materials are disposed of in a Dredge Material Management Area (DMMA). As part of the scope, material must be removed from the DMMA for off-site disposal.

City of Pass Christian Harbor Expansion, Pass Christian, MS – Environmental Scientist for a 20-acre harbor basin. The project involved development of an environmental permit application and dredging as well as design and construction of berths and breakwater protection. Ms. Montgomery developed a sampling analysis plan for chemical and bioaccumulation analyses of dredge materials, oversaw vibracore sampling in the Mississippi Sound, and developed the characterization report using analytical and bioaccumulation results.

NEPA (EIS, EA, CE)

Alabama Department of Transportation, NEPA Documentation (CE), I-10 Texas Street – Environmental Manager - Due to high number of traffic incidents at the west tunnel entrance/exit at Interstate 10 at the Mobile River, ALDOT selected Thompson Engineering to provide turn-key services for all aspects of the design and preparation of National Environmental Policy Act (NEPA) documentation which included tasks such as: public

involvement, conceptual design, environmental impact analysis, social/economic analysis, and alternative analysis.

Florida Department of Transportation, Permitting/Categorical Exclusion, Escambia County, FL, 2009 – Thompson's responsibilities include: preliminary project research; permitting; the establishment of wetland jurisdictional lines; the preparation of aerial maps showing the jurisdictional boundaries of wetlands and surface waters; coordination with State environmental agencies (ADEM and FDEP), U.S. Army Corps of Engineers, and acquiring verification of the jurisdictional lines; identification of and type of impacts of wetlands within the project limits; field reviews; and written assessments. In addition, the project required a FHWA NEPA document (categorical exclusion) to be performed.

Calhoun County Highway Department, Environmental Assessment, Calhoun County, AL, 2004 – Project manager for the NEPA portion of 8 FEMA funded evacuation routes. Thompson Engineering was selected to provide turn-key environmental, engineering design, survey, and construction management of this ten million dollar project. Mr. O'Hearn and his team provided the preparation of eight environmental documents which included replacement of seven bridges and upgrades to an approximate 12 mile road section.

Baldwin County Highway Department, Environmental Assessment, Baldwin County, AL – Project Manager for the development of a FHWA NEPA document for a 12-mile section of roadway for a Hurricane Evacuation Route along County Road 83. Thompson Engineering provided public involvement; regulatory coordination; wetlands assessment; threatened and endangered species survey; and cultural resources survey.

Alabama Department of Transportation, Environmental Assessment, Baldwin County, AL – Project manager for the development of a FHWA NEPA document for a 1-mile section of roadway and new I-10 Interchange for a Hurricane Evacuation Route along County Road 83. Thompson Engineering was selected to provide turn-key environmental, engineering design, and surveying services.

Florida Department of Transportation, Environmental Assessment, 3rd District – QA/QC manager for the development of ten environmental evaluations located throughout the 3rd District.



Thompson Engineering was selected to provide turn-key environmental and engineering analysis.

Mississippi Army National Guard, Environmental Assessment, Camp Shelby, MS, 2005 – The Mississippi Army National Guard (MSARNG) required an Environmental Assessment to address the impacts that would potentially result from the construction and operation of a new Wastewater Treatment Facility and the closure of the existing Wastewater Treatment Plant. The purpose of this EA is to identify and discuss the anticipated environmental and socioeconomic impacts and to determine whether the proposed action has the potential to create significant impacts on the environment which would warrant a more detailed study of the possible impacts, mitigation, alternative courses of action, and preparation of an Environmental Impact Statement (EIS) to address the action.

Troup County, Environmental Assessment, LaGrange, Troup County, GA, 2005 – Project Manager for development of a NEPA document to evaluate two primary actions: (1) conduct a limited public involvement effort to solicit the opinions of the public on proposed Celebration Center; and (2) prepare an EA and "Finding of No Significant Impact" (FONSI) to address the environmental effects attributable to the Celebration Center and related development activities within the Pyne Road Park.

U.S. Department of Veterans Affairs and Tennessee State Veterans Homes Board, Environmental Assessment, Cleveland, Tennessee – QA/QC Manager for the development of a National Environmental Policy Act (NEPA) EA for a new 108 bed 98,000 sq. ft. living facility. The EA was prepared to comply with Department of Veterans Affairs requirements as part of a grant application. Thompson Engineering provided a Phase I ESA and EA that included; regulatory coordination; wetlands assessment; threatened & endangered species survey; cultural resources survey; and facility design.

University of South Alabama, Specialized Laboratory Environmental Assessment (EA), Mobile, AL, 2010 – Project Manager for the development of a National Environmental Policy Act (NEPA) EA for a new 25,800 sq. ft. facility that will contain BSL-2, BSL-3, and ABSL labs. The EA was prepared to comply with National Institutes of Health (NIH) requirements as part of a grant application. Thompson Engineering provided a Phase I ESA and EA that included; regulatory

coordination; wetlands assessment; T&E and cultural resources survey; and safety and security evaluation.

Regulatory Compliance and Permitting

Alabama State Port Authority, EPA Stormwater Compliance, Mobile, AL, 2010 – Project Manager for ensuring compliance with the Port's NPDES Stormwater Permits. Thompson Engineering reviewed existing documents and provided civil engineering, environmental consulting, and surveys to locate inlets, drainage, and outfalls; verified boundaries/operational limits and tenant locations; determined drain paths, possible pollution sources and impacts; permitting; BMP and SPCC plans revisions; and facility diagram updates.

Alabama Department of Transportation, Alabama Department of Environmental Management's Consent Agreement (CA), Mobile, AL – Project Manager for the U.S. Highway 98 Relocation project for environmental compliance requirements from multiple governmental agencies on the \$21 million 8-mile long grade/drain/and bridge.

CB&I Fabrication Facility, Site Development, New Hope, Marion County, TN, 2010 – Project Manager for the environmental portion of the site development team. Thompson Engineering provided environmental consulting services that included preparation of all permitting documents; such as, the TDEC Aquatic Resource Alteration Permit (ARAP), the TDEC storm water construction permit (NOI) and Storm water Pollution Prevention Plan (SWPPP), the joint TVA/USACE Form 26A, and the TDEC air permit. All services are provided under an accelerated time schedule with close coordination with the regulatory agencies having oversight of the water quality impacts, wetlands, threatened and endangered species, and historical and cultural resources.

Asbestos, Lead Based Paint, Hazardous Materials

Retirement Systems of Alabama (RSA), Van Antwerp Building Renovations, Mobile, AL – Project Manager / Environmental Consultant for the performance of the Hazardous Materials Survey and Abatement during the renovation of the 11-story, 58,300 sq. ft., historic Van Antwerp Building that was constructed in 1908 in downtown Mobile. The project also includes adding 11-stories totaling over 16,000 sq. ft. on the west side of the existing building. Environmental services included a pre-renovation hazardous materials survey, abatement



plans and specifications, and asbestos abatement oversight during demolition activities. Thompson is also responsible for the structural engineering design for the demolition, renovation, and addition as well as the building envelope inspections for the windows, roofing system, and facade.

Moss Construction Services, Roger Williams Housing Development, Hazardous Materials Survey, Civil & Hazmat Demolition Plan, Air Monitoring, Mobile, AL, Ongoing – Sr. Project Manager for the performance of the Hazardous Materials Survey prior to and during the demolition of the buildings and roads. The survey identified asbestos-containing materials, lead-based paint, and other hazardous and regulated materials. Thompson Engineering provided abatement plans, civil engineering demolition plans, abatement air monitoring and inspection services, quality monitoring, and NPDES permitting services.

Retirement Systems of Alabama, GM Building Hazardous Materials Survey, Mobile, AL, Ongoing – Project Manager for the performance of the Hazardous Materials Survey prior to and during the total renovation of a 34-story, high-rise office building. The survey identified asbestos-containing materials, lead-based paint, and other hazardous and regulated materials. Thompson Engineering provided abatement plans, structural engineering services, inspection of the building envelope, water tightness testing, contract administration, abatement air monitoring and inspection services.

Retirement Systems of Alabama, GM Building Asbestos Abatement Consulting, Mobile, AL, Ongoing – QA/QC Manager for providing asbestos and lead-based paint consulting services for the renovation of a 34-story high-rise office building in downtown Mobile. The building was constructed in 1965 and structural steel was coated with asbestos containing fireproofing. Thompson Engineering prepared detailed abatement plans and specifications for the abatement of lead-based paint and asbestos and conducting air monitoring during removal.

Soil and Groundwater Assessments / Remediation

Alabama Department of Transportation, I-10 River Bridge Preliminary Investigation, Mobile County, AL, Ongoing – Sr. Project Manager/QA/QC Manager for performing a hazardous materials preliminary investigation for the proposed I-10 Mobile River Bridge at ten properties located within the proposed bridge and/or right-of-way project limits. The project

involved performing borings, soil and groundwater sampling, temporary well installation, chemical testing, and reporting. In addition, Ms. Montgomery has worked on the following projects for ALDOT performing soil and groundwater assessments and remediation.

- U.S. Highway 72 Interchange Project, Madison Co., AL
- SR-35 Widening Project, Jackson Co., AL
- SR-181 Widening Project, Baldwin Co., AL
- CR-83 Widening Project, Baldwin Co., AL
- SR-13 Interchange Project, Washington Co., AL

Carter Oil Company, ADEM UST Soil and Groundwater Remediation, Sheffield, AL, Ongoing – Sr. Project Manager for multiple UST soil and groundwater remediation projects at a petroleum bulk storage and fueling facility. Responsibilities since 2010 have included coordination of monitor well installations and free product recovery activities, coordinating soil and groundwater sampling, analysis of data for remediation recommendations, writing Preliminary, Secondary, and Groundwater Monitoring Reports including GIS and CAD mapping, completing an ARBCA and CAPs, air and underground injection control permitting, coordinating the installation of an ozone sparging system, completing the ozone system CAI Report, reviewing bi-weekly operations and maintenance inspections of ozone sparging system, writing quarterly ozone CAE Reports including GIS and CAD drafting, etc. Currently coordinating chemical injection activities.

Nick's Conoco, ADEM UST Soil and Groundwater Remediation, Prichard, AL, Ongoing – Sr. Project Manager for multiple UST soil and groundwater remediation projects at an active retail gas station. Responsibilities since 2007 have included supervision of monitor well installations and free product recovery activities, performing/coordinating soil and groundwater sampling, analysis of data for remediation recommendations, writing Preliminary, Secondary, and Groundwater Monitoring Reports including GIS and CAD mapping, completing Alabama Risk Based Corrective Action Assessment (ARBCA) and CAPs, NPDES and air permitting, coordinating the installation of a dual phase extraction system, and completing the dual phase system CAI Report. Currently coordinating the bi-weekly operations and maintenance inspections of the dual phase system and the quarterly groundwater sampling events and writing quarterly dual phase CAE Reports including GIS and CAD drafting, etc.



Continental Motors, CMIP and Corrective Measures Implementation, Mobile, AL, Ongoing

– QA/QC Manager for multiple projects at the site involving the presence of cyanide in soil and groundwater. The project involved an initial subsurface investigation, neutral sump release investigation report, development of a Corrective Measures Implementation Plan (CMIP), UIC Class V Well Permit application, soil and groundwater sampling / monitoring, Vertical Badger System Injection install, in-situ chemical injection, future well abandonment, and reporting.

Rouse Properties, Shoppes of Bel Air Renovations, Mobile, AL, Ongoing

– QA/QC Manager for soil excavation and removal, groundwater sampling and monitoring, pre-demolition hazardous materials surveys (limited asbestos and lead-based paint), demolition plans and specifications, and reporting for the former standalone single story Sears Automotive Center. Pre-renovation hazardous materials surveys were also performed for retail spaces in the main mall that previously housed Sears, Champs, and Lady Foot Locker. Air monitoring was performed during remediation.

Celanese, Groundwater Assessment, Bucks, AL, Ongoing – Project Manager for a subsurface investigation characterizing the hydrogeology and contaminate flow beneath a chemical plant in Alabama. The study includes soil and groundwater sampling utilizing Geoprobe technology. Quarterly and semi-annual groundwater monitoring, chemical analysis and evaluation are required.

Alabama Department of Transportation, Soil and Groundwater Assessment, Chambers County, AL, Ongoing

– Conducted preliminary and secondary investigations during roadway construction on County Road 208. Delineated soil and groundwater contamination using conventional and direct-push methods. Based on the findings, a Risk Assessment (ARBCA) and Corrective Action Plan (CAP) will be developed. The CAP will include remediation by natural attenuation, enhanced natural remediation by oxygen release compound (ORC), and conventional pump-and-treat (groundwater recovery wells and air stripping treatment).

Kerr-McGee, Groundwater Remediation, Theodore, AL, Ongoing – Provide annual groundwater analysis of a groundwater recovery operation using five, 24-inch wells at the chemical plant in Alabama and approximately 2,000 ft. of

“French” drain. Analysis includes groundwater flow direction, gradient, cone of depression analysis, operational analysis, and 2-D modeling.

Eddie's Chevron, Groundwater Monitoring, Government Street, Mobile, AL, Ongoing

– Performs ADEM required quarterly groundwater monitoring activities and oversees MEME events. Responsible for coordinating quarterly groundwater sampling events, CAD design, report writing. Also has performed an Alabama risk based corrective action evaluation.

Alabama State Port Authority, Environmental Consulting, Pinto Island, Mobile County, AL, 2010

– Project Manager for a permitting, site investigations, remediation, and construction inspection of a 115 million dollar steel slab transfer facility located on Mobile River. Project includes USACE permit application and ADEM water quality certification. Subsurface activities include soil and groundwater sampling, laboratory analysis, soil remediation, and risk-assessment. Construction activities included over-site of NPDES permit compliance.

Alabama State Port Authority, Little Sand Island Subsurface Investigation, Mobile, AL, 2009

– Project Manager for a subsurface investigation of the island to evaluate Recognized Environmental Conditions (RECs) based on a Phase I ESA. The Coast Guard and Fire Dept. used the Island for fire fighting training on petroleum fires and ship fires and it also serves as a dredged material disposal facility. Thompson Engineering was responsible for the Phase I ESA, monitor well installation, soil and groundwater investigations, and analytical analysis.

Alabama State Port Authority, Frascati Yard Subsurface Investigation, Mobile, AL, 2009

– Project Manager for a subsurface investigation of a former railroad repair facility to evaluate recognized environmental conditions associated with the property based on the Phase I ESA. Thompson Engineering was responsible for the Phase I ESA, soil investigation, groundwater investigation, analytical sampling, Geoprobe, and temporary well installation.

Mitsubishi, Groundwater Remediation, Theodore, AL, 2008

– Provided emergency response consulting during a shut-down at a local industrial facility. The release included nitric acid and hydrofluoric acid from a trench at the sump area of a “clean” room. Services provided included soil and groundwater delineation, design and installation of a groundwater recovery system, and



ADEM coordination. Due to the critical time frame, all investigative, design, and installation services were completed in a six-day period.

Alabama State Port Authority, Soil and Groundwater Remediation, Mobile, AL, 2005 – Project manager for asbestos and lead-based paint surveys of the buildings, storage tanks, and pipelines utilized by various companies located at Choctaw Point. Project manager for an assessment at Choctaw Point using Geoprobe drilling techniques to delineate the horizontal and vertical extent of two groundwater plumes. In addition, remediation efforts included soil excavation, groundwater extraction and disposal, and introduction of an aerobic oxygen stimulant.

Alabama Department of Transportation, Soil Assessment, Jackson County, AL, 2005 – Conducted a preliminary investigation along State Highway 35 during a road widening project. The investigation included soil sampling using a Geoprobe direct push unit, soil collection, soil analysis, and evaluation.

Bebo's Car Wash, Soil and Groundwater Assessment, Mobile, AL, 2005 – Developed work plans and conducted petroleum contamination assessments to delineate the nature and extent of petroleum contamination from underground storage tanks, including review of groundwater and soil chemical data, slug tests, grain-size analysis, construction of potentiometric maps, characterization of groundwater flow, risk assessment, corrective action plan, soil excavation and disposal.

US Army Corp of Engineers and US EPA, Brownfield Assessment, Moultrie, GA, 2003 – Project manager for a brownfields investigation of a former meat-packing plant located in Moultrie Georgia. Funding was provided under U.S. EPA's Targeted Brownfields Assessment program. The investigation centered on the former engine room and boiler house. Services provided included Data Quality Objectives (DQO), Quality Assurance Project Plan (QAPP), public meetings, U.S. EPA coordination, subsurface investigation, and reporting.

Alabama Department of Transportation, Soil and Groundwater Assessment, Crenshaw County, AL, 1997 – Performed preliminary and secondary investigations during roadway construction on Highway 331. Delineated soil and groundwater contamination using conventional and direct-push methods. Used an on-site gas chromatograph for

field screening and confirmed results using laboratory analysis. Based on the findings, developed a conceptual Corrective Action Plan (CAP) for groundwater contamination. The CAP included remediation by natural attenuation, enhanced natural remediation by oxygen release compound (ORC), and conventional pump-and-treat (groundwater recovery wells and air stripping treatment).

Kerr-McGee, Groundwater Remediation, Hamilton, MS, 1996 – Supervised the installation of an approximate 500 ft. horizontal groundwater well used for the on-site remediation of groundwater at a chemical plant site.

Casino Development, Soil and Groundwater Assessment, Lemay, MO, 1996 – Directed a fast-track Phase II subsurface investigation at a 30 acre former chemical manufacturing facility in St. Louis, Missouri. The property is reposed as the site of a >\$50 million waterfront development. The investigation included soil and groundwater sampling and analyses, monitor well construction, sampling of residual solid wastes for toxicity characteristics, data interpretation, and coordination with the state regulatory agency.

Miscellaneous Phase I ESAs and Phase II Subsurface Investigations – Conducted numerous Phase I ESAs and Phase II Subsurface Investigations for real estate transactions throughout Alabama, Florida, and Mississippi. Services included site history, interviews, aerial photograph review, soil stratigraphy, groundwater flow characterization, regulatory record review, aquifer identification, soil and groundwater sampling, analysis, and evaluation.

Storage Tank Management

Casino Developer, UST Closure Assessment, Biloxi, MS, 1996 – Performed a fast-track UST closure assessment for a developer in Mississippi. During construction of a utility trench, three USTs were discovered. Responded within 24 hours to perform the assessment and immediately began excavation of the tanks (one 2100-gallon tank and two 10,000-gallon tanks). Findings and conclusions presented in the final report resulted in a "No Further Action" status from the Mississippi Department of Environmental Quality.

Landfills / Impoundments

Advanced Disposal Services, Inc., Landfill Development, Washington County, AL, 2007 – Project manager for development of a new



Municipal Solid Waste Landfill facility. The project includes all siting criteria, such as: wetlands, threatened and endangered species, noise analysis, cultural resources, geological interpretation, soil analysis, Phase I ESA, groundwater sampling, and surveying.

Other

British Petroleum, Dock Demolition and Repair, Mobile, AL, 2006 – Project manager for the demolition and design of a bulk petroleum facility dock (located on the Mobile River) that was severely damaged by a runaway oil rig during Hurricane Katrina. The project included demolition, civil design, landfill disposal of debris materials, site layout, safety issues, and product containment.

Publications/Papers Presented

- Haywick, D.W., M. Eschette, and S.M. O'Hearn, 1995. Industry Participation in the Teaching of a University Course in Environmental Geology. Geological Society of America, New Orleans, Louisiana.
- Isphording W.G., S.M. O'Hearn, and M.E. Bundy, 1993. Limestone Weathering and the Chemical Evolution of Residual Soils in a Tropical Karst Terrain. Geological Society of America, Boston, Massachusetts.
- Bundy, M.E., W.G. Isphording, S.M. O'Hearn, and J.E. Kusion, 1992. The Formation of Residual Pedogenic Clays by Limestone Weathering. Geological Society of American, Cincinnati, Ohio.

Organizations

- Geological Society of America (GSA)
- Alabama Geological Society (AGS)
- Southwest Alabama Geology Society (SWAGS)
- Manufacture Alabama
- Partners for Environmental Progress (PEP)
- The Nature Conservancy

- Mobile Baykeeper

Selected Professional Training Courses

- Supervisory Training – Accident Prevention and Loss Control, 2009
- Leadership Coastal Alabama Graduate, 2004
- NEPA Section 4(f) Workshop, 2004
- NEPA, Project Development, and Transportation Decision Making, 2004
- Annual participation in the ADEM UST Assessment and Remediation conferences
- Implementing ARBCA Process, 2002
- Auburn Engineering "Geodesy for Engineers and Surveyors" 1999.
- Implementing ARBCA Process: An in-depth, hands-on Training Program, 1998.
- Auburn Engineering "Global Positioning Systems for Engineers and Surveyors", 1998.
- National Groundwater Association Short Course: "PC Applications in Risk Assessment, Remediation Modeling and GIS", 1998.
- The Princeton Course "Groundwater Pollution and Hydrology", 1997.
- Introduction to ArcView, 1997.
- Risk-based Corrective Action (RBCA) and Training for Consultants, 1996.
- Geographic Information Systems (GIS) and the Geosciences, 1995
- Hazard Assessment and Response Management, 1994 (OSHA "40-hr Training") and annual updates.

Community Service

- Rotary International
- American Cancer Society – Chili Cook-off
- Alabama Coastal Foundation



David L. Upton, P.E.

Senior Civil/Environmental Engineer

Assignment: Senior Engineer

Firm: Thompson Engineering

Years Experience: With This Firm: 20
With Other Firms: 19

Education: BS/1977/Biology (Chemistry minor)
BS/1984/Civil Engineering
University of South Alabama

Active Registration: Professional Engineer
Alabama #16898
Florida #40270
Georgia #20322
Mississippi #10456
Louisiana #29959
Texas #130150

Experience and Qualifications

Mr. Upton is a Senior Engineer responsible for project engineering and project management. His career spans over 39 years of experience in projects involving water, wastewater, landfills, computer modeling, master planning, wastewater treatment, potable water and sanitary sewer systems, stormwater, hazardous waste, environmental studies, and lead-based paint and asbestos abatement.

Mr. Upton has served as project manager and/or project engineer for a variety of industrial, municipal, and private civil engineering projects. His responsibilities have included budget and construction estimates, surveying, sampling, design and construction management, and plans and specifications preparation. He has worked extensively with Federal, state, and local agencies, such as the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, Federal Emergency Management Agency, and the Alabama Department of Environmental Management. He is also an Instructor for ADEM's Qualified Credentialed Inspector Program for Stormwater.

Project Experience

Wastewater Treatment

Chevron, Pascagoula, Miss, On-going – Prepared design calculations and assistance in evaluation of wastewater treatment facilities. Project includes evaluation of design life of facilities, particle deposition, filtration and development of process alternatives.

BASF/Hargrove Engineering, McIntosh, Al 2016 – Prepared 30% process design calculations for a new wastewater treatment Neutralization Basin. Project included the development and evaluation of process alternatives to handle incoming wastewater from multiple sources (including groundwater and stormwater) with extreme variance in pH values.

Delta Downs CAFO Treatment Facility, Vinton, La. 2014-15 – Prepared plans and specifications and provided construction services for the collection and treatment of process water from a concentrated animal feed lot (CAFO). Project consisted of the design and construction of drainage systems for the horse barns, settling basins, 8 pumping stations, various sized force mains, treatment/polishing basins and aeration systems.

Hunt Southland Refinery Company, Wastewater Treatment Facilities Plan, Sandersville, MS, 2012 – Prepared a study of the existing combined wastewater and storm water treatment facilities and made recommendations for additional facilities to accommodate future plant expansions. Recommendations included new dissolved air floatation facilities, oil-water separation facilities, activated sludge treatment facilities, polishing ponds, and storm water conveyance facilities.

U.S. Army Corps of Engineers, Mississippi Army Ammunition Plant – Stennis Space Center, Mississippi 2010 - Prepared Plans and specifications and process design calculations to upgrade an existing WWTP consisting of three package type plants of 0.02, 0.05 and 0.08 MGD. Project included new emergency power generator, UV disinfection, aeration facilities, and influent screens and structure. Plants were stripped or existing equipment and aeration facilities and new were provided.

Louisiana Army National Guard, Camp Minden WWTP, Minden, LA, 2009 – Conducted study and evaluation of the existing trickling filter system at the former Louisiana Army Ammunition Plant and made recommendations for conversion to a sequenced batch reactor system to accommodate a projected tripling of the serviced population and a tightening of

the discharge permit standards. New plant was designed for a 0.25 MGD capacity, with a capability to expand to 0.5 MGD.

Creek Indian Enterprises Development Authority, Poarch Creek Wastewater Treatment Facility, Atmore, AL, 2009 – Prepared wastewater treatment alternatives analysis, permits, and plans and specifications for a 0.5 MGD Sequencing Batch Reactor WWTP to serve the Poarch Band of Creek Indians and the Wind Creek Casino & Hotel. The project incorporates a 0.1 MGD reuse water sprayfield as well as stream discharge.

Mobile County, River Delta Marina Waste Water Treatment Plant (WWTP), Mobile County, AL, 2007 – Prepared plans and specifications to design a 0.012 MGD WWTP to serve a Marina and RV Park. Project also included a pressure sewer system. The system discharged through a pressurized outfall and diffuser to the Mobile River.

Beau Rivage Resorts, Inc., Fallen Oaks Golf Course WWTP, MS, 2006 – Prepared plans and specifications to design a 0.016 MGD WWTP to serve a resort golf course. The plant included an ultraviolet disinfection system and water is used as makeup water for the irrigation system.

Olin Chemical Co. Inc., Plant Domestic WWTP, McIntosh, Washington County, AL, 2004 – Prepared plans and specifications to design a 0.009 MGD WWTP to treat domestic waste at industrial facility. Plant was constructed of 316 Stainless Steel for all wetted components and 304 S.S for all non-wetted components. This was necessary due to the nature of the industrial facility.

Mississippi Military Department, Camp McCain WWTP, Grenada, MS, 2005 – Prepared plans and specifications to design a 0.125 MGD WWTP to serve the Mississippi National Guard at Camp McCain. The plant consisted of a lagoon system for treatment with an overland flow system for wastewater polishing. After polishing, wastewater is chlorinated and dechlorinated before final discharge. Also prepared an operations and maintenance guidance manual for the facility to assist operators.

Coastal Paper Co., Wastewater Disposal Sprayfield, Wiggins, MS, 2001 – Prepared Plans and specifications to design a 1.2-MGD industrial wastewater spray disposal field for the paper mill. The system consisted of two miles of force main, two pumping stations, a four acre holding pond, 60 acres of sprayfield and construction of pumping stations, force mains, and spray distribution system.

Arkansas Department of Parks and Tourism, WWTP, Millwood Lake, AK, 2004 – Prepared Plans and specifications to upgrade an existing WWTP by adding an equalization basin, adding flow measurement, reengineering the slow sand filtration system, dosing chamber and chlorination system.

Arkansas Department of Parks and Tourism, WWTP, Lake Catherine, AK, 2005 – Prepared Plans and specifications to upgrade an existing WWTP by adding an equalization basin and sludge storage basin, adding flow measurement, upgrading the existing rapid sand filtration system and chlorination system. Project also included a new sanitary sewer line.

Arkansas Department of Parks and Tourism, WWTP, Lake Degray, AK, 2006 – Prepared Plans and specifications to replace an existing WWTP with a new 0.12-MGD extended aeration facility with tertiary sand filters. Project also included new chlorine storage facilities, new sludge drying beds, new chlorine contact chamber and dechlorination facilities. Also, four pumping stations, including the plant pumping station, were replaced with new submersible stations.

Water Works and Sewer Board of the City of Jackson, Alabama, WWTP Upgrade, 2003 – Prepared study evaluating the operation and loadings of a municipal wastewater treatment facility and assisted with the design for the upgrade of the WWTP for the City of Jackson, Alabama.

Alabama National Guard, Pelham Range, AL, 2004 – Designed oil/water separator system for National Guard Maintenance Facility.

UOP, EQ Basin Pond Solids Removal System, 2006 - Prepared study of solids handling alternatives and provided costs for implementing selected alternative.

Wastewater Conveyance Systems

Olin Chemical Co. Inc., Sewer System Smoke Testing, McIntosh, Washington County, AL, 2004 – Performed smoke testing of existing sewer system to determine sources of infiltration and to recommend improvements.

Creek Indian Enterprises (CEI), Pump Station and Force Main, Atmore, AL, 2008 – Design of an 800 gpm pumping station and 21,000 L.F. of 12" force main to convey wastewater from the new resort facility to the wastewater treatment plant.



Anniston Army Depot, Pump Station and Force Main, Anniston, AL, 2009 – Design of an industrial waste pumping station and 15,000 L.F. of 2" HDPE and PVC force main to convey acidic wastewater from an arms repair facility to the Industrial Wastewater Plant for treatment.

Harrison County Utilities Authority, Biloxi, MS, 2015 – Designed and prepared plans and specifications for a new 200 gpm pumping station and 8" force main.

Board of Water and Sewer Commissioners, Wastewater Effluent Pumping Station, Mobile, AL, 2012 – Designed a 35 MGD wastewater effluent pumping station at Williams WWTP. Station consists of two 5,500 gpm pumps and three 12,150 gpm pumps (nominal capacity) to meet a variety of pumping conditions to convey treated effluent from the WWTP to the Mobile River.

Greenfield Multistate Trust, Mobile, AL 2012 – Designed, and prepared plans and specifications for the replacement of a 110 gpm pump and force main. Both pump and force main were designed for highly acidic waters and to prevent particle deposition in line.

Airbus FAL USA, Mobile, AL, 2014 – Prepared plans and specification for a 150 gpm pumping station serving the Airbus Facility at Mobile Aerospace (Brookley Field) in Mobile, Alabama.

Airbus FAL USA, Mobile, AL, 2014 to 2015 – Prepared plans and specifications for the installation of underground utilities to serve the Airbus Facility at Mobile Aerospace in Mobile, AL. Utilities included; high pressure air, hot and chilled water, potable water, fire water and sanitary sewers.

Harrison County Utilities Authority, Biloxi, MS, 2015 – Designed new pumping station and modified existing station. These stations share a 16" force main with a third pump station to convey wastewater.

Water Treatment Plants and Wells

Board of Water and Sewer Commissioners, E.M. Stickney WTP, 2015 to 2017 (In Construction) – Prepared the design of a pebble lime storage silo and slaker system for a 60 MGD water treatment facility. The system has a rated capacity of 4,000 pounds/hour.

Beau Rivage Resorts, Inc., Fallen Oaks Golf Course WTP, MS, 2014 and 2016 – Designed

replacement wells for two potable water wells (85 and 50 gpm). These wells replaced existing wells that had failed.

GP Cellulose, Evaluation of River Intake Alternatives, 2012 – Prepared study to evaluate various alternative to replace or supplement the existing 60 MGD river intake structure and pumping facilities. Alternative evaluated included relocation of the existing facilities, Ranney Wells, horizontally drilled wells, and groundwater supply wells.

Creek Indian Enterprises (CEI), Water Well Design, Atmore, AL, 2009 – Design of a 700 gpm water well, and water treatment system for domestic use.

Beau Rivage Resorts, Inc., Fallen Oaks Golf Course WTP, MS, 2007 – Investigated issues with existing potable wells in system. Determined that wells were not constructed to design specifications, and evaluated and implemented repairs to them.

Water Works and Sewer Board of the City of Jackson, AL, New Water Treatment Plant, 2005 – Assisted in the design and preparation of plans and specification for a water treatment plant in Jackson, Alabama.

Beau Rivage Resorts, Inc., Fallen Oaks Golf Course WTP, MS, 2004 – Designed prepared plans and specification and permitted irrigation make up water well (500 gpm), two domestic supply wells with treatment facilities (85 gpm each) and conveyance facilities.

Water Systems

Creek Indian Enterprises (CEI), Design of an Elevated Water Storage Tank and Water Line, Atmore, AL, 2009 – Assisted in design and construction administration of 11,000 LF of 12" water line.

Creek Indian Enterprises (CEI), Evaluation of Freemanville Water System, Atmore, AL, 2006 – Evaluated existing water system for potential acquisition. Project involved a cursory inventory of the system, estimates of the current value of the system, the cost to upgrade the system, estimates of the cost to construct an expansion of existing facilities to meet future needs of CIE, and a comparison of the engineering costs involved.

Creek Indian Enterprises (CEI), Design of an Elevated Water Storage Tank and Water Line, Atmore, AL, 2008 – Designed a 1.0 MG fluted



column elevated water storage tank and 2,000 LF of 12" water line.

Board of Water and Sewer Commissioners, Pinto Island Water Main, Mobile, AL, 2007 – Designed a 20" HDPE water line to be installed by horizontal directional boring under the Mobile River to serve the Pinto Island and Causeway area.

Hazardous Waste Treatment and Disposal

Alabama State Port Authority, Monitoring Well 8s Remediation, Mobile, AL, 2006 – Evaluated groundwater contamination at MW-8s and prepared plans and specifications for the remediation of the site. Also provided construction administration and on-site observation services during remediation.

Alabama Department of Transportation, RCRA Audits, 2004 – Conducted RCRA compliance audits for each of the transportation facilities for Divisions 1, 2, and 7 of the Alabama Department of Transportation. Audits involved site visits to each district office in each Division and creating inventories of possible RCRA issues at each site. Recommendations to address problems found were made.

Ciba Chemical Company, McIntosh, Washington County, AL, 2008 – Assisted in remediation concept development for Superfund site. After concept was accepted by EPA, designed the placement of a 9" to 12" sand cap over 40 acres to isolate DDT contaminated soils. Cap was designed to be placed so as to minimize habitat destruction and involved hand, machine and pneumatic placement techniques.

Civil and Environmental Design and Studies

Mobile County Public School System, Close, Remove and Replace Underground Fuel Storage Tanks, 2018 to 2019 - Prepared plans and specifications to remove three underground storage tanks at the MCPSS Transportation Office facility and replace them with two above ground double wall fuel storage tanks and replace associated piping.

Utilities Services, Consent Decree Assistance, Ocean Springs, MS 2014 to 2017 (ongoing) – Prepared various plans and studies required by EPA consent order concerning 17 wastewater treatment facilities located in Mississippi. These studies include Sanitary Sewer Overflow Response Plans, Emergency Operations Plans, Preventative Maintenance Plans, Pump Station Operations and Maintenance Plans, Fats, Oils & Grease Management Programs, etc. Additionally, the

WWTPs were evaluated, deficiencies were noted and renovations were recommended.

Jackson County Utility Authority, Pretreatment Program Development, Pascagoula, MS, 2013 to 2016 – Assisted JCUA staff to develop local pretreatment ordinance, coordinate with Board Members and conduct public outreach to Board customers. This program also included the development of pretreatment discharge limits, standard operation procedures, WWTP databases and evaluations, etc. for implementation of a Wastewater Pretreatment Program.

Jackson County Utility Authority, Toxicity Reduction Evaluation Program Development, Pascagoula, MS, 2013 – 2016 – Developed toxicity reduction program for JCUA for their wastewater treatment facilities. Program included development of a TRE template or guidance document to assist in the response to a failure of Wastewater Effluent Toxicity (WET) testing at a treatment facility. This effort included the development of Process Flow Charts for Wastewater Treatment Facility performance and operations evaluations. This evaluation included common process toxicants, plant treatment processes, in-plant sources of toxicity, treatability studies and toxicity control selection.

Alabama National Guard, Fort McClellan Training Center, Anniston, AL, 2015 to 2016 – Developed Master Plan for evaluation of utilities to support future development at Fort McClellan. The plan considered future and existing population projections, future training needs, condition of existing water, gas, electrical, sewer and communications at the facility.

Mobile Transit Authority, New Above Ground Tanks, Fueling, Parking Area and Bus Wash Facilities, Mobile, AL, 1999 – Prepared plans and specifications to remove three underground fuel storage tanks at the MTA maintenance facility and replace them with two above ground double wall fuel storage tanks. During the project approximately two acres of concrete pavement was removed and replaced and the existing fueling area and bus wash was replaced with new facilities.

Alabama Department of Conservation and Natural Resources, Gulf State Park, AL, 1999 – Prepared plans and specifications for the closure of two underground fuel storage tanks and replacement with double wall aboveground tanks. Also replaced the fuel dispensing equipment and fuel management system.



GeoNet, Inc., Cellular Tower Sites, 2002 – Designed and prepared plans and specifications for the construction of new cellular telephone towers in Alabama, Mississippi, Louisiana and Florida. Approximately 180 towers were included in the project. Project included permitting, geotechnical, foundation design, surveys, Phase I environmental surveys, mitigation of impacts and construction assistance.

Olin Chemical Co. Inc., Brine Pond Alternative Analysis, McIntosh, Washington county, AL, 2004 – Evaluate the feasibility of removal and disposal of solids from the brine ponds at the Olin Chemical Facility in McIntosh, Alabama.

Beau Rivage Resorts, Hurricane Katrina Assistance, Biloxi, MS, 2006 – Removed and replaced underground fuel storage tanks damaged during hurricane. Also involved routing of new lines, fuel management systems, electrical, etc.

Alabama State Port Authority, Wetland Mitigation, Mobile, AL, 2007 – Designed and prepared plans and specifications for the construction of approximately 37 acres of wetlands at McDuffie Island and North Garrows Bend to replace those lost during the construction of a new port facility in Mobile, Alabama.

Alabama State Port Authority, Wetland Mitigation, Mobile, AL, 2008 – Designed and prepared plans and specifications for the construction of approximately 25.9 acres of wetlands at Arlington Point to replace those lost during the construction of a new port facility in Mobile, Alabama.

Stormwater Design

Ruby Tuesday, Stormwater and Wastewater Management, Navarre Beach, Florida, 2003 – Prepared Plans and specifications for the construction of an underground storage and disposal system for stormwater in Navarre Beach, Florida. Plans also include wastewater pumping station for the restaurant.

UPS, Stormwater Management, Fort Walton Beach, Florida, 2004 – Prepared Plans and specifications for the construction of a parking lot expansion storage and disposal system for stormwater in Panama City, Florida.

Browning Ferris Industries, Oil/Water Separator, Mobile, AL, 1999 – Designed oil/water separator system to remove contaminants from stormwater runoff from parking lot.

Board of County Commissioners, Escambia County Florida; Maintenance Rehabilitation Improvements to Drainage Ponds, Mariner Oaks Subdivision, 2006 – Redesigned and enlarged existing drainage ponds to meet current standards. Also redesigned side flow French drain system to increase capacity.

Stormwater Design and Pollution Prevention

Have prepared and certified NPDES permit applications and erosion-control BMP plans for numerous construction/land disturbance projects. Responsibilities have included compliance inspections, monitoring, and permit-required report preparation for the following projects:

Cooper Marine and Timberlands, EPA Stormwater Compliance, Various Locations, 2016 - On-Going – Project Engineer for evaluation of Clients environmental compliance which consisted of stormwater permitting and SPCC issues.

Alabama State Port Authority, EPA Stormwater Compliance, Mobile, AL, 2010 – Project Engineer for ensuring compliance with the Port's NPDES Stormwater Permits. Thompson Engineering reviewed existing documents and provided civil engineering, environmental consulting, and surveys to locate inlets, drainage, and outfalls; verified boundaries/operational limits and tenant locations; determined drain paths, possible pollution sources and impacts; permitting; BMP and SPCC plans revisions; and facility diagram updates.

Alabama Department of Transportation, Stormwater Pollution Prevention, 2003 to Present.

Hemphill Construction, Morgan-Regional Reclaimed Water System, 2003

Austal USA, Stormwater Pollution Prevention, 2004

Retirement Services of Alabama, Mobile Landing, 2004

Retirement Services of Alabama, RSA Tower and Battle House, 2004

The Winter Construction Company, Alabama Wood Treating Corp. Site Remediation, 2004

Dennis Wilkins, Heaven's Gate Residence, 2008



Phillips & Jordan, Inc., ASPA Stormwater Consulting, 2006

Cypress Equities, Spanish Fort, AL, Ongoing

Spill Prevention and Contingency Plans

Prepared spill plans for oil storage facilities, including engineering measures for the prevention of spills and control of spills if they should occur for many projects. The following are examples:

Aker Solutions, Inc., Spill Prevention Plans, 2014 and 2019 – Prepared SPCC for Mobile Site and updated plan after major expansion.

Cooper Marine and Timberlands, Spill Prevention Plans, 2016 to present - Prepared SPCC's for various sites in Alabama and Mississippi.

Alabama State Port Authority, Spill Prevention Plans, 2004 – Prepared SPCC's for the Bulk Materials Handling Plant and McDuffie Island Coal Handling Facility.

Alabama Department of Transportation, Spill Plans, 2006 – Prepared SPCC's for Divisions 1, 2 and 7.

Waste Management, Okaloosa Transfer Station SPCC, 2005

L-3 Corporation, Selma, AL, 2006

AAA Cooper Transportation, Theodore, AL, 2015

Aker Umbilicals, Inc., Mobile, AL 2016

UNUM, Chattanooga, TN, 2016

Previous Employment Experience

Stormwater Design and Pollution Prevention

Stormwater design has included design of culverts, storm sewers and other drainage structures. This also includes innovative underground stormwater retention structures in areas due to site restrictions.

Prepared detailed plans and specifications for the construction of stormwater facilities for municipal and industrial clients.

Prepared a study evaluating the capacity of stormwater facilities during the construction of a water

treatment facility for the Board of Water and Sewer Commissioners of the City of Mobile, Alabama.

Master Planning

Prepared 201 facilities plans, which included environmental inventories, preliminary design of wastewater treatment and transport facilities, alternative cost effective analysis and future planning for community waste and wastewater disposal needs.

Prepared water distribution system master plans. These plans included a computer analysis of the water distribution systems and transmission lines.

Developed master plans to provide sanitary sewer service and wastewater treatment. Plans involved treatment and disposal of wastewater from both industrial and domestic sources. Alternatives included the evaluation of a wetland treatment system for effluent polishing.

Water Treatment Plants and Wells

Designed and prepared plans and specifications for new water treatment plants.

Designed and prepared plans and specification for expansion and modification of existing water treatment plants.

Evaluated alternative water treatment plant designs.

Performed process design for water treatment plants.

Designed and prepared plans and specification for new water wells.

Designed and prepared plans and specifications for modification and restoration of capacity for existing water wells.

Evaluated chemicals for iron, copper and lead corrosion control in water distribution systems.

Prepared design and specifications for alternative disinfection systems.

Water Distribution Systems

Designed and prepared plans and specifications for water distribution system improvements and expansions. System designs include water mains, booster stations, etc.

Designed and prepared plans and specifications for elevated water storage tanks.



Designed and prepared plans and specifications for ground level water storage tanks.

Designed and prepared plans and specifications for booster pumps systems and supplemental disinfection.

Wastewater Treatment

Designed and prepared plans and specifications for new municipal and industrial wastewater treatment facilities. The types of plants designed included activated sludge, trickling filters, lagoons (aerated and facultative), extended aeration, sequencing batch reactors, and polishing systems such as wetlands.

Designed and prepared plans and specifications for upgrading and expansion of wastewater treatment plants. Projects included new equalization basins, flow-monitoring facilities, clarification improvements, chlorination/disinfection equipment, renovation of rapid sand filters and renovation of slow sand filters.

Wastewater disposal options designed and or evaluated have included conventional stream discharge, spray fields, overland flow, and wetlands.

Performed process design for wastewater treatment plants.

Prepared wastewater treatment process operation guidance manuals for both trickling filter and activated sludge treatment facilities.

Assisted operations personnel in optimizing wastewater treatment facility operations.

Designed and operated pilot water and wastewater treatment plants to determine ability of an alternative to remove pollutants in a particular water or waste stream.

Wastewater Conveyance Systems

Designed gravity and pressure sewer systems. Design included pumping stations, depressed sewers, and highway and stream crossings.

Pretreatment Programs – Conducted industrial waste surveys to determine the types and volumes of pollutants in a sewer system; investigated and evaluated the wastewater influent and effluent and determined the treatability of pollutants found. Also, evaluated sewer use ordinances and made recommendations.

Infiltration / Inflow Studies – Prepared I/I studies of wastewater conveyance systems. Projects included system surveys and inventories, flow measurement and computer modeling of systems.

Sewer System Evaluation Surveys (SSES) – Prepared plans and specifications for various sewer system rehabilitation. Work included evaluation of field survey of system condition, flow projections, cost effective analysis and determination of most effective method of sewer system repair.

Landfills

Developed design, plan of operation, and closure plans for landfills. Plans and specifications included construction of final clay cap, gas venting system, topsoil, grading and drainage.

Prepared studies for location of landfills, including preliminary site evaluation, development costs, transportation costs, and operations and maintenance costs.

Civil and Environmental Design and Studies

Prepared sampling program protocol and coordinated ongoing sampling efforts for wastewater treatment facility's discharge monitoring zone. This program was developed to determine the effects of their discharge on aquatic organisms as mandated in their NPDES permit.

Hazardous Waste Treatment and Disposal

Assisted in facility evaluation for an environmental audit for a large aircraft-refurbishing facility, including an evaluation of the hazardous waste facilities, wastewater facilities, and air quality controls.

Designed and prepared plans and specifications for the reclamation of a lead-contaminated dredge disposal site. Project consisted of stabilization of lead in soils, regrading of site, and containment dikes, consolidation of soils for construction of industrial warehouse and office buildings, and construction of a 55-acre wetland for site stormwater control.

Designed improvements to and operated a pump and treat system for a chemical warehouse contaminated from past spill events.

Designed final cap and closure for pesticide-contaminated site for a forest products company.



Preliminary design and alternative development for a stormwater containment and evaporation basin for a waste recycle plant.

Defined hazardous waste impoundment and designed sampling program to determine the limits of solid impoundment. Performed groundwater monitoring and assisted in closure of the impoundment under EPA guidelines.

Participated in the evaluation of hazardous waste cleanup, including the evaluation of sample results.

Designed groundwater monitoring plan for municipal wastewater spray field.

Designed hazardous waste storage policy and preliminary design on storage facilities for an organic chemical company.

Participated in remedial investigation/feasibility study for Superfund site and reviewed safety procedures for the site. Also, involved in construction surveillance for construction of containment wall for landfill closure at the site.

Designed and certified closure of a hazardous waste storage facility at an industrial plant.

Designed and supervised programs for testing of lead-based paint in public housing. Also, prepared report of findings for the lead-based paint testing program.

Prepared plans and specifications for removal and disposal of lead-based paints from both elevated and groundwater storage tanks for municipalities in Alabama, Georgia, Florida, and Mississippi. The tanks were repainted with non-lead-containing paints.

Completed required courses and examination to become certified as an Inspector/ Management Planner and a Project Designer under the Asbestos Hazard Emergency Response Act (AHERA). Qualified to perform building inspections and assessments and to develop long-range plans for the management and control of asbestos-containing materials found in buildings. Also, was accepted by the U.S. EPA as an instructor for these courses.

Conducted more than 200 asbestos projects in the public and private sectors in which survey, sampling, design of plans and specifications, air monitoring and construction surveillance services were provided.

Litigation Experience

- Mexia vs. Norden Construction
- Ham vs. Chickasaw
- Montgomery vs. Saraland
- Sara Thornton vs. Bayou Bend Apts

Continuing Education / Training

- Sediment and Erosion Control & Stormwater Management
- Designing for Effective Sediment & Erosion Control on Construction Sites
- Storm Water Quality Enhancement
- Hazardous Waste Operations & Emergency Response
- Sequencing Batch Reactor Process and Product Application
- Wetland Primer for Design Professionals
- Traffic Engineering Operations
- OSHA 10-hour Construction Safety
- Advanced Compugraphics Softdesk/AutoCAD Training
- EPA's Waste Minimization Guidance & LDR's for Ignitable and Characteristic Wastes
- EPA's Multi-Media Compliance Audit Procedures
- Advanced Network Modeling
- Computer Analysis of Pressure and Flow in Piping Systems
- Environmental Management Decisions
- Environmental Analysis
- RCRA Review
- Clean Water Act Review
- Lead-Based Paint Abatement
- Respiratory Protection Program
- Practices and Procedures for Asbestos Control
- Hazardous Waste CE750
- Asbestos Inspector/Management Planner's Course and Asbestos Project Designer's Course
- NIOSH 582, Sampling and Evaluating Airborne Asbestos Dust
- Glove-Bag Workshop

Professional Affiliations

- American Society of Civil Engineers
- National Society of Professional Engineers, Past President
- American Water Works Association



Community Service

- Member Codes Advisory Committee, City of Mobile, Alabama

- Member St. Dominic Church
- Head of Lectors, Member of Liturgy Committee, Member of Choir
- Member Gloria Dei Chorale



Melissa M. Montgomery, P.G.

Environmental Scientist / Project Manager

Assignment: Environmental Scientist
Firm: Thompson Engineering
Years' Experience: With This Firm: 14
Education: BS/2004/Geology
University of South Alabama
Registration: Professional Geologist:
AL No. 1314
ADEM Qualified Credential
Inspector (QCI), #T-0643

- Corrective Action Effectiveness (CAE) Reports
- Construction Best Management Practices Plans (CBMPPs)
- Storm Water Pollution Prevention Plans (SWPPPs)
- Statistical Analysis Reports
- Sampling and Analysis Plans (SAP)
- Dredged Material Evaluation Reports
- Sediment Characterization Reports

Experience and Qualifications

Mrs. Montgomery serves as Project Manager and Lead Environmental Scientist for the majority of Underground Storage Tank (UST) Trust Fund work performed by Thompson. She oversees aggressive soil and groundwater remediation projects including use of mobile enhanced multi-phase extraction (MEME) events, ozone sparging, chemical injections, and dual phase extraction technology.

Her project experience has included:

- Soil and groundwater assessments and sampling
- Groundwater elevation monitoring
- Electromagnetic (EM) surveys
- Risk Based Assessments using Alabama Risk-Based Corrective Action (ARBCA) computational software.
- Statistical analysis using ChemSTAT
- Computer mapping using CAD, Surfer, and GIS software.
- Monitor well installation, development, monitoring, and abandonment
- Permitting
- Underground Storage Tank (UST) closures
- Indoor and outdoor air quality sampling
- Turbidity monitoring

Development of project reports and plans has included:

- Phase II Reports
- Preliminary and Secondary Reports
- Groundwater Monitoring Reports
- Site-specific Risk Based Corrective Action calculations and reports
- Corrective Action Plans (CAP)
- Corrective Action Implementation (CAI) Reports

As Project Manager, Mrs. Montgomery is responsible for project coordination including remediation operations, field sampling activities, analytical testing, reporting, etc.

Project Experience

Soil and Groundwater Assessments / Remediation

Nick's Conoco, ADEM UST Soil and Groundwater Remediation, Prichard, AL, Ongoing –Project Manager / Lead Environmental Scientist for multiple UST soil and groundwater remediation projects at an active retail gas station. Responsibilities since 2007 have included supervision of monitor well installations and free product recovery activities, performing/coordinating soil and groundwater sampling, analysis of data for remediation recommendations, writing Preliminary, Secondary, and Groundwater Monitoring Reports including GIS and CAD mapping, completing Alabama Risk Based Corrective Action Assessment (ARBCA) and CAPs, NPDES and air permitting, coordinating the installation of a dual phase extraction system, and completing the dual phase system CAI Report. Currently coordinating the bi-weekly operations and maintenance inspections of the dual phase system and the quarterly groundwater sampling events and writing quarterly dual phase CAE Reports including GIS and CAD drafting, etc.

Carter Oil Company, ADEM UST Soil and Groundwater Remediation, Sheffield, AL, Ongoing – Project Manager / Lead Environmental Scientist for multiple UST soil and groundwater remediation projects at a petroleum bulk storage and fueling facility. Responsibilities since 2010 have included coordination of monitor well installations and free product recovery activities, coordinating soil and groundwater sampling, analysis of data for



remediation recommendations, writing Preliminary, Secondary, and Groundwater Monitoring Reports including GIS and CAD mapping, completing an ARBCA and CAPs, air and underground injection control permitting, coordinating the installation of an ozone sparging system, completing the ozone system CAI Report, reviewing bi-weekly operations and maintenance inspections of ozone sparging system, writing quarterly ozone CAE Reports including GIS and CAD drafting, etc. Currently coordinating chemical injection activities.

Continental Motors, Soil and Groundwater Remediation of Cyanide, Mobile, AL, Ongoing – Lead Environmental Scientist for soil and groundwater remediation at an active production plant. Responsibilities since 2009 have included supervision of monitor well installations, performing soil and groundwater sampling, overseeing chemical injection activities, analysis of data for remediation recommendations, writing Groundwater Monitoring, CAI, and CME Reports including GIS and CAD mapping. Currently coordinating semi-annual groundwater monitoring activities.

Alabama Department of Transportation, CR-208 Bridge and Approaches, Groundwater Monitoring, Chambers County, AL, Ongoing – Serves as Lead Environmental Scientist for multiple UST groundwater remediation projects at the site. Responsibilities since 2005 have included supervision of monitor well installation and MEME events, performing soil and groundwater sampling, analysis of data for remediation recommendations, writing Preliminary, Secondary, and Groundwater Monitoring Reports including GIS and CAD drafting, completing an ARBCA and CAPs, air permitting, etc. Groundwater sampling of the monitor wells will continue through the end of the year.

Rouse Properties, Shoppes of Bel Air Renovations, Mobile, AL, Ongoing – Project Manager for soil excavation and removal, groundwater sampling and monitoring, pre-demolition hazardous materials surveys (limited asbestos and lead-based paint), demolition plans and specifications, and reporting for the former standalone single story Sears Automotive Center. Pre-renovation hazardous materials surveys were also performed for retail spaces in the main mall that previously housed Sears, Champs, and Lady Foot Locker. Air monitoring was performed during remediation.

Alabama Department of Transportation, I-10 River Bridge Preliminary Investigation, Mobile County, AL, Ongoing – Environmental Scientist for

performing a hazardous materials preliminary investigation for the proposed I-10 Mobile River Bridge at ten properties located within the proposed bridge and/or right-of-way project limits. The project involved performing borings, soil and groundwater sampling, temporary well installation, chemical testing, and reporting. In addition, Ms. Montgomery has worked on the following projects for ALDOT performing soil and groundwater assessments and remediation.

- U.S. Highway 72 Interchange Project, Madison County, AL
- SR-35 Widening Project, Jackson County, AL
- SR-181 Widening Project, Baldwin County, AL
- CR-83 Widening Project, Baldwin County, AL
- SR-13 Interchange Project, Washington County, AL

Celanese Limited, Groundwater Monitoring, Bucks, AL, Ongoing – Performs bi-annual ADEM required groundwater monitor well sampling events. Responsible for collecting groundwater samples, measuring groundwater depth levels, CAD design, and report writing.

Greenfield Environmental Multistate Trust, LLC (formerly Tronox and Kerr McGee), Groundwater Elevation Monitoring, Mobile, AL, Ongoing – Evaluates bi-weekly groundwater level readings for groundwater elevations and flow direction for on-site French drain effectiveness. Also responsible for semi-annual and annual groundwater monitoring reports and annual statistical analysis report which includes chemical evaluation, CAD design, and report writing.

Eddie's Chevron, Groundwater Monitoring, Government Street, Mobile, AL, Ongoing – Performs ADEM required quarterly groundwater monitoring activities and oversees MEME events. Responsible for coordinating quarterly groundwater sampling events, CAD design, report writing. Also has performed an Alabama risk based corrective action evaluation.

Midway Materials Inc., Construction/Demolition Landfill Hydrogeological Study, Mobile, AL, Ongoing – Performs bi-annual groundwater monitor well sampling events. Responsible for collecting groundwater samples, measuring groundwater depth levels, CAD design, and report writing.



City of Mobile, Proposed Fire Station Site, Phase II Environmental Site Assessment, Mobile County, AL, 2016 – Project Manager for a Phase II Environmental Site Assessment (ESA) at a proposed fire station site to further evaluate recognized environmental conditions (RECs) referenced in the Phase I ESA. The Phase I revealed RECs in connection with four properties in the vicinity. The project involved shallow soils and groundwater conditions assessment, soil and groundwater sampling using direct push drilling technology, temporary wells/piezometer installation, chemical analyses, and reporting.

Former Grub Mart #29, Groundwater Monitoring, Pepperell Parkway, Opelika, AL, 2013 – Project Scientist for preliminary and secondary investigations. Responsible for an Alabama Risk Based Corrective Action (ARBCA) evaluation, CAD design, oversight of groundwater sampling of the monitoring wells and mobile enhanced multi-phase extraction (MEME) events, and development of multiple reports over a four year period.

E & IH Services, Technip USA, Subsurface Sample Collection, Mobile, AL, 2008 – Responsibilities included collecting composite soil samples, supervising groundwater monitor well installation, collecting groundwater samples, and abandoning temporary monitor wells.

Tecnico Corporation, Proposed Tecnico Site Subsurface Investigation, Chickasaw, AL, 2008 – Performed a subsurface investigation. Responsibilities included collecting composite soil samples, supervising groundwater monitor well installation, collecting groundwater samples, abandoning temporary monitor wells, CAD design, and report writing.

Hatch Mott MacDonald, Proposed Commercial Site Phase II, Gulf Shores, AL, 2008 – Performed a Phase II investigation. Responsibilities included collecting composite soil samples, supervising groundwater monitor well installation, collecting groundwater samples, abandoning temporary monitor wells, CAD design, and report writing.

Alabama State Port Authority, Choctaw Point Phase II, Mobile, AL, 2007 – Performed a Phase II investigation. Responsibilities included collecting composite soil samples, supervising groundwater monitor well installation, collecting groundwater samples, abandoning temporary monitor wells, CAD design, and report writing of the Limited Phase II and Additional Phase II reports.

Mitsubishi Polycrystalline Silicon, Groundwater Monitoring, Theodore, AL, 2007 – Performed annual groundwater monitoring events. Groundwater monitoring included collecting groundwater samples via a peristaltic pump, chemical evaluation, CAD design, and report writing.

Kimley Horn, Proposed Wal-Mart Phase II, Mobile, AL, 2007 – Performed a Limited Phase II investigation and an additional Phase II investigation surrounding a UST. Responsibilities included collecting composite soil samples, supervising groundwater monitor well installation, collecting groundwater samples, abandoning temporary monitor wells, CAD design, and report writing of the Limited Phase II and Additional Phase II reports.

Advanced Disposal, Proposed Landfill Site, Washington County, AL 2007 – Performed a landfill site assessment. Responsibilities included collecting and visually classifying soil samples, supervising temporary monitor well installation, performing water level monitoring every 15 days, CAD design, and report writing.

Mississippi Army National Guard, Camp Shelby Sediment Assessment, South of Hattiesburg, MS, 2005 – Performed a geomorphic assessment in the field and drafted sediment depth locations in GIS.

Beau Rivage, Golf Course, Groundwater Elevation Monitoring, Highway 15, North Biloxi, MS, 2004 – Performed groundwater flow direction and groundwater elevation investigation. Responsibilities included monitoring weekly water levels within temporary piezometers and drafting AutoCAD cross-sections.

School District of Escambia County, Downtown Elementary School Environmental Sampling, Pensacola, FL, 2013 – Environmental Scientist for the Phase II Environmental Site Assessment (ESA) at a 12-acre site for a new elementary school. Responsibilities included collecting composite soil samples, supervising groundwater monitor well installation, collecting groundwater samples, abandoning temporary monitor wells and writing a Phase II ESA report including GIS and CAD mapping.

Mobile Infirmary Medical, Groundwater Monitoring, Mobile Infirmary Circle, Mobile, AL, 2012 – Performed ADEM required groundwater activities, collected groundwater samples, oversaw



MEME events, CAD design, and developed reports. No further action required from ADEM following remediation performed using surfactant injection.

Former Delchamps Warehouse, Groundwater Monitoring, Western Drive, Mobile, AL, 2012 – Performed ADEM required groundwater activities, collected groundwater samples, oversaw MEME events, CAD design, and developed reports.

Storage Tank Management

Mobile County Public School System,

Mobile County Public School System, Continuous Learning Center, Underground Storage Tank (UST) Closure, Mobile, AL, 2016 – Performed UST closure activities. Responsibilities included supervising the tank removals, collecting soil samples from the tank pits and stockpiles, CAD design, and report writing of the ADEM UST Closure Site Assessment Report.

Chinnis Holdings L.L.C., Former Papa John's UST Closure, Mobile, AL 2008 – Performed UST closure activities. Responsibilities included supervising the tank removal, collecting soil samples from the tank pit, CAD design, and report writing of the Alabama Department of Environmental Management UST closure site assessment.

Beau Rivage, UST Closure and Replacement, Biloxi, MS, 2006 – Performed UST closure and replacement activities. Responsibilities included supervising UST removal and collecting soil samples.

Holiday Isle, LLC, UST Closure Assessment, Dauphin Island, AL 2005 – Performed UST closure activities. Responsibilities included supervising the tank removals, collecting soil samples from the tank pits and stockpiles, supervising temporary groundwater monitor well installations, collecting groundwater monitor well samples, performing temporary monitor well abandonment, CAD design, and report writing of the ADEM UST Closure Site Assessment Report.

Coastal / Stream Restoration

Alabama Dept. of Conservation and Natural Resources (ADCNR), Marsh Island Restoration, Portersville Bay, Mississippi Sound, Ongoing – Environmental Scientist for the restoration of salt marsh and provide shoreline protection at Marsh

Island in the Mississippi Sound. The Island had been experiencing 5-10 ft. of shoreline loss per year. The project included the placement of 3,500-ft. of OysterBreak™ structures to stabilize the shoreline of the existing 20-acres and the creation of an additional 50-acres of marsh. The project also included permitting, hydrologic modeling, tidal creeks, borrow source investigation and placement of dredged material for fill, and planting native marsh vegetation. Ms. Montgomery was responsible for off-shore and on-shore sediment characterization at four alternative borrow sites for fill material for the creation of the marsh.

Mobile Bay National Estuary Program (MBNEP), Mon Louis Island Shoreline Stabilization, Mobile County, AL, Ongoing – Environmental Scientist for the creation of an additional 4-acres of marsh to restore the island and to enhance/create aquatic, wetland, and upland habitats. The project also involved dredging the Fowl River Federal Navigation Channel, installation of a rubble mound breakwater to stabilize the shoreline, and the evaluation of borrow material for fill. The project involved subsurface investigations, permitting, alternatives evaluation (living shoreline, marsh configuration, etc.), engineering design, and construction inspection. Ms. Montgomery was responsible for on-shore soil characterization for fill material for the creation of the marsh.

City of Fairhope, Fly Creek Restoration Evaluation, Fairhope, AL, 2014 – Environmental Scientist for the Fly Creek restoration evaluation to identify measures to restore natural resources in the coastal stream and its associated watershed. The watershed that feeds Fly Creek is 5,018-acres. The areas of restoration focused on degraded streams and wetlands, stormwater management, land use practices, preservation of natural areas and open space, and the creation of riparian buffer. Ms. Montgomery was responsible for reporting on the groundwater hydrology, geologic formations, and the soil characteristics within the watershed.

Mobile Bay National Estuary Program, D'Olive Bay Comprehensive Watershed Management Plan, Daphne and Spanish Fort, AL, 2010 – Environmental Scientist for a Comprehensive Watershed Management Plan for D'Olive Bay Watershed that encompasses a 14-square mile area. The project involved watershed characterization, wetland assessment, data compilation and evaluation, restoration and mitigation alternatives, stream geomorphological and erosion activity assessment, conceptual



engineering, cost estimating, strategic financing alternatives, and community outreach. Ms. Montgomery was responsible for the reporting of geologic formations within the watershed and providing assistance with the GIS mapping.

Dredging / Dredge Material Evaluation

Plains Marketing, Maintenance Dredging, Mobile, AL, Ongoing – Environmental Scientist for routine dredging maintenance that involves contract dredging, sediment characterization, dredge plans and specifications, permitting, dredge disposal coordination, hydrographic survey, certification of removed volume, and construction inspection. The area encompasses three acres and is in the vicinity of the Plains bulk loading dock along the Mobile River. Dredging is performed to a depth of -44 MLLW and dredge materials are disposed of in a Dredge Material Management Area (DMMA). As part of the scope, material must be removed from the DMMA for off-site disposal. Ms. Montgomery develops a sampling analysis plan for chemical analysis of dredge materials, oversees vibracore sampling in the Mobile River, and develops the characterization report using analytical results for approval to dispose of in the DMMA.

City of Pass Christian Harbor Expansion, Pass Christian, MS – Environmental Scientist for a 20-acre harbor basin. The project involved development of an environmental permit application and dredging as well as design and construction of berths and breakwater protection. Ms. Montgomery developed a sampling analysis plan for chemical and bioaccumulation analyses of dredge materials, oversaw vibracore sampling in the Mississippi Sound, and developed the characterization report using analytical and bioaccumulation results.

Asbestos, Lead Paint, Hazardous Materials

Alabama Department of Transportation, Subsurface Investigation, Pride Express, Robertsdale, AL, 2007 – Performed a preliminary investigation. Responsibilities included visual classification and collection of soil samples to test for specific contaminants, CAD design, and report writing.

UOP, Roof Abatement, Chickasaw, AL 2006 – Performed weekly indoor and outdoor air quality tests specifically testing for asbestos during roof

abatement. Responsibilities included air sampling pump set-up and removal and writing weekly observation and sampling result reports.

Pollution Prevention Plans

Alabama State Port Authority, EPA Stormwater Compliance, Mobile, AL, 2010 – Environmental Scientist for ensuring compliance with the Port's NPDES Stormwater Permits. Thompson Engineering reviewed existing documents and provided civil engineering, environmental consulting, and surveys to locate inlets, drainage, and outfalls; verified boundaries/operational limits and tenant locations; determined drain paths, possible pollution sources and impacts; permitting; BMP and SPCC plans revisions; and facility diagram updates.

Selected Professional Training

- Risk Based Corrective Action (RBCA)
- 10 Hour OSHA
- Erosion/Sediment Control and Storm Water Management
- 40 Hour OSHA Hazardous Waste Operations Training ID: HAZ400107
- 8 Hour OSHA Hazardous Waste Operations Refresher
- ABC Basic Plus Safety Training
- Transportation Worker Identification Credential (TWIC) Certification
- Alabama Stormwater Qualified Credential Inspector Training: #T-0643





Greenfield Environmental Multistate Trust LLC
Trustee of the Multistate Environmental Response Trust
Greenfield Environmental Trust Group, Inc., Member
7300 Rangeline Rd, Theodore, AL 36582
(443) 603-3712
dd@g-etg.com

Mr. C. B. Holden
Alabama Department of Environmental Management
Land Division – Solid Waste Branch
Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 274-4248



May 9, 2019

Subject: 10 Acre Industrial Landfill Permit No. 49-32

Dear Mr. Blake Holden

Greenfield Environmental Multistate Trust, LLC, not individually but solely in its capacity as Trustee of the Multistate Environmental Response Trust (the Multistate Trust) is providing additional details requested by the Alabama Department of Environmental Development (ADEM) for the completion of its 10 Acre Industrial Landfill Permit Renewal Application for the property situated at 7300 Rangeline Rd, Mobile, AL.

In reference to the company name on the permit, the Multistate Trust requests to change the name on the permit to reflect the current owner and party responsible for the property. The Multistate Trust has completed ADEM Form 330 with the requisite \$800 fee, both of which are attached.

As part of the renewal applications, the Multistate Trust also requests that all approved variances for the existing permit be maintained with the renewed permit.

Finally, we prepared a Standard Operating Procedure for the 10 Acre Landfill, which is attached for your review and comment. Upon final review, it will be incorporated with the renewed permit as Attachment A.



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Should you require any further details or wish to discuss the above information, please don't hesitate to contact me at any time.

Sincerely,

David B Dabney

Greenfield Environmental Multistate Trust LLC
Trustee of the Multistate Environmental Response Trust
By: Greenfield Environmental Trust Group, Inc., Member

Attachment(s): (Draft) Standard Operating Plan – 10 Acre Industrial Landfill
ADEM Form 330
ADEM Form 330 Fee – Permit Name Change = \$800.00

cc: Stephan A Cobb – ADEM
T Griffith – The Multistate Trust
C Brooks – The Multistate Trust



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Trustee of the Multistate Environmental Response Trust
Greenfield Environmental Trust Group, Inc., Member
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Attachment

**Standard Operating Procedures for
10-acre Industrial Landfill**

1.0 10 Acre Landfill

1.1 OVERVIEW

The owner of the 10-acre industrial landfill, the Greenfield Environmental Multistate Trust, will provide personnel and equipment to maintain the landfill. All work in the landfill, including routine maintenance, is performed during daylight hours only. All operators will log into and out of the landfill with the Radiation Safety Officer (RSO) or Health Physics Specialist (HPS), who are responsible for accounting for all landfill personnel.

The industrial landfill is located at the north end of the property, in between the 19-acre and 27-acre impoundments. It consists of a single large cell with storm-water diverted by surface drainage to the adjacent 27-acre pond to the west. Dewatering fluids from the original 10-acre Pond flow by strip drains and collection laterals to a sump located at the southeast corner of the landfill.

Routine disposal activities for the landfill are currently suspended. However, in the near future the Multistate Trust will initiate closure activities in the former facility area and disposal of IOX related waste will resume at that time. Prior to initiating disposal activities, this operations plan will be amended to include waste placement and management procedures.

The storm water contained within the landfill will gravity flow along the perimeter ditch and drain into the 27-acre iron oxide pond through storm water culverts located along the west dike. The storm water is drained to the 27-acre pond, from which effluent flows to the Mobile Facility Wastewater Treatment System. The fluids collected from the dewatering system in the sump southeast of the landfill will be pumped to the 27-acre pond.

SAFETY

All operators in the landfill will carry a plant radio. They will check in with RSO or HPS. All operators will check out with the RSO or HPS and be scanned when work in the landfill is completed. The RSO or HPS will account for all personnel on the landfill using a Radiation Work Permit (RWP), which will be maintained at all times for personnel in the landfill area. The RSO will keep all RWP records as required by the NARM Awareness Program (NAP).

All operators in the landfill must wear personal safety and protection equipment, which includes steel-toe boots, hard hat, safety glasses or side shields, bright

Standard Operating Plan

orange or yellow safety vest, and if deemed necessary, hearing protection, gloves, masks, or other safety equipment as appropriate.

Any equipment entering the landfill for maintenance work will be signed in by the RSO or HPS. Upon leaving the landfill, all equipment will be decontaminated on a specially constructed decontamination pad, scanned and signed out by the RSO or HPS.

1.2 STORM WATER RUNOFF

- 1.2.1 The storm water runoff gravity flows along the perimeter ditches to the 27-acre pond through culverts at the west dike of the 10-acre landfill.
- 1.2.2 Dewatering fluids from the original 10-acre Pond flow by strip drains and collection laterals to a sump located at the southeast corner of the landfill and pumped to the 27-acre pond
- 1.2.3 All storm water drained to the 27-acre pond, is pumped to the Mobile Facility Wastewater Treatment System for treatment and release according to the NPDES permit for the site.

Application for Name Change or Transfer of Permit or Exemption
Alabama Department of Environmental Management

Existing Facility: The facility, site or location with the current permit or registration.

Permit or Registration No. 49-32

Expiration Date: February 27, 2019 (Currently under renewal with ADEM)

County: Mobile

Facility Name: Multistate Environmental Response Trust - Mobile Facility

Address: 7300 Rangeline Rd.
Mobile, AL 36582

Telephone: 443-603-3712

Application for Name Change: An application for name change must be made by the current permittee or registrant. A name change does not change any condition of the permit or registration approval.

Responsible Official Making the Request to Change the Name of the Permittee or Registrant:

Name: David Dabney Title: Site Manager

Signature:  GREENFIELD ENVIRONMENTAL MULTISTATE TRUST, LLC
TRUSTEE OF THE MULTISTATE ENVIRONMENTAL RESPONSE TRUST

Address: 7300 Rangeline Rd.
Mobile, AL 36582

Telephone: 443-603-3712 Change of Mailing Address: _____

E-mail: dd@g-etg.com Date: May 9, 2019

Current Name: Tronox LLC - Mobile Facility 10 Acre Landfill

Proposed Name: Multistate Environmental Response Trust - Mobile Facility 10 Acre Landfill

Effective Date of Name Change: May 9, 2019

Person Requesting Transfer of Permit or Registration: An application to transfer must be made by the current permittee or registrant.

Name: _____ Title: _____

Signature: _____

Address: _____

Telephone: _____

E-mail: _____ Date: _____

Person Accepting Transfer of Permit or Registration: Transfer of a permit or registration does not change any condition of the permit or registration approval. By their signature below, the person accepting transfer of the permit or registration assumes all responsibility for the facility and agrees to abide by all permit or registration conditions.

Name: _____ Title: _____

Signature: _____

Address: _____

Telephone: _____ Change of Mailing Address: _____

E-mail: _____ Date: _____

Landowner: (Signature of the landowner(s) acknowledges that this application is being made and is required if the applicant is different from the landowner).

Name: _____ Title: _____

Signature: _____

Address: _____

Telephone: _____

Fees: Include the appropriate application fees with this form. Appropriate fees may be found in ADEM Admin. Code 335-1-6 available at:
adem.alabama.gov/LandDivision/ScrapTire/ScrapTireFeeSheet407.doc

7. Submittal: Submit this form and applicable fees to:

Alabama Department of Environmental Management
Waste Programs Branch
Scrap Tire Unit

P.O. Box 301463 (mailing address)
Montgomery, AL 36130-1463

1400 Coliseum Blvd. (physical address)
Montgomery, AL 36110-2059

An electronic version of this application may be submitted to ADEM at: TireMail@adem.alabama.gov. All attachments to this application must also be submitted in an electronic version.

For additional information, contact the ADEM Scrap Tire Unit at: 334-271-7988.

INSTRUCTIONS

Application for Name Change or Transfer of Permit or Exemption

Existing Facility.

Complete all items for the facility, site or location with the current permit or registration. This section must be completed for a name change or for a transfer of a permit or registration.

Application for Name Change.

Give the name, title and contact information for the person requesting to change the name of the permittee or registrant. The person requesting the name change must be a responsible corporate official, as defined in 335-4-1-.01. Complete all items for the current named facility, site or location and the new name of the facility, site or location. Check if the mailing address of the facility will change.

Person Requesting Transfer of Permit or Registration.

For a permit or registration to be transferred, the current holder must apply for the transfer. Give the name, title and contact information for the person requesting the transfer of the permit or registration. The person requesting the transfer must be a responsible corporate official, as defined in 335-4-1-.01.

Person Accepting Transfer of Permit or Registration.

Give the name, title and contact information for the person accepting the transfer of the permit or registration. The person accepting the transfer must be a responsible corporate official, as defined in 335-4-1-.01. Check if the mailing address of the facility will change.

Landowner.

The persons owning an interest in the land where a facility or site is located must acknowledge that the current permittee or registrant is seeking to change the name or transfer the permit or registration. Give the name, title and contact information for the person(s) owning an interest in the land.

Fees.

An application for name change or transfer will not be processed until applicable fees are paid. Fees are as shown in ADEM Admin. Code 335-1-6-.04(2) available at:
adem.alabama.gov/LandDivision/ScrapTire/ScrapTireFeeSheet407.doc

Submittal.

Submit the completed form and applicable fees to: Alabama Department of Environmental Management, Waste Programs Branch, Scrap Tire Unit; P.O. Box 301463 Montgomery, AL 36130-1463. An electronic version of this application may be submitted to ADEM at: TireMail@adem.alabama.gov. If submitting application electronically, all attachments to this application must also be submitted in an electronic version. Contact ADEM at: 334-271-7988 for additional information about this application form.

Regulations in ADEM Admin. Code 335 may be found on the ADEM web site at:
adem.alabama.gov/regulations/regulation.htm. Scrap tire regulations are in Division 4. Fee regulations are in Division 1, Chapter 6.