Mueller Property Holdings, LLC
Birmingham, Alabama
EPA I.D. Number ALD 004 017 901

FACT SHEET

A draft renewal of the Alabama Hazardous Waste Management and Minimization Act (AHWMMA) permit has been prepared for the Mueller Property Holdings, LLC facility. This hazardous waste facility is located in Birmingham, Alabama. This fact sheet has been prepared to briefly advise the public of the principal permitting, legal and policy issues of the draft permit.

I. PERMIT PROCESS

The purpose of the permitting process is to allow the State and the public to evaluate Mueller Property Holdings, LLC's ability to comply with the hazardous waste management requirements of the AHWMMA, as amended. Mueller Property Holdings, LLC must comply with hazardous waste management conditions set forth in the permit during the effective period of the permit, which is ten (10) years from the last permit renewal.

II. PROCEDURES FOR REACHING A FINAL DECISION

The Alabama Department of Environmental Management (ADEM or Department) is proposing to issue Mueller Property Holdings, LLC a permit for post-closure care for the Closed Landfill (SWMU 21) which has been closed as a single landfill unit with wastes and/or contaminated soils remaining in-place.

ADEM Admin. Code r. 335-14-8-.08(6)(b)1. requires that the public be given a 45-day comment period for each draft permit. The comment period will begin on August 14, 2019, which is the date of publication of the public notice in major local newspaper(s) of general circulation, and will end on September 30, 2019. The public notice will also be broadcast over local radio station(s).

Any person interested in commenting on the application or draft permit must do so within the 45-day comment period discussed above.

All persons wishing to comment on any of the permit conditions or the permit application should submit their comments in writing to the Alabama Department of Environmental Management, Permits and Services Division, 1400 Coliseum Blvd. (ZIP 36110-2059), P.O. Box 301463 (ZIP 36130-1463) Montgomery, Alabama, ATTENTION: Mr. Russell A. Kelly.

ADEM will consider all written comments received during the comment period while making a permit decision for this facility. When the Department makes its final permit decision, notice will be given to the applicant and each person who has submitted written comments or requested notice of the final permit decision.

III. FACILITY DESCRIPTION

Mueller Property Holdings, LLC has applied for a permit under the requirements of AHWMMA for post-closure care including corrective action for groundwater contamination. Mueller Property Holdings, LLC is a facility that was formerly a ductile iron foundry involved in the casting and sale of water piping and associated materials. The hazardous waste which was managed in the Closed Landfill (SWMU 21) was D006, D008, D018, D027, and D039. The Closed Landfill (SWMU 21) has an approved cap and cover installed over the remaining waste. These actions are intended to mitigate the potential for future groundwater contamination. The proposed permit will contain provisions for post-closure care for the Closed Landfill (SWMU 21) and corrective action for groundwater contamination.

Additional provisions have been included in the permit as a result of the changes made to AHWMMA to incorporate the requirements of the 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA. These requirements are included in accordance with ADEM Admin. Code r. 335-14-5-.06(12), which addresses corrective action for Solid Waste Management Units (SWMUs). This rule requires a RCRA Facility Assessment (RFA) of all SWMUs to be conducted at the facility. The RFA for Mueller Property Holdings, LLC has been completed and SWMUs have been identified. All SWMUs are recommended for further sampling and corrective action if necessary.

VI. TECHNICAL CONTACT

Ben King
Engineering Services Section
Industrial Hazardous Waste Branch, Land Division
Alabama Department of Environmental Management
1400 Coliseum Blvd (ZIP 36110-2059)
P.O. Box 301463 (ZIP 36130-1463)
Montgomery, Alabama
334-394-4330

PART I

STANDARD AND GENERAL FACILITY CONDITIONS

I.A. EFFECT OF PERMIT

Issuance of this permit does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under the AHWMMA, or any other law governing protection of public health or the environment, for any imminent and substantial endangerment to human health, welfare, or the environment.

I.B. 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.

I.C. DUTIES AND REQUIREMENTS

1. Duty to Comply

   The Permittee shall comply with all conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit. Any permit noncompliance, other than noncompliance authorized by an emergency permit, constitutes a violation of the AHWMMA, and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or denial of a permit renewal application.

2. Duty to Reapply

   a. 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.

   b. The Permittee must submit an application for a new permit for both post-closure and Solid Waste Management Unit (SWMU) corrective action at least 180 calendar days before the expiration of this permit. The Permittee must reapply in order to fulfill the 30-year post-closure care period required by ADEM Admin. Code Rule 335-14-5-.07(8)(a)1. The Department may shorten or extend the post-closure care period applicable to the hazardous waste facility in accordance with ADEM Admin. Code Rules 335-14-5-.07(8)(a)2. and 335-14-8-.03(1)(b).

3. 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 in order to maintain compliance with the conditions of this permit.

4. 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.

5. Proper Operation and Maintenance

The Permittee shall, at all times, properly operate and maintain all facilities and systems of treatment, monitoring, and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance (O&M) includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

6. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause as specified in ADEM Admin. Code Rules 335-14-8-.04(2), 335-14-8-.04(3) and 335-14-8-.04(4). The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay any permit condition.

7. Property Rights

Issuance of this permit does not convey any property rights of any sort, nor any exclusive privilege.

8. Duty to Provide Information

The Permittee shall furnish to the Department, within a reasonable time as determined by the Department, any relevant information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

9. Inspection and Entry

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

a. Enter at reasonable times upon the Permittee's premises where a 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; and,

d. Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the AHWMMA, any substances or parameters at any location. The Permittee shall have the opportunity to split samples during sampling.

10. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from ADEM Admin. Code Rule 335-14-2-Appendix I or the methods specified in Appendix F of the permit application. Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846 (latest edition), Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020), Standard Methods for the Examination of Water and Wastewater (latest edition), the methods specified in Appendix F of the permit application, or an alternative method approved by ADEM. [ADEM Admin. Code Rule 335-14-8-.03(1)(j)1.]

b. The Permittee shall maintain at the facility records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, the certification required by 335-14-5-.05(4)(b)9., records of all data used to prepare documents required by this permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or record, or until corrective action is completed, whichever date is later. This period may be extended by the Department at any time and is automatically extended during the course of any unresolved enforcement action regarding this facility. [ADEM Admin. Code Rules 335-14-5-.05(5)(b) and 335-14-8-.03(1)(j)2.]

c. The Permittee shall maintain at the facility records for all groundwater monitoring wells, piezometers and associated groundwater surface elevations throughout the post-closure care period. These records shall include the surveyed location, surveyed elevation, surveyed elevation reference point, total depth, screened interval, construction details, well log, and all other pertinent information for each well and piezometer.

d. Records for monitoring information shall include:

i. The date(s), exact place, and times of sampling or measurements;

ii. The individual(s) who performed the sampling or measurements;

iii. The date(s) analyses were performed;

iv. The individual(s) who performed the analyses;

v. The analytical techniques or methods used; and,

vi. The results of such analyses.

e. The following documents and information shall be maintained throughout the post-closure care period at the facility environmental coordinator office at Mueller Property Holdings, LLC office in Atlanta, Georgia.

i. Complete copy of this permit and the permit application.

ii. Operating record as required by ADEM Admin. Code Rule 335-14-5-.05(4) and this permit.

iii. Copies of all plans, reports, inspection schedules, inspection logs as required by ADEM Admin. Code Rule 335-14-5 and this permit.

11. Signatory Requirements

All applications, reports or information submitted to the Department shall be signed and certified in accordance with ADEM Admin. Code Rules 335-14-8-.02(2) and 335-14-8-.03(1)(k).

12. Reporting Requirements

a. Planned Changes

The Permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility and any solid waste management units identified under Part IV of this permit.

b. Anticipated Noncompliance

The Permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

c. Transfer of Permits

This permit may be transferred to a new owner or operator only if it is modified or revoked and reissued pursuant to ADEM Admin. Code Rule 335-14-8-.04(1) or ADEM Admin. Code Rule 335-14-8-.04(3)(a)1.(vii). Before transferring ownership or operation of the facility during its post-closure period, the Permittee shall notify the new owner or operator, in writing, of the requirements of ADEM Admin. Code Rules 335-14-5 and 335-14-8 and this permit.

d. Monitoring Reports

Monitoring results shall be reported at the intervals specified elsewhere in this permit.

e. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted to the Department no later than 14 calendar days following each schedule date.

f. Twenty-Four Hour Reporting

i. The Permittee shall report to the Department any noncompliance with this permit that may endanger human health or the environment. Any such information shall be reported orally within 24 hours from the time the Permittee becomes aware of the circumstances. This report shall include, but is not limited to, the following:

(I) Information concerning the release of any hazardous waste which may endanger public drinking water supplies; and,

(II) Information concerning the release or discharge of any hazardous waste, or hazardous waste constituents, or of a fire or explosion at the facility, which could threaten the environment or human health outside the facility.

ii. The description of the occurrence and its cause shall include:

(I) Name, address, and telephone number of the owner or operator;

(II) Name, address, telephone number, and EPA Identification Number of the facility;

(III) Date, time, and type of incident;

(IV) Name and quantity of material(s) involved;

(V) The extent of injuries, if any;

(VI) An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and,

(VII) Estimated quantity and disposition of recovered material that resulted from the accident.

iii. A written submission shall also be provided within 5 calendar days of the time that the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the periods of noncompliance (including exact dates and times); whether the noncompliance has been corrected, and if not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

g. Other Noncompliance

The Permittee shall report to the Department all instances of noncompliance not otherwise required by Permit Conditions I.C.12.d., I.C.12.e., or I.C.12.f. at the time any other reports required by this permit are submitted. The reports shall contain the information required by Permit Condition I.C.12.f.

h. Other Information

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information. In addition, upon request, the Permittee shall furnish to the Department any information related to compliance with this permit.

13. Certification of Construction

The Permittee may not commence treatment, storage or disposal of hazardous waste or contaminated media at any new or modified portion of the facility until the Permittee has submitted to the Department by certified mail or hand-delivery a letter (together with the certification by the construction quality assurance officer required by ADEM Admin. Code R. 335-14-5-.02(10)(d) and any other certifications required by this permit or ADEM Admin. Code Rule 335-14) signed by the Permittee and a professional engineer registered in the State of

Alabama stating that the facility has been constructed or modified in compliance with this permit where appropriate; and,

a. The Department has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of this permit; or

b. The Department has either waived the inspection or has not notified the Permittee, within 15 calendar days of the notification from the Permittee, of its intent to inspect. [ADEM Admin. Code Rule 335-14-8-.03(1)(1)2.]

14. The Permittee shall assure that all measures necessary to maintain and/or achieve compliance with all applicable requirements of ADEM Admin. Code Rules 335-14 are taken during the active life of the facility, and throughout the post-closure care period, corrective action period, and the term of this permit.

15. In the event that circumstances beyond the Permittee's control arise to prevent achievement of any deadline set forth by this permit, the Permittee may immediately, upon the occurrence thereof, request an extension by sending a written request to the Department explaining the need for the extension. The Department may, after consideration of the circumstances, grant the extension. Requests for extensions may require a permit modification pursuant to ADEM Admin. Code Rule 335-14-8-.04(2) or (3).

I.D. DEFINITIONS

For the purposes of this permit, terms used herein shall have the same meaning as those in ADEM Admin. Code Rules 335-14-1, 335-14-2, 335-14-5, and 335-14-8, unless this permit specifically provides otherwise. Where terms are not defined in the regulations or this permit, a standard dictionary reference or the generally accepted scientific or industrial meaning of the term shall define the meaning associated with such terms.

"Area of concern" (AOC), for the purposes of this permit, includes any area having a probable release of a hazardous waste or hazardous constituent which is not from a solid waste management unit and is determined by the Department to pose a current or potential threat to human health or the environment. Such areas of concern may require investigations and remedial action as required under Section 3005(c)(3) of the Resource Conservation and Recovery Act and ADEM Admin. Code Rule 335-14-8-.03(3)(b)2. in order to ensure adequate protection of human health and the environment.

"Contamination," for the purposes of this permit, refers to the presence of any hazardous constituent in a concentration that exceeds the naturally occurring concentration of that constituent in the immediate vicinity of the facility (*i.e.*, areas not affected by the facility).

"Extent of contamination," for the purposes of this permit, is defined as the horizontal and vertical areas in which the concentrations of hazardous constituents in the environmental media being investigated are above detection limits or background concentrations indicative of the region, whichever is appropriate as determined by the Department.

"Hazardous constituents," for the purposes of this permit, are those substances listed in ADEM Admin. Code Rule 335-14-2-Appendix VIII and/or ADEM Admin. Code Rule 335-14-5-Appendix IX and include hazardous constituents released from solid waste, hazardous waste, and hazardous waste constituents that are reaction by-products.

“Land Use Controls,” for the purposes of this permit, is as defined by ADEM Admin. Code Rule 335-15-1-.02.

“Method detection limit” (MDL), for the purposes of this permit, means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

“Mixed waste,” for the purposes of this permit, means a solid waste that is a mixture of hazardous waste (as defined in ADEM Admin. Code Rule 335-14-2-.01(3)) and radioactive waste (as defined in 10 CFR 61.2). The radioactive component of mixed waste is subject to regulation by the Atomic Energy Act (AEA)/Nuclear Regulatory Commission (NRC). The non-radioactive chemically hazardous component of mixed waste is subject to regulation by the AHWMMA and ADEM Admin. Code Rule 335-14.

“Operating day,” for the purposes of this permit, means any day on which hazardous waste is treated, stored, or disposed of in a unit. For example, each day that a hazardous waste storage unit contains hazardous waste is an operating day; as is each day that a disposal unit contains or receives hazardous waste, or each day that hazardous waste is treated in a treatment unit.

"Release," for the purposes of this permit, includes any spilling, leaking, pouring, emitting, emptying, discharging, injecting, escaping, leaching, pumping, or disposing into the environment of any hazardous waste or hazardous constituent.

"Solid waste management unit" (SWMU), for the purposes of this permit, includes any unit that has been used for the treatment, storage or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of solid waste. RCRA-regulated hazardous waste management units are also solid waste management units. SWMUs include areas that have been contaminated by routine and systematic releases of hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities (*e.g.*, product or process spills).

“Storm event,” for the purposes of this permit, is defined as a 1-year, 24-hour storm event or rainfall that measures 1-inch or greater in 1 hour or less. Rainfall measurements may be taken at the site, or the closest official weather monitoring station may be used.

I.E. EXPIRATION AND CONTINUATION OF PERMIT

This permit and all conditions herein will remain in effect beyond this permit's expiration date if the Permittee has submitted a new application as required by Permit Condition I.C.2. and, through no fault of the Permittee, the Department has not issued a new permit.

I.F. WASTE MINIMIZATION

1. Certification Requirements

   Pursuant to ADEM Admin. Code Rule 335-14-5-.05(4)(b)9. the Permittee must certify, no less often than annually, that:

   a. The Permittee has a program in place to reduce the volume and toxicity of hazardous waste to the degree determined by the Permittee to be economically practicable; and,

   b. The proposed method of treatment, storage or disposal is the most practicable method available to the Permittee and that it minimizes the present and future threat to human health and the environment.

2. Recording Requirements

   The Permittee shall maintain copies of this certification in the facility operating record as required by ADEM Admin. Code Rule 335-14-5-.05(4).

I.G. COST ESTIMATES

1. The Permittee shall maintain detailed written cost estimates, in current dollars, at the location specified in Permit Condition I.C.10.e. and on file with ADEM in accordance with ADEM Admin. Code Rules 335-14-5-.08(3), (5), and (10).

2. All cost estimates must be updated annually as required by ADEM Admin. Code Rule 335-14-5-.08(3)(b), (5)(b), and (10)(b).

3. The cost estimate shall be maintained and submitted in the form designated by the Department.

4. The Permittee must update the cost estimate no later than 30 calendar days after the Department has approved a modification to the Closure Plan, Post-Closure Plan, or Corrective Action Plan, or any other plan required or referenced by this permit, if the change in the plan results in an increase in the amount of the cost estimate.

I.H. FINANCIAL ASSURANCE

1. The Permittee shall demonstrate continuous compliance with ADEM Admin. Code Rule 335-14-5-.08 by providing documentation of financial assurance in at least the amount that equals or exceeds the cost estimate. Changes in financial assurance mechanisms must be approved by the Department.

2. The Permittee shall submit itemized statements for all capital expenditures and a complete, revised post-closure cost estimate to the Department when requesting approval for a reduction in the financial assurance mechanism.

I.I. PERMIT MODIFICATIONS

The Permittee shall request a permit modification whenever changes in operating plans or facility design affect any plan (*e.g.*, closure, groundwater monitoring, post-closure, or corrective action) required or referenced by this permit. The Permittee must submit a written request for a permit modification pursuant to the requirements of ADEM Admin. Code Rule 335-14-8-.04(2) at least 60 calendar days prior to the proposed change in facility design or operation.

I.J. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE DEPARTMENT

All reports, notifications, or other submissions that are required by this permit should be sent via certified mail or given to:

Chief, Land Division
Alabama Department of Environmental Management
P.O. Box 301463 (Zip 36130-1463)
1400 Coliseum Boulevard (Zip 36110-2059)
Montgomery, Alabama

PART II

POST-CLOSURE CARE

II.A. POST-CLOSURE CARE PERIOD

The post-closure care period shall extend for a period of 30 years from the date of initial post-closure permit issuance unless shortened or extended pursuant to ADEM Admin. Code Rule 335-14-5-.07(8). The post-closure care period shall automatically extend through the end of the compliance period specified in Section III of this permit.

II.B. POST-CLOSURE PROCEDURES AND USE OF PROPERTY

1. Post-Closure Activities

   The Permittee shall conduct post-closure care activities, in accordance with Section 2.0 of the permit application and as required by ADEM Admin. Code Rules 335-14-5-.07 and 335-14-5-.14(11)(d), for each hazardous waste management unit listed in Table II.1. Post-closure care shall commence upon the effective date of this permit and shall continue throughout the post-closure care period.

2. Security

   The Permittee shall comply with the security provisions of ADEM Admin. Code Rules 335-14-5-.02(5) and as described in Section 1.0 of the permit application.

3. Disturbance of Closed Unit(s)

   The Permittee shall not allow the disturbance of the integrity of the final cover, liners, any components of the containment system, or the function of the facility's monitoring systems during the post-closure care period for any unit identified in Table II.1.

4. The Permittee shall:

   a. Maintain the integrity and effectiveness of the final cover, including making repairs to the cap, as necessary, to correct the effects of settling, subsidence, erosion, or other events;

   b. Maintain and monitor the groundwater monitoring system and comply with all other applicable requirements of ADEM Admin. Code Rule 335-14-5-.06 and Part III of this permit;

   c. Prevent run-on and run-off from eroding or otherwise damaging the final cover; and,

   d. Protect and maintain surveyed benchmarks used in complying with the surveying and recordkeeping requirements of ADEM Admin. Code Rule 335-14-5-.14(10).

II.C. INSPECTIONS

1. The Permittee shall inspect the components, structures, and equipment at the site in accordance with the inspection schedule as described in Section 2.0 of the permit application, the post-closure care plan as described in Section 2.0 of the permit application, and as required by ADEM Admin. Code Rule 335-14-5-.07.

2. Monitoring and Inspection

   The Permittee shall inspect the closed hazardous waste management unit listed in Table II.1 at least weekly and after storms to detect any evidence of deterioration or improper operation as described in Section II of the permit application and as required under ADEM Admin. Code Rules 335-14-5-.07 and 335-14-5-.14. The inspections shall specifically include evaluation of the following items:

   a. Integrity of the final cover (erosion, ponding, subsidence, cracking, *etc*.);

   b. Growth and stabilization of vegetative cover;

   c. Run-on and run-off control system;

   d. Groundwater monitoring wells; and,

   e. Survey benchmarks.

TABLE II.1

POST-CLOSURE CARE UNITS

UNIT NAME	UNIT DESCRIPTION	CLOSED-IN-PLACE CAPACITY (QUANTITY)	DESCRIPTION OF UNIT*	LOCATION OF UNIT*
Landfill	Closed on Site Foundry Landfill	78,000 cubic yards	Section 2.0	Figure 3

*Location in permit application containing description (text) and location (figure) of unit.

PART III

GROUNDWATER MONITORING AND CORRECTIVE ACTION

III.A. REQUIRED PROGRAM(S)

1. Groundwater monitoring shall consist of the General Groundwater Monitoring Program of Permit Condition III.B. and the Corrective Action Monitoring Program contained in Permit Condition III.E.

2. The Permittee shall commence groundwater monitoring as required by this permit not later than 120 calendar days after the effective date of this permit.

III.B. GENERAL GROUNDWATER MONITORING PROGRAM

1. Well Location, Installation and Construction

   The Permittee shall install and/or maintain a groundwater monitoring system to comply with the requirements of ADEM Admin. Code Rules 335-14-5-.06(8), 335-14-5-.06(9), 335-14-5-.06(10), and 335-14-5-.06(11) as applicable and as specified below:

   a. The Permittee shall maintain all groundwater monitoring wells at the facility as identified in Table III.1. of this permit, at the locations specified on Figure 2B of the permit application, and any other groundwater monitoring wells specified by Permit Condition III.B.1.d.

      i. All groundwater monitoring wells shall be maintained in accordance with the plans and specifications presented in Appendix E of the permit application and in accordance with ADEM Admin. Code Rule 335-14-5-.06.

      ii. A groundwater monitoring well shall not be removed from any monitoring program specified in this permit without an approved permit modification pursuant to Permit Condition III.I.

      iii. If a groundwater monitoring well is damaged, the Permittee shall immediately notify the Department in writing, which includes a description of the well repair activities to be conducted. The well repair procedures must be approved by the Department prior to implementation. Within 30 calendar days after the well is repaired, the Permittee shall submit a written notification to the Department that the well repair activities were conducted in accordance with the approved procedures.

iv. If a groundwater monitoring well is deleted from the monitoring program(s) required by this permit in accordance with Permit Conditions III.B.1.a.ii. and I.I., it shall be abandoned within 90 calendar days after deletion using procedures to be approved by the Department. Within 30 calendar days after the well is abandoned, the Permittee shall submit a written notification to the Department that the well abandonment activities were conducted in accordance with the approved procedures.

b. Groundwater monitoring wells MW-1R, MW-2R, MW-2BR, MW-2C, and MW-3R shall define the point of compliance for the closed landfill.

c. The Permittee shall maintain groundwater monitoring well(s) MW-5R, as the background monitoring well(s) for the entire facility as specified in Appendix E of the permit application.

d. The Permittee shall install and maintain additional groundwater monitoring wells as necessary to assess changes in the rate and extent of any plume of contamination or as otherwise deemed necessary to maintain compliance with ADEM Admin. Code Rules 335-14-5-.06(6), 335-14-5-.06(8), 335-14-5-.06(9), 335-14-5-.06(10), and 335-14-5-.06(11), as applicable. A plan in the form of a permit modification request specifying the design, location and installation of any additional monitoring wells should be submitted to the Department at least 90 calendar days prior to installation which, at a minimum, shall include:

i. Well construction techniques including casing depths and proposed total depth of well(s);

ii. Well development method(s);

iii. A complete description of well construction materials;

iv. A schedule of implementation for construction; and,

v. Provisions for determining the lithologic characteristics, hydraulic conductivity, grain size distribution, and porosity for the applicable aquifer unit(s) at the location of the new well(s).

2. General Groundwater Monitoring Requirements

   a. The Permittee shall determine the groundwater surface elevation from all monitoring wells listed in Table III.1. of this permit at least semi-annually and each time a sampling event is conducted. The results of these determinations should be submitted in accordance with Permit Condition III.B.6. Elevation data should be recorded and reported as mean sea level (MSL) and referenced to an appropriate national geodetic vertical datum (NGVD) benchmark.

   b. The Permittee shall determine the groundwater flow rate and direction in the underlying aquifer(s) at least annually and submit the results in accordance with Permit Condition III.B.6.

   c. The Permittee shall determine background concentrations of hazardous constituents and other chemical parameters required to be monitored by this permit in accordance with Section 3.0 of the permit application and ADEM Admin. Code Rule 335-14-5-.06(8)(g).

3. Groundwater Protection Standard

   a. The groundwater protection standard, as required under ADEM Admin. Code Rule 335-14-5-.06(3), shall consist of Table III.3 of this permit which lists the hazardous constituents and their respective concentration limits.

   b. The groundwater protection standard applies to all hazardous waste or hazardous constituent releases as deemed appropriate by the Department to protect human health and the environment.

4. Compliance Period

   a. The compliance period, during which the groundwater protection standard specified in Permit Condition III.B.3. applies, shall begin at the time of the first sampling event of the compliance monitoring program (Permit Condition III.D.), or the corrective action monitoring program (Permit Condition III.E.), whichever is earlier.

   b. The compliance period shall continue (after beginning pursuant to Permit Condition III.B.4.a.) until the groundwater protection standard as defined by Permit Condition III.B.3.a. has not been exceeded for a period of three consecutive years.

c. If the Permittee is engaged in a corrective action program pursuant to Permit Condition III.E., then the compliance period shall continue as required by ADEM Admin. Code Rule 335-14-5-.06(7)(c) until the groundwater protection standard has not been exceeded for a period of three consecutive years after corrective action has been terminated and this permit has been modified, in accordance with Permit Condition I.I., to implement a compliance monitoring program pursuant to Permit Condition III.D. or a detection monitoring program pursuant to Permit Condition III.C., as required by ADEM Admin. Code Rule 335-14-5-.06(11)(f).

5. Sampling and Analysis Procedures

The Permittee shall use the following techniques and procedures when obtaining and analyzing samples from the groundwater monitoring wells described in Permit Condition III.B.1. to provide a reliable indication of the quality of the groundwater as required under ADEM Admin. Code Rules 335-14-5-.06(8)(d), (e), and (g):

a. Samples shall be collected, preserved, and shipped (when shipped off-site for analysis) in accordance with the procedures specified in Appendix F of the permit application.

b. Samples shall be analyzed according to the procedures specified in Appendix F of the permit application, the most recent edition of SW-846 or other appropriate methods approved by the Department. Analytical method detection limits shall be less than, or equal to, the concentration limits specified in Table III.2 or III.3.

c. Samples shall be tracked and controlled using the chain-of-custody procedures specified in Appendix F of the permit application.

d. Statistical analyses used to evaluate the groundwater monitoring data shall be as described in Appendix E of the permit application and ADEM Admin. Code Rule 335-14-5-.06(8)(h).

e. All samples taken in accordance with this permit shall not be filtered prior to analysis.

6. Recordkeeping and Reporting

a. The Permittee shall keep and maintain all monitoring, testing, and analytical data obtained in accordance with Permit Conditions III.B., III.C., III.D., and III.E. as required by Permit Condition I.C.10.

b. The Permittee shall submit to the Department a written report to include all analytical sampling data, established background values, statistical evaluations, groundwater

elevations, associated potentiometric maps, and the annual groundwater flow rate and direction determinations. The analytical method and the method detection limit (MDL) for each constituent must be integrated into all reports of analysis. The report shall be submitted within 60 calendar days after the first sampling event and on an annual basis thereafter. Copies of this report shall be kept at the facility in accordance with Permit Conditions I.C.10.c. and I.C.10.e.

c. The Permittee shall submit progress reports to the Department describing implementation of groundwater monitoring and/or corrective action activities at the site as required by Part III of this permit on a quarterly basis. The first progress report shall be submitted to the Department within 90 calendar days after the effective date of this permit. The progress reports shall continue until such time as the required monitoring and/or corrective action systems and activities required by this permit are fully constructed and operational. In the event that additional monitoring and/or corrective action requirements are imposed through a permit modification, the quarterly reporting requirement shall resume, commencing upon the effective date of the permit modification and continuing until the required monitoring and/or corrective action systems and activities are again fully constructed and operational.

III.C. DETECTION MONITORING PROGRAM (RESERVED)

III.D. COMPLIANCE MONITORING PROGRAM (RESERVED)

III.E. CORRECTIVE ACTION MONITORING PROGRAM

The requirements of this Condition are applicable to the closed on-site landfill (SWMU 21). Except as specified otherwise in this permit, the Corrective Action Monitoring Program shall be implemented in accordance with Appendix E of the permit application and ADEM Admin. Code Rule 335-14-5-.06(11).

1. Monitoring Systems

In addition to the point of compliance and background monitoring well systems identified in Permit Conditions III.B.1.b. and III.B.1.c., the Permittee shall:

a. Maintain groundwater monitoring wells MW 7, MW-8B, MW-8C, MW-9, MW-9B, MW-14R, MW-15, MW-16, and MW-17 as boundary wells for the entire facility as specified in Table III.1. of this permit and as shown on Figure D-2 of the permit application.

b. Maintain groundwater monitoring wells MW-6, MW-8, MW-12, and MW-13 as effectiveness wells as specified in Table III.1. of this permit and as shown on Figure D-2 of the permit application.

c. Maintain wells RW-1, RW-4, and RW-5 as recovery wells as specified in Table III.1. of this permit and as shown on Figure D-2 of the permit application.

d. Maintain wells MW-1R, MW-2R, MW-2BR, MW-2C, and MW-3R as point of compliance wells as specified in Table III.1. of this permit and as shown on Figure D-2 of the permit application.

2. Corrective Action Program

a. The Permittee shall conduct a Corrective Action Program, as described in Appendix E of the permit application, to remove or treat in place all hazardous constituents that exceed their respective groundwater protection standards as described in Table III.3. of this permit at the point of compliance, between the point of compliance and the down-gradient facility property boundary, and beyond the facility boundary in accordance with ADEM Admin. Code Rule 335-14-5-.06(11)(e)2.

b. Pursuant to ADEM Admin. Code Rules 335-14-5-.06(11)(c) and 335-14-5-.06(11)(e)3., the Permittee shall continue to implement the corrective action program as described in Appendix E of the permit application within 120 calendar days after the effective date of this permit.

c. The Permittee shall handle or treat groundwater in accordance with Appendix E of the permit application and with the applicable requirements of NPDES, SID, and AIR permit number(s) AL0075388, IU39-37-00666, and 4-07-0360-01, as issued by the Department.

3. Monitoring Requirements

In addition to the general groundwater monitoring requirements specified in Permit Condition III.B.2., the Permittee shall:

a. Sample all background, point of compliance and effectiveness monitoring wells shown in Table III.1. of this permit and analyze for the constituents listed in Table III.2. of this permit on a semi-annual basis beginning within 120 calendar days of the effective date of this permit and continuing through the end of the compliance period.

b. Sample all background, point of compliance, effectiveness, and boundary monitoring wells shown in Table III.1. of this permit and analyze for the constituents listed in Table III.3. of this permit on an annual basis beginning within 120 calendar days of the effective date of this permit and continuing through the end of the compliance period.

c. Sample all background, point of compliance, effectiveness, and boundary monitoring wells shown in Table III.1. of this permit and analyze for temperature (degrees F or C), specific conductance (Mhos/cm), and pH (standard units) each time the well is sampled. The data obtained should be submitted as raw data in the reports required by Permit Condition III.B.6.

d. When evaluating the monitoring results to determine the effectiveness of the corrective measures, in accordance with Permit Condition III.E.4., the Permittee shall:

i. Determine if the corrective action system effectively addresses the entire plume of contamination;

ii. Determine if the concentration of the hazardous constituents are decreasing (pH increasing or decreasing toward neutrality, as applicable) in the effectiveness wells specified in Permit Condition III.A.1.;

iii. Determine if hazardous waste or hazardous constituents are being released into the environment; and,

iv. Determine if hazardous constituents have been detected in the boundary wells specified in Permit Condition III.A.1.

4. Reporting and Response Requirements

In addition to the recordkeeping and reporting requirements specified in Permit Condition III.B.6.:

a. The Permittee shall report the effectiveness of the corrective action program semi-annually, as required under ADEM Admin. Code Rule 335-14-5-.06(11)(g). These reports shall be submitted to the Department within 60 calendar days of each semi-annual anniversary of this permit after corrective action is initiated and continue until corrective action is completed. The Permittee must provide data from groundwater monitoring along with an analysis of that data and any conclusions regarding the effectiveness of the program in accordance with Permit Condition III.E.3.d. If the analysis of the data warrants any change to the corrective action program, the Permittee must include these revisions in the semi-annual report, which will be followed-up within 90 calendar days with an application for permit modification in accordance with Permit Condition I.I.

b. If corrective action is terminated under Permit Condition III.B.4.c., the Permittee must sample all background, point of compliance, effectiveness and boundary sampling locations for the compounds listed in ADEM Admin. Code Rule 335-14-5-Appendix IX. Based upon the sampling results, the Permittee may petition the Department, in accordance with Permit Condition I.I., for a permit modification to implement either a detection monitoring program or a compliance monitoring program.

TABLE III.1

MONITORING WELL DESIGNATIONS

WELL NUMBER	WELL TYPE *	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP-OF-RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. MSL)	MONITORED ZONE
MW-1R	POC	33 33 18.21N	86 48 33.46W	Landfill	23.46	573.52	576.51	11-21	Shallow-Intermediate/Knox-Shady
MW-2R	POC	33 33 16.30N	86 48 33.67W	Landfill	31.12	574.30	576.95	19-29	Shallow-Intermediate/Knox-Shady
MW-2BR	POC	33 33 16.07N	86 48 34.02W	Landfill	129.97	574.30	575.28	125-130	Deep-Bedrock/Knox-Shady
MW-2C	POC	33 33 15.88N	86 48 33.58W	Landfill	124.95	574.43	576.90	202.8-222.8	Deep-Bedrock/Knox-Shady
MW-3R	POC	33 33 17.07N	86 48 37.36W	Landfill	32.68	576.49	579.69	21-31	Shallow-Intermediate/Knox-Shady
MW-5R	BKG	33 33 24.79N	86 48 35.84W	Landfill	26.80	577.54	580.39	13-29	Shallow-Intermediate/Knox-Shady
MW-6	EFF	33 33 13.35N	86 48 33.37W	Landfill	23.72	572.79	574.58	12-22	Shallow-Intermediate/Knox-Shady
MW-7	BDY	33 33 11.98N	86 48 32.91W	Landfill	28.13	571.67	574.72	16-26	Shallow-Intermediate/Knox-Shady
MW-8	EFF	33 33 14.30N	86 48 35.25W	Landfill	23.64	574.20	577.19	11.5-21.5	Shallow-Intermediate/Knox-Shady
MW-8B	BDY	33 33 14.35N	86 48 35.47W	Landfill	123.94	574.86	576.81	115-125	Deep-Bedrock/Knox-Shady

TABLE III.1

MONITORING WELL DESIGNATIONS (Contuned)

WELL NUMBER	WELL TYPE *	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP-OF-RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. MSL)	MONITORED ZONE
MW-8C	BDY	33 33 14.35N	86 48 35.64W	Landfill	224.82	575.00	577.02	215-225	Deep-Bedrock/Knox-Shady
MW-9	BDY	33 33 15.90N	86 48 32.22W	Landfill	23.74	571.79	574.73	11.5-21.5	Shallow-Intermediate/Knox-Shady
MW-9B	BDY	33 33 15.95N	86 48 32.11W	Landfill	124.46	572.15	574.11	115-125	Deep-Bedrock/Knox-Shady
MW-10	PGM	33 33 16.63N	86 48 32.04W	Landfill	21.33	571.29	574.65	7-17	Shallow-Intermediate/Knox-Shady
MW-11	PGM	33 33 14.66N	86 48 32.66W	Landfill	19.92	572.24	575.51	8-18	Shallow-Intermediate/Knox-Shady
MW-12	EFF	33 33 11.14N	86 48 34.95W	Landfill	28.18	572.93	572.78	19-29	Shallow-Intermediate/Knox-Shady
MW-13	EFF	33 33 12.82N	86 48 37.41W	Landfill	27.84	576.06	579.15	16.5-26.5	Shallow-Intermediate/Knox-Shady
MW-14R	BDY	33 33 11.26N	86 48 38.05W	Landfill	22.34	575.22	575.38	13-23	Shallow-Intermediate/Knox-Shady
MW-15	BDY	33 33 12.12N	86 48 31.43W	Landfill	26.56	569.44	571.38	15-25	Shallow-Intermediate/Knox-Shady

TABLE III.1

MONITORING WELL DESIGNATIONS (Continued)

WELL NUMBER	WELL TYPE *	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP-OF-RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. MSL)	MONITORED ZONE
MW-16	BDY	33 33 16.98N	86 48 30.99W	Landfill	27.20	572.81	575.03	15-25	Shallow-Intermediate/Knox-Shady
MW-17	BDY	33 33 10.31N	86 48 35.16W	Landfill	26.91	571.77	573.81	15-25	Shallow-Intermediate/Knox-Shady
TW-1	PGM	33 33 19.42N	86 48 33.44W	Landfill	15.18	574.79	574.39	6-16	Shallow-Intermediate/Knox-Shady
TW-2	PGM	33 33 20.47N	86 48 33.42W	Landfill	15.04	574.91	574.90	6-16	Shallow-Intermediate/Knox-Shady
TW-3	PGM	33 33 21.81N	86 48 33.43W	Landfill	13.66	575.27	575.24	6-16	Shallow-Intermediate/Knox-Shady
TW-4	PGM	33 33 24.16N	86 48 33.46W	Landfill	19.20	575.62	575.32	11-21	Shallow-Intermediate/Knox-Shady
RW-1	REC	33 33 16.361N	86 48 33.545W	Landfill	40	574.16	572.68	10-40	Shallow-Intermediate/Knox-Shady

TABLE III.1

MONITORING WELL DESIGNATIONS (Continued)

WELL NUMBER	WELL TYPE *	WELL LATITUDE	WELL LONGITUDE	UNIT(S) MONITORED	WELL DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP-OF-RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. MSL)	MONITORED ZONE
RW-4	REC	33 33 16.740N	86 48 32.820W	Landfill	40	573.32	572.93	10-40	Shallow-Intermediate/Knox-Shady
RW-5	REC	33 33 16.500N	86 48 33.060W	Landfill	40	573.40	572.98	10-40	Shallow-Intermediate/Knox-Shady

* Well Type:
POC - Point of Compliance Wells
EFF - Effectiveness Monitoring Wells
PGM - Piezometers and/or General Monitoring Wells
BKG - Background Wells
BDY - Boundary Monitoring Wells
REC - Recovery Well

TABLE III.2

GROUNDWATER QUALITY MONITORING CONSTITUENTS*

HAZARDOUS CONSTITUENT	UNIT*
Arsenic	Landfill
Barium	Landfill
Beryllium	Landfill
Cadmium	Landfill
Chromium	Landfill
Copper	Landfill
Lead	Landfill
Nickel	Landfill
Zinc	Landfill
Bis(2-ethylhexyl)phthalate	Landfill
1,1-Dichloroethane	Landfill
1,2-Dichloroethane	Landfill
1,1-Dichloroethylene	Landfill
cis-1,2-Dichloroethylene	Landfill
trans-1,2-Dichloroethylene	Landfill
1,1,1-Trichloroethane	Landfill
1,1,2-Tichloroethane	Landfill
Trichloroethylene	Landfill
Vinyl Chloride	Landfill

The constituents listed herein are the subset of the Groundwater Protection Standard listed in Table III.3 for which monitoring is required.

* Identifies the unit(s) at which the given constituent must be monitored.

TABLE III.3

GROUNDWATER PROTECTION STANDARD

HAZARDOUS CONSTITUENT	UNIT*	CONCENTRATION LIMIT (mg/L)
Arsenic	Landfill	0.01
Barium	Landfill	2
Beryllium	Landfill	0.004
Cadmium	Landfill	0.005
Chromium	Landfill	0.1
Copper	Landfill	1.3
Lead	Landfill	0.015
Nickel	Landfill	0.02
Zinc	Landfill	0.6
Acrolein	Landfill	0.0000042
Acrylonitrile	Landfill	0.000039
Bis(2-chloro-1-methylethyl)ether	Landfill	0.00036
Bis(2-ethylhexyl)phthalate	Landfill	0.006
1,2-Dibromo-3-chloropropane	Landfill	0.0002
1,2-Dibromoethane	Landfill	0.00005
Dibenzo(A,H)Anthracene	Landfill	0.0000092
1,1-Dichlorethane	Landfill	0.0028
1,2-Dichloroethane	Landfill	0.005
1,1-Dichlorethene	Landfill	0.007
cis-1,2-Dichlorethene	Landfill	0.07
trans-1,2-Dichloroethene	Landfill	0.1
cis-1,3-Dichloropropene	Landfill	0.0004
trans-1,3-Dichloropropene	Landfill	0.0004
Indeno (123-CD) Pyrene	Landfill	0.000092
Vinyl Chloride	Landfill	0.002
Naphthalene	Landfill	0.00062
Pentachlorophenol	Landfill	0.001
1,1,2,2-Tetrachloroethane	Landfill	0.000055
1,2,3-Trichloropropane	Landfill	0.0000056
1,1,1-Trichloroethane	Landfill	0.2
1,1,2-Trichloroethane	Landfill	0.005
Trichloroethene	Landfill	0.005

PART IV

SOLID WASTE MANAGEMENT UNIT IDENTIFICATION AND EVALUATION

IV.A. APPLICABILITY

The Conditions of this Part apply to:

1. The solid waste management units (SWMUs) and areas of concern (AOCs) identified in Table IV.1, which require investigation and/or remediation;

2. The SWMUs identified in Table IV.2, which require no further investigation under this permit at this time;

3. Any additional SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means; and,

4. Contamination beyond the facility boundary, if applicable. The Permittee shall implement corrective actions beyond the facility boundary where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of the Department that, despite the Permittee's best efforts, as determined by the Department, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis. Assurances of financial responsibility for completion of such off-site corrective action will be required.

IV.B. NOTIFICATION AND ASSESSMENT REQUIREMENTS FOR NEWLY IDENTIFIED SWMUs AND AOCs

1. The Permittee shall notify the Department in writing, within 15 calendar days of discovery, of any additional AOC(s) as described under Permit Condition IV.A.3. The notification shall include, at a minimum, the location of the AOC(s) and all available information pertaining to the nature of the release (*e.g.,* media affected, hazardous constituents released, magnitude of release, *etc.*). If the Department determines that further investigation of an AOC is required, the permit will be modified in accordance with ADEM Admin. Code Rule 335-14-8-.04(2).

2. The Permittee shall notify the Department in writing, within 15 calendar days of discovery, of any additional SWMUs as described under Permit Condition IV.A.3.

3. The Permittee shall prepare and submit to the Department, within 90 calendar days of notification, a SWMU Assessment Report (SAR) for each SWMU identified under Permit Condition IV.B.2. At a minimum, the SAR shall provide the following information:

   a. Location of unit(s) on a topographic map of appropriate scale such as required under ADEM Admin. Code Rule 335-14-8-.02(5)(b)19.

b. Designation of type and function of unit(s).

c. General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings).

d. Dates that the unit(s) was operated.

e. Specification of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous constituents in the wastes.

f. All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include groundwater data, soil analyses, air, and/or surface water data).

4. Based upon the results of the SAR, the Department shall determine the need for further investigations at the SWMUs covered in the SAR. If the Department determines that such investigations are needed, the Permittee shall initiate an investigation as outlined in Permit Condition IV.D.1 immediately upon receiving notification of the Department's determination.

IV.C. NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES AT PREVIOUSLY IDENTIFIED SWMUs or AOCs

1. The Permittee shall notify the Department in writing of any newly discovered release(s) of hazardous waste or hazardous constituents discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, within 15 calendar days of discovery. Such newly discovered releases may be from SWMUs or AOCs identified in Permit Condition IV.A.2 or SWMUs or AOCs identified in Permit Condition IV.A.3 for which further investigation was not required.

2. If the Department determines that further investigation of the SWMUs or AOCs is needed, the Permittee shall initiate an investigation as outlined in Permit Condition IV.D. immediately upon receiving notification of the Department's determination.

IV.D. RCRA FACILITY INVESTIGATION (RFI)

1. The Permittee must perform a RCRA Facility Investigation (RFI) for any SWMU and AOC identified by the Department in accordance with Permit Conditions IV.A.1, IV.B.4, and IV.C.2.

2. The RFI must completely identify the concentration of hazardous constituents released from each SWMU and AOC and fully delineate the area where such hazardous constituents have come to be located.

3. The RFI must fully characterize the nature and extent of contamination released from each SWMU or AOC under investigation.

4. The RFI must be performed in a manner consistent with the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.

5. Except as provided by Permit Condition IV.D.6., the RFI must be completed within 180 calendar days from the effective date of this permit or, for SWMUs or AOCs identified pursuant to Permit Condition IV.B. and C., within 180 calendar days from the receipt of notification from the Department that an RFI is required. If, prior to the effective date of this permit, the Department has approved a work plan that includes a schedule for completing the RFI, the RFI shall be completed in accordance with the approved schedule.

6. RFI Schedule of Compliance

    a. For RFIs expected to require greater than 180 calendar days to complete, the Permittee may submit a schedule of compliance subject to Departmental approval and/or modification.

    b. Submittal of an RFI Schedule of Compliance does not delay or otherwise postpone the Permittee's obligation to initiate the RFI.

    c. The Schedule of Compliance must include:

        i. A detailed narrative discussion, which explains why the RFI cannot be completed within 180 days; and,

        ii. A detailed and chronological listing of milestones with estimated durations that provides sufficient information to track the progress of the investigation.

    d. The RFI Schedule of Compliance shall be reviewed by the Department in accordance with Permit Condition IV.G.

    e. The Permittee shall complete the RFI in accordance with the approved RFI Schedule of Compliance.

7. RFI Progress Reports

    a. For an RFI being conducted in accordance with the approved RFI Schedule of Compliance, the Permittee must submit progress reports on a monthly basis.

    b. The RFI Progress Reports must include:

        i. A description of the RFI activities completed during the reporting period;

        ii. Summaries of any problems or potential problems encountered during the reporting period;

        iii. Actions taken to rectify problems;

        iv. Changes in relevant personnel;

        v. Projected work for the next reporting period;

vi. Any proposed revisions to the RFI Schedule of Compliance. Modifications of the RFI Schedule of Compliance are subject to approval by the Department; and,

vii. A summary of any data collected during the reporting period, including:

A. The location of each sampling point identified on a site map;

B. The concentration of each hazardous constituent detected at each sampling point; and,

C. Submittal of RFI Progress Reports, work plans, or other documents during the RFI does not alter the approved RFI Schedule of Compliance.

8. RFI Reports

a. The Permittee shall prepare and submit to the Department an RFI Report within 60 calendar days from the completion of investigation activities in accordance with the approved RFI Schedule of Compliance, if applicable.

b. The RFI Report must provide a detailed description of all required elements of the investigation as described in the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.

c. The RFI Report shall be reviewed by the Department in accordance with Permit Condition IV.G.

IV.E. SELECTION OF CORRECTIVE MEASURES AND PERMIT MODIFICATION

1. The Permittee shall develop and submit to the Department a Corrective Measures Implementation (CMI) Plan for any areas of the Permittee's site where hazardous constituents have come to be located at concentrations exceeding those appropriate for the protection of human health and the environment. The CMI Plan must include all applicable elements of the proposed remedy pursuant to the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.

2. The CMI Plan shall be submitted to the Department within 120 calendar days following the Permittee's submittal of the RFI Report indicating that hazardous constituents have come to be located at any area of the Permittee's facility, or beyond the facility, at concentrations exceeding those appropriate for the protection of human health and the environment, or within 120 calendar days following notification from the Department that a CMI Plan is required, whichever occurs earlier.

3. The CMI Plan shall be submitted along with a request for permit modification pursuant to ADEM Admin. Code R. 335-14-8-.04(2), and shall include any applicable fees pursuant to ADEM Admin. Code R. 335-1-6. This modification will serve to incorporate the proposed final remedy, including all procedures necessary to implement and monitor the remedy, into this permit.

4. Within 120 calendar days after this Permit has been modified in accordance with Permit Condition IV.E.3., the Permittee shall demonstrate financial assurance for completing the approved remedy.

IV.F. INTERIM MEASURES (IM)

1. IM Work Plan(s)

   a. Upon notification by the Department, the Permittee shall prepare and submit an Interim Measures (IM) Work Plan for any SWMU or AOC that the Department determines is necessary. IM are necessary in order to minimize or prevent further migration of contaminants and limit human and environmental exposure to contaminants while long-term corrective measures are evaluated and, if necessary, implemented. The IM Work Plan shall be submitted within 30 calendar days of such notification and shall include the elements listed in Permit Condition IV.F.1.b. Such IM may be conducted concurrently with investigations required under the terms of this permit. The Permittee may initiate IM by submitting an IM Work Plan for approval and reporting in accordance with the requirements under Permit Condition IV.F.

   b. The IM Work Plan shall ensure that the IM are designed to mitigate any current or potential threat(s) to human health or the environment and is consistent with and integrated into any long-term solution at the facility. The IM Work Plan shall include: the IM objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.

   c. The IM Work Plan must be approved by the Department, in writing, prior to implementation. The Department shall specify the start date of the IM Work Plan schedule in the letter approving the IM Work Plan.

   d. The IM Report shall be reviewed by the Department in accordance with Permit Condition IV.G.

2. IM Implementation

   a. The Permittee shall implement the IM in accordance with the approved IM Work Plan.

   b. The Permittee shall give notice to the Department as soon as possible of any planned changes, reductions or additions to the IM Work Plan.

   c. Final approval of corrective action required under ADEM Admin. Code Rule 335-14-5-.06(12), which is achieved through IM, shall be in accordance with ADEM Admin. Code Rule 335-14-8-.04(2) and Permit Condition IV.E.

3. IM Reports

   a. If the time required for completion of IM is greater than one year, the Permittee shall provide the Department with Progress Reports at intervals specified in the approved work plan. The Progress Reports shall, at a minimum, contain the following information:

i. A description of the portion of the IM completed;

ii. Summaries of any deviations from the IM Work Plan during the reporting period;

iii. Summaries of any problems or potential problems encountered during the reporting period;

iv. Projected work for the next reporting period; and,

v. Copies of laboratory/monitoring data.

b. The Permittee shall prepare and submit the IM Report to the Department within 90 calendar days of completion of IM conducted under Permit Condition IV.F. The IM Report shall, at a minimum, contain the following information:

i. A description of IM implemented;

ii. Summaries of results;

iii. Summaries of all problems encountered;

iv. Summaries of accomplishments and/or effectiveness of IM; and,

v. Copies of all relevant laboratory or monitoring data, *etc.*, in accordance with Permit Condition I.C.10.

IV.G. SUBMITTALS

1. All work plans, reports, schedules, and other documents ("submittals") required by this permit shall be subject to approval by the Department to assure that such submittals and schedules are consistent with the requirements of this Permit and with applicable regulations and guidance. The Permittee shall revise all submittals and schedules as directed by the Department.

2. The Department will review all submittals in accordance with the conditions of this permit. The Department will notify the Permittee in writing of any submittal that is disapproved, and the basis therefore. If the Department disapproves a submittal, the Department shall: (1) notify the Permittee in writing of the submittal's deficiencies and specify a due date for submission of a revised submittal, (2) revise the submittal and notify the Permittee of the revisions, or (3) conditionally approve the submittal and notify the Permittee of the conditions. Permit Condition IV.H. shall apply only to submittals that have been disapproved and revised by the Department, or that have been disapproved by the Department, then revised and resubmitted by the Permittee, and again disapproved by the Department.

3. All submittals shall be submitted within the time frame specified by the Department and in accordance with the approved schedule of compliance. Extensions of the due date for submittals may be granted by the Department based on the Permittee's demonstration that sufficient justification for the extension exists.

4. All submittals required by this permit shall be signed and certified in accordance with ADEM Admin. Code Rule 335-14-8-.02(2).

5. Two (2) copies of all submittals shall be provided by the Permittee to the Department in accordance with Permit Condition I.J.

IV.H. DISPUTE RESOLUTION

Notwithstanding any other provision in this permit, in the event the Permittee disagrees, in whole or in part, with the Department's revision of a submittal or disapproval of any revised submittal required by this Part, the following may, at the Permittee's discretion, apply:

1. In the event that the Permittee chooses to invoke the provisions of this section, the Permittee shall notify the Department in writing within 30 calendar days of receipt of the Department's revision of a submittal or disapproval of a revised submittal. Such notice shall set forth:

    a. The specific matters in dispute;

    b. The position the Permittee asserts should be adopted as consistent with the requirements of this permit;

    c. The basis for the Permittee's position; and,

    d. Any matters considered necessary for the Department's determination.

2. The Department and the Permittee shall have additional 30 calendar days from the Department's receipt of the notification provided for in Permit Condition IV.H.1. to meet or confer to resolve any disagreement.

3. In the event agreement is reached, the Permittee shall submit and implement the revised submittal in accordance with and within the time frame specified in such agreement.

4. If agreement is not reached within the 30-day period, the Department will notify the Permittee in writing of his/her decision on the dispute, and the Permittee shall comply with the terms and conditions of the Department's decision in the dispute. For the purposes of this provision in this permit, the responsibility for making this decision shall not be delegated below the Land Division Chief.

5. With the exception of those conditions under dispute, the Permittee shall proceed to take any action required by those portions of the submission and of this permit that the Department determines are not affected by the dispute.

Table IV.1

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring a RCRA Facility Investigation (RFI):

SWMU/AOC NUMBER*	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA

Table IV.2

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring no further action at this time:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
1	Raw Material Storage Area	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
2	Raw Material Storage Pile	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
3	Emission Control System Afterburner	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
4	Heat Exchangers	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
5	Heat Exchangers	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
6	Emission Control System Quench Tank	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
7	Cupola Baghouse	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
8	Baghouse Dust Treatment System	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
9	Basement	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
10	Scrap Reclaiming Area	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
11	Ductile Baghouse	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water

Table IV.2 (Continued)

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring no further action at this time:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
12	Cement Lining Settling Basin	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
13	Cement Lining Settling Basin	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
14	Scalping Basin	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
15A	Scalping Basin	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
15B	Scalping Basin	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
16	Primary Treatment Pond	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
17	Secondary Treatment Pond	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
18	Used Oil Accumulation Area	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
19	Used Oil Storage Tank	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water

Table IV.2 (Continued)

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring no further action at this time:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
20	Empty Drum Storage Area	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
21	Landfill	NFA per RFA dated, September 21, 2007	Air, Soil, Ground Water, Surface Water, Subsurface Gas
22	Spray Pond	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
23	Core Mold Containers	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
24	Paint Leak Area	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
25	De-Sulfurized Slag Pit	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
26	Cupola Slag Pit	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
27	Slag Cooling Bin	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
28	Bottom Drop Sand Pit	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
29	Quench Cleanout/Spent Baghouse Bags Rolloffs	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water

Table IV.2 (Continued)

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring no further action at this time:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
30	West Side Drum Storage	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
31	Waste Paint Storage	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
32	Pit and Trench for # 1 Paint Machine	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
33	Pit and Trench for # 2 Paint Machine	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
34	Packaging Hydraulic Pit (West)	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
35	Packaging Hydraulic Pit (East)	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
36	Cement Lining Staging Area	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
37	Used Oil Storage Tank	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
38	Shot Blast	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
39	New Scrap Reclamation Area	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water
A	Outside Paint Storage Area	NFA per RFA dated, September 21, 2007	Soil, Ground Water, Surface Water

Table IV.3

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs regulated by Parts II and III of this permit.

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA
21	Landfill	Post-Closure Care Landfill	Soil, Ground Water, Surface Water

PART V

CORRECTIVE MEASURES IMPLEMENTATION

V.A. APPLICABILITY

The conditions of this Part apply to SWMUs and AOCs identified in Table V.1.

V.B. GENERAL CONDITIONS

1. The Permittee is required to perform corrective measures for the SWMUs and AOCs identified in Condition V.A. The approved remedy for these defined units, waterway areas, or land parcels, includes any and all actions set forth in this permit and in the approved Interim Measures Plans, Corrective Measures Studies (CMSs), and Corrective Measures Implementation (CMI) Plans approved by the Department, as noted below:

Applicable SWMU/AOC*	CMS/CMI	Approval Date

*There are no CMI activities required at this time

2. Remedial Cleanup Levels (RESERVED)

3. Groundwater Monitoring and Remediation

Where required pursuant to Conditions V.B.1. and V.C. of this permit, the Permittee shall comply with the general groundwater monitoring requirements of Part III of this permit.

4. Land Use Controls

Where required pursuant to Conditions V.B.1. and V.C. of this permit, the Permittee shall establish appropriate land use controls to achieve protection of human health and the environment. The Permittee shall comply with Conditions V.B.5. and V.B.6. of this permit when implementing corrective measures requiring land use controls. Where the owner of such property will not allow a deed restriction to be imposed, the Permittee shall notify the Department within 14 calendar days of receipt of written notification by the property owner. In such cases, the Department may allow the Permittee to propose an alternate area-specific land use control, subject to the Department's review and approval.

5. Survey Plat

For corrective measures where residual concentrations of contaminants will remain in-place at levels greater than those appropriate for unrestricted land use, or for corrective measures that rely on land use controls, the Permittee must:

a. Within 90 calendar days following the effective date of a permit modification addressing remedy selection, submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Department, a survey plat indicating the location and dimensions of the SWMUs, AOCs, and capped or partially remediated areas with respect to permanently surveyed benchmarks, the locations of sampling points, and the concentrations of hazardous constituents detected. This plat must be prepared and certified by a professional land surveyor registered in the State of Alabama. The plat must be filed with the local zoning authority or the authority with jurisdiction over local land use and must contain a note, prominently displayed, which states the Permittee's obligation to limit the property to the specified non-residential uses.

b. Maintain the survey plat as described in Condition V.B.5.a. of this permit and in the CMS Report until the Permittee has demonstrated, to the satisfaction of the Department, that the levels of hazardous constituents in all contaminated media are within limits appropriate for unrestricted residential land uses.

6. Notice to Title of Real Property

No later than the submission of the survey plat required in Condition VI.B.5., the Permittee must:

a. Record in the probate judges office of the county in which the property is located or a portion thereof a deed, restrictive covenant or some other instrument that is normally examined during a title search that will in perpetuity notify any potential purchaser of the property that:

i. The land is contaminated with hazardous constituents in concentrations that exceed residential standards;

ii. The use of the property is restricted by this permit for certain residential, municipal, or industrial purposes and may lead to an increased risk of exposure to hazardous constituents depending upon the activities initiated at the site. Such activities may yield an increased level of human health risk to the owner;

iii. iii. The potential purchaser or entity that desires to work in the contaminated area should notify the Permittee before mobilizing to the area covered by the institutional control.

b. Submit to the Department a certification, signed by the Permittee in accordance with Permit Condition I.C.11., that the notice specified in this part has been performed. This certification must include a copy of the document in which the notation has been placed.

c. Maintain the deed notice described in Permit Condition V.B.6. until the Permittee has demonstrated, to the satisfaction of the Department, that the levels of hazardous constituents in all contaminated media are within limits appropriate for unrestricted residential land uses.

7. Security

Security measures, where required by Conditions V.B.1. and V.C. of this permit, will be conducted in accordance with ADEM Admin. Code R. 335-14-5-.02(5) and as prescribed in the approved CMI Plan.

8. Inspection

Where corrective measures addressed in Conditions V.B.1. include provisions to cap in place or partially remediate properties or land areas, whether owned or not owned by the Permittee, the Permittee shall specify inspection protocols on a scheduled basis to ensure continued integrity of the remedy and to ensure that land use remains appropriately restricted per the deed notice established pursuant to Permit Condition V.B.6. Inspection provisions shall be as prescribed in the approved CMI Plan

V.C. AREA SPECIFIC CONDITIONS (RESERVED)

V.D. CORRECTIVE MEASURES IMPLEMENTATION (CMI) REPORTS

1. CMI Progress Reports

If the time required to complete implementation of a specific set of corrective measures, as described in the CMI Plan approved by the Department, is greater than 180 calendar days, the Permittee shall provide ADEM with progress reports according to the schedule approved by ADEM in the CMI Plan. The progress reports shall, at a minimum, contain the following information:

a. A description of the portion of CMI completed;

b. Summaries of and deviations from the approved CMI during the reporting period;

c. Summaries of current and potential problems, including recommended solutions and alternatives as well as corrective actions undertaken;

d. Any monitoring data (soil, air, dust, water) collected for any reason during the construction period for the purposes of monitoring potential for human and ecological exposure; and,

e. Projected work for the next period and impacts to the approved schedule.

2. Final CMI Reports

Upon completion of construction of corrective measures systems, implementation of land use controls, interim removal actions, or other short-term activities required by this permit and/or the approved CMI Plan, the Permittee shall submit to the Department a Final CMI Report containing, at a minimum, the following:

a. A description of activities completed;

b. For cap and cover remedies, as-built construction drawings presenting the final in-place three-dimensional location of contaminated material. A plan view of the remediated areas shall be presented in addition to a cross section of the in-place capped areas;

c. Hazardous waste manifests indicating the handling of any excavated material that has been shipped off-site to a Department-approved, certified landfill;

d. For remedies involving land use controls, a copy of the survey plat and notice to deed required by Condition V.B. of this permit;

e. Monitoring data (soil, air, dust, water) collected for any reason during the construction period for the purposes of monitoring potential for human and ecological exposure; and

f. Certification, prepared in accordance with ADEM Admin. Code Rule 335-14-8-02 (2)(d) by the Permittee and an independent professional engineer registered in the State of Alabama, that the corrective measures implementation phase (*i.e.*, construction) required by this permit is complete and that the approved system and/or facilities are ready for operation in accordance with the intended design (*i.e.,* CMI Plan).

3. Corrective Measures (CM) Effectiveness Reports

a. For corrective measures that have been fully implemented and where the corrective measures system must operate for a period of time to achieve cleanup goals or levels, the Permittee shall submit CM Effectiveness Reports on a semi-annual basis, unless otherwise approved by the Department, beginning 180 calendar days following the Department's approval of the Final CMI Report. The CM Effectiveness Reports shall include, at a minimum, the following:

i. A detailed narrative presenting an evaluation of the effectiveness of the selected remedy;

ii. Summaries of compliance with and progress toward achieving cleanup goals;

iii. Any significant revisions, adjustments, or proposed modifications to the selected remedy;

iv. Tabulated environmental sampling and monitoring data including, but not limited to, groundwater quality, elevation data, and a graphical representation of all constituents detected during each sampling event from recovery wells, monitoring wells, drinking water wells, and other locations;

v. Chain of custody, field reports, and laboratory data sheets to include the date of collection, the date the sample was extracted, and the date of sample analysis for samples collected during the reporting period;

vi. Any monitoring data (soil, air, dust, water) collected for any reason during the post-construction period for the purposes of monitoring potential for human and ecological exposure;

vii. Isoconcentration maps depicting the distribution of parameters for each sampling event;

viii. Time versus concentration plots for each monitoring parameter for each recovery well and a representative number of effectiveness wells;

ix. Tabulated volumetric data on groundwater pumped and pumping rates (monthly and cumulative) for each recovery well;

x. Records of any groundwater recovery system operation time, including shutdown periods, not including any minor (less than 24 hours) shutdowns for repairs, maintenance, etc.;

xi. Potentiometric surface maps;

xii. Description of land use during the reporting period at the designated area requiring corrective measures; and,

xiii. Findings of the Permittee's investigation into the continued effectiveness of institutional controls per Condition V.C.

b. If, at any time, the Permittee determines that any remedy selection specified in Condition V.B or V.C. of this permit no longer satisfies the applicable requirements of ADEM Admin. Code R. 335-14-5-.06(12) or this permit for releases of hazardous waste or hazardous constituents originating from SWMUs or AOCs, the Permittee must, within 90 calendar days, submit an application for a permit modification, pursuant to Permit Condition I.I, to make any appropriate changes to the CMI Plan.

c. The application for changes in the CMI Plan, including changes in inspection and monitoring provisions of the CMI Plan, shall be submitted as an application for a permit modification pursuant to the requirements of ADEM Admin. Code R. 335-14-8-.04.

4. Final Report of Corrective Measures

Within 90 calendar days following attainment of cleanup levels or goals as outlined in this Permit and the approved CMI Plan, the Permittee shall submit to the Department a Final Report of Corrective Measures (FRCM). The FRCM shall contain a certification by the Permittee and an independent professional engineer registered in the State of Alabama that all remedial measures required by this permit and the approved CMI Plan have been completed. The FRCM shall outline any procedures and schedules for dismantling of corrective measures systems, groundwater monitoring or recovery systems, removal of land use controls, and any other remedial systems or controls required by this permit or the approved CMI Plan.

Table V.1.

The following Solid Waste Management Unit(s) (SWMUs) and/or Area(s) of Concern (AOCs) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring Corrective Measures.

SWMU/AOC NUMBER*	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA

*There are no CMI activities required at this time

PART VI

SUMMARY OF DEADLINES

The summary information provided herein is intended only as a guide to the requirements of this permit. It is not intended to be all inclusive, nor is it intended to be used as a substitute for the full text of this permit.

PERMIT CONDITION	ITEM	DUE DATE
I.C.2.b.	Reapply for a renewal	180 calendar days from the expiration of the current permit.
I.C.12.	Give notice to the Department of any planned physical alterations or additions to the permitted facility and any solid waste management units.	As soon as possible
I.C.12.	Report any noncompliance with this permit that may endanger human health or the environment.	Orally within 24 hours from the time the Permittee becomes aware of the circumstances. Written submission shall also be provided within 5 calendar days of the time that the Permittee becomes aware of the circumstances
I.F.	Waste Minimization Certification	Annually
I.G.	Update cost estimates	No later than 30 calendar days after the Department has approved a modification to the Closure Plan, Post-Closure Plan, or Corrective Action Plan, or any other plan required or referenced by this permit, if the change in the plan results in an increase in the amount of the cost estimate and annually as required by ADEM Admin. Code Rules 335-14-5-.08(3)(b), (5)(b), and (10)(b)
I.I.	Submit a written request for a permit modification pursuant to the requirements of ADEM Admin. Code Rule 335-14-8-.04(2).	At least 60 calendar days prior to a proposed change in facility design or operation.
II.C.2	Inspect closed unit(s).	At least weekly, after storms, and in accordance with the inspection schedule.
III.B.1.a.iii.	Notification of damaged groundwater monitoring wells.	Immediately in writing. The well must be repaired within 30 calendar days of damage, and repair report must be submitted within 30 calendar days of repair.
III.B.1.d.	Install additional groundwater monitoring wells	As necessary to assess changes in the rate and extent of any plume of contamination, or as otherwise deemed necessary. Note: a permit modification request must be submitted within 90 calendar days prior to installation of additional groundwater monitoring well(s).

PERMIT CONDITION	ITEM	DUE DATE
III.B.2.a.	Determine groundwater surface elevation.	At least semi-annually and each time a well is sampled.
III.B.2.b.	Determine groundwater flow rate and direction.	At least annually.
III.B.6.b.	Submit groundwater monitoring report	Within 60 calendar days of the first sampling event and annually thereafter.
III.B.6.c.	Submit progress reports.	Within 90 calendar days after the effective date of this permit and quarterly thereafter. See permit condition for start/stop/resume provisions.
III.E.2.b.	Implement corrective action plan	No later than 120 calendar days after the effective date of this permit.
III.E.4.a.	Semi-annual corrective action effectiveness reports.	Within 60 calendar days of each semi-annual anniversary of this permit after corrective action is initiated, and until corrective action is completed.
IV.B.1.	Notify the Department, in writing, of the discovery of any additional AOCs	Within 15 calendar days of discovery
IV.B.2.	Notify the Department, in writing, of the discovery of any additional SWMUs	Within 15 calendar days of discovery
IV.B.3.	Submit a SWMU Assessment Report (SAR) for each SWMU identified under IV.B.2.	Within 90 calendar days of notification.
IV.C.1.	Notify the Department, in writing, of any newly discovered release(s) of hazardous waste or hazardous constituents from SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means.	Within 15 calendar days of discovery
IV.D.7.	Submit RFI progress reports.	Monthly beginning in the second month following the initiation of the RFI
IV.D.8.	Submit RFI Report	Within 60 calendar days from the completion of investigation activities.
IV.E.2.	Submit CMI Plan	Within 120 calendar days following the Permittee's submittal of the RFI Report indicating that hazardous constituents have come to be located at any area of the Permittee's facility, or beyond the facility, at concentrations exceeding those appropriate for the protection of human health and the environment, or within 120 days following notification from the Department that a CMI Plan is required, whichever occurs earlier.

PERMIT CONDITION	ITEM	DUE DATE
IV.E.4	Demonstrate financial assurance for completing the approved remedy.	Within 120 calendar days after this Permit has been modified in accordance with Permit Condition IV.E.2
IV.F.1.	Submit IM Work Plan	Within 30 calendar days upon notification by the Department.
IV.F.3.	Submit IM Report	Within 90 calendar days of completion of IM
V.B.5.a.	Submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Department, a survey plat indicating the location and dimensions of the SWMUs, AOCs, and capped or partially remediated areas with respect to permanently surveyed benchmarks, the locations of sampling points, and the concentrations of hazardous constituents detected	Within 90 calendar days following the effective date of a permit modification addressing remedy selection.
V.D.3.	Begin submitting semi-annual CM Effectiveness Reports	180 calendar days following the Department's approval of the Final CMI Report
V.D.4.	Submit a Final Report of Corrective Measures (FRCM)	Within 90 calendar days following attainment of cleanup levels or goals

March 21, 2018

Alabama Department of Environmental Management
Environmental Services Branch
Land Division
P.O. Box 301463
Montgomery, Alabama 36130-1463

Attn: Mr. Clethes Stallworth, Chief

Re: **Part B Permit Post Closure Care Renewal Application**
Mueller Property Holdings, LLC
Closed Landfill and Spay Pond
3000 30th Avenue North
Birmingham, Jefferson County, Alabama
USEPA Identification Number ALD 004 017 901
Terracon Project No. E1187001

Dear Mr. Stallworth:

Terracon Consultants, Inc. has prepared the enclosed *Renewal Application for Part B Post-Closure Permit* for the above-referenced site.

Two copies and an electronic copy on a cd of the application are enclosed. If you have any questions concerning this report or need additional information, please call me at (205) 942-1289

Sincerely,
Terracon Consultants, Inc.

Terrell W. Rippstein, AL-PG #8
Principal Geologist

Frank M. Nowicki
Senior Project Professional

Part B Post Closure Care Permit Renewal Application

MUELLER PROPERTY HOLDINGS, LLC

3000 30th Avenue North

Birmingham, Jefferson County, Alabama

USEPA ID. No: ALD 004 017 901

March 21, 2018

Project No. E1187001

Prepared for:
Mueller Property Holdings, LLC
Atlanta, GA

Prepared by:
Terracon Consultants, Inc.
Birmingham, AL

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Greg Hollod, PhD
VP EHS
July 10, 2018

March 21, 2018

Mueller Property Holdings, LLC
1200 Abernathy Road, Suite 1200
Atlanta, Georgia 30328

Attn: Dr. Greg Hollod
Vice President EHS

Re: **Part B Permit Renewal Application**
Mueller Property Holdings, LLC
3000 30th Avenue North
Closed Landfill and Spray Pond
Birmingham, Jefferson County, Alabama
USEPA Identification Number ALD 004 017 901
Terracon Project No. E1187001

Dear Dr. Hollod:

Terracon Consultants, Inc. has prepared the enclosed *Renewal Application for Part B Post-Closure Permit* for the above-referenced site.

Terracon appreciates the opportunity to work with you on this project. If you have any questions concerning this report, please call me at (205) 942-1289.

Sincerely,
Terracon Consultants, Inc.

Terrell W. Rippstein, AL-PG #8
Principal Geologist

Frank M. Nowicki
Senior Project Professional

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Part B Post-Closure Care Permit Renewal Application
Mueller Property Holdings, LLC
Closed Landfill and Spray Pond
Birmingham, Alabama
USEPA Identification Number ALD 004 017 901

1.0 GENERAL DESCRIPTION

As per Condition I.C.2 of AHWMMA Post-Closure Permit dated September 26, 2008 Modification 2, dated January 8, 2016, this renewal application for the Part B Post-Closure Permit is hereby submitted.

1.1 Proposed Action

This proposed action is filed by Mueller Property Holdings, LLC, Birmingham, Alabama. It addresses the criteria required for renewal of the application for a Part B permit under the guidelines of 40 CFR 270 and Rule 335-14-8-.02(5) of the State of Alabama Administrative Codes for the use of an on-site landfill. This landfill was used for the disposal of general foundry waste which, at one time, included the disposal of untreated cupola baghouse dust. Untreated baghouse dust has not been placed in the landfill since 1988.

A complete Part A form addressing the information required by Rule 335-14-8-.02(4) is included as Appendix A.

1.2 General Description of the Facility

The Mueller Property Holdings, LLC facility is located at 3000 30th Avenue North, Birmingham, Alabama. The entire property occupies approximately 63 acres; however, Mueller Property Holdings, LLC has subdivided the Landfill and Spray Pond property from the remainder of the property. The Landfill and Spray Pond parcel and the surrounding area are shown on the following figures:

Figure 1 - Site Location Map
Figure 2 - Topographic Map
Figure 3 - Site Map
Figure 4 - Flood Insurance Rate Map
Figure 5 - Site Aerial Photograph

These maps contain information required to comply with Rule 335-14-8-.02(5)(b)19.

The new subdivided parcel includes SWMU 21 – Closed Landfill and SWMU 22 – Spray Pond, plus closed SWMUs 14, 15, 16, and 17. All of the other SWMUs were closed when the facility was razed and are located on adjacent parcels of land.

The Mueller Property Holdings, LLC facility was formerly a ductile iron foundry involved in the casting and sale of water piping and associated materials. The facility was in operation from approximately 1905 and was closed in April 2010. The only SWMUs remaining at the facility are a spray pond and a closed landfill formerly used for disposition of solid foundry waste. The estimated volume of the landfill is approximately 78,000 cubic yards or 93,600 tons.

The Plant formerly used a cupola in its melting operation to produce ductile iron for pipe making. A variety of scrap was used in the process. This raw material was closely screened to minimize levels of unwanted heavy metal contaminants (i.e., lead, cadmium, chromium, etc.). Approximately 15 tons of fine particulate material, termed cupola "baghouse dust", were generated per day of melting operation when the facility was active.

Prior to 1988, the practice at the North Birmingham Pipe Plant landfill was to mix the untreated baghouse dust with the general foundry waste materials on a daily basis as they were produced. The materials were then placed on the landfill with heavy equipment. From 1988 until the plant closed in 2010, the baghouse dust was treated (stabilized) with a reagent which rendered the dust nonhazardous, and it was then disposed of off-site.

1.3 Facility Location Information

The facility is located on the northern edge of the Birmingham city limits. Specifically, the facility lies in the western ½ of the northwest ¼ of the southwest ¼ of Section 13, Township 17 South, Range 3 West of the *Birmingham North*, United States Geological Survey (USGS) topographic quadrangle. A topographic map of the facility and surrounding area is provided as Figure 1.

SWMU 21 - Closed Landfill is located on the eastern portion of the facility property (Figure 2). The closed landfill occupies approximately 7 acres with topographic relief ranging up to 30 feet. The surrounding facility property is almost level with a low relief. Figure 3 shows the monitoring wells present at the site.

1.4 Contingency Plan

There are currently no employees or buildings on the site; therefore, a contingency plan is not required.

1.5 Seismic Standard Information

The site is located in Jefferson County, Alabama. Appendix VI of 40 Code of Federal Regulations (CFR) 264, which specifies potential seismic problem areas, does not list Jefferson County as a potential seismic problem area. Based on 40 CFR 270.14(b)(11)(i), no further information is required to demonstrate compliance with seismic standard 40 CFR 264.18(a).

1.6 Flood plain information

Village Creek is located approximately 0.75 miles to the south of the site and generally flows to the southwest. The flood studies for Village Creek by the Federal Insurance Administration of the Federal Emergency Management Agency (FEMA) indicate the North Birmingham Pipe Plant lies in Zone X, which are areas that lie outside the 500-year flood plain Figure 4.

1.7 Security Procedures and Equipment

Access to the spray pond and the closed landfill property is restricted from the surrounding area by locked fences. These fences provide security for these areas.

2.0 POST CLOSURE PLAN

2.1 General Information

The post-closure care plan for the Closed Landfill provides for maintenance and complies with other applicable requirements of the applicable regulations. The post-closure care will comply with ADEM Code R. 335-14-5 and 335-14-8. This care consists of maintaining the integrity and effectiveness of the final cover (including making repairs to the cover as necessary), maintaining an adequate grass cover, protecting and maintaining surveyed benchmarks and warning signs, and conducting required groundwater monitoring.

2.2 Inspection Schedule

Mueller Property Holdings, LLC provides monitoring and maintenance of the landfill cover throughout the post-closure care period. At a minimum, monitoring consists of regular inspections of the landfill for structural deterioration and discharges that could cause or enable the release of hazardous waste constituents and adversely affect the environment or threaten human health. The schedule of monitoring and maintenance is presented in Appendix B.

2.3 General Design Considerations

The original landfill surface has been reconfigured through grading, backfilling, and then capping with non-hazardous material to achieve stable slopes, a nearly flat top, and a cap. A grass cover has been established over the cap to prevent erosion. Capping and grassing of the landfill has eliminated the problem of wind blown particulate matter.

2.4 Liner System and Leachate Collection and Removal System

Installation of a liner system and leachate collection and removal system is not applicable for this landfill. For the design of the closure cover, the permeability of the natural soils was compared to the permeability of the closure cover. From this comparison it was determined that the permeability of the closure cover would be less than the natural soils. Therefore, it was concluded that neither system was necessary.

2.5 Run-on Run-off Control System

As part of the closure activities at the landfill, a berm was constructed around the base of the landfill to protect the landfill from run-on. Also, the landfill is located at a higher elevation than the surrounding land surface, thereby making the threat of run-on improbable (Figure 2).

Surface run-off from the landfill is controlled by water diversions and berms (Figure 2). The surface area of the landfill is approximately seven acres, and has been so constructed to drain uniformly toward the outer perimeter. The berm surrounding the landfill was designed to control storm water run-off for a 24-hour, 25-year storm event according to the previous information provided by Environmental Management and Engineering, Inc. during the initial permit application. In Jefferson County, this is equivalent to 7 inches of rain in 24 hours. Run-off calculations are included in Appendix D.

The berms will be routinely maintained to ensure that adequate run-on/run-off controls are in good condition.

2.6 Vegetative Cover

To prevent erosion, a vegetative cover has been established on the berms, slopes, and crown of the landfill. Prior to grassing the landfill, soil/waste samples were collected and composited into a single sample. This sample was then sent to the soils laboratory located at Auburn University for the appropriate analysis to determine recommended soil amendments. After application of the proper amounts of soil amendments, the berms, slopes, and crown of the landfill were planted with a mixture of rye, bermuda grass, and legumes. The surface of the landfill was then mulched with hay to hold the seed in place and prevent erosion. On some slopes, erosion netting was

applied to hold the mulch in place. The vegetative cover is cut and fertilized as necessary to maintain healthy growth.

2.7 Groundwater Monitoring Plan

Corrective action groundwater monitoring is presently ongoing at the North Birmingham Pipe Plant. The Corrective Action Program is included as Appendix D. The Sampling and Analysis Plan is included as Appendix E.

Some monitoring wells have barricades in place to protect them from being damaged. Each well is marked and has a locking cap to prevent unauthorized access. Inspection of the wells is a part of the regular inspection program.

2.8 Post-Closure Land Use

During the post-closure period, the landfill and spray pond will remain closed, and access will be controlled by a fence and locked gates.

Routine maintenance to repair possible erosion of cap material on the top and slopes of the landfill will be performed as warranted (to be determined during the regularly scheduled inspections).

2.9 Specific Post-Closure Plan Requirements

2.9.1 Surface Impoundment

There are no hazardous waste surface impoundments at the Mueller Property Holdings, LLC property; therefore, this section is not applicable for the Post-Closure Plan.

2.9.2 Waste Pile

This Post-Closure Plan is for a landfill at the Mueller Property Holdings, LLC property. No waste piles are present at this site. Therefore, this section is not applicable to the Post-Closure Plan.

2.9.3 Landfill

The post-closure landfill procedures consist of a maintenance program that will ensure the integrity of the landfill cap, vegetative cover, and run-off control structures. Maintenance of the landfill site will be carried out by conducting periodic inspections to note any erosion damage, the condition of vegetative cover, the integrity of safety and run-off control structures, and subsequently perform any repairs. A discussion of the inspection and maintenance program is presented in Appendix B.

2.9.4 Land Treatment Facility

There are no existing or proposed land treatment facilities at the Mueller Property Holdings, LLC property, and this section is not applicable to the Post-Closure Plan.

2.10 Preparedness and Prevention Requirements

Mueller Property Holdings, LLC wishes to request a waiver of the preparedness and prevention requirement under 40 CFR 264 Subpart C and ADEM Administrative Code R.335-14-5-.03.

There are no buildings or personnel onsite. Due to the inert characteristics of cupola baghouse dust and general foundry waste, special requirements for fire control, emergency communications, or special arrangements with local authorities are unnecessary for the closed landfill. The landfill is fenced and secured; therefore, no alarms or telephones are needed.

2.11 Traffic and Vehicle Information

Up to the time of closure, foundry wastes, including treated (stabilized) baghouse dust, were transported to the landfill in trucks. Disposal of untreated baghouse dust was discontinued in 1988, when the facility began using "a totally enclosed treatment facility," per ADEM Administrative Code 335-14-1-.02(1). Because the treated dust was no longer classified as hazardous**,** the disposal of hazardous materials in the landfill was effectively ended. Upon completion of closure activities in 1988, transportation of all materials onto the closed landfill was discontinued.

2.12 Notices Required for Disposal Facilities

2.12.1 Notice to Local Zoning Authority

A survey plat indicating the type, location, and quantity of hazardous waste within the disposal area with respect to permanently surveyed benchmarks was submitted to the City of Birmingham Zoning Board of Adjustments on December 10, 1991. The zoning board returned an officially received and stamped landfill plat to U.S. Pipe on December 18, 1991.

2.12.2 Notice in Deed to Property

On January 6, 1992, a "Declaration of Restriction" was filed by U.S. Pipe with the Jefferson County Probate Court at the Birmingham City Courthouse for the closed landfill. The "Declaration of Restriction" will serve to notify any potential purchaser that:

- the property has been used to manage hazardous waste; and

- use of the land is restricted to activities that will not disturb the integrity of the final cover system or monitoring system during the post closure care period.

2.12.3 Notice of Certification of Post-Closure Care

Mueller Property Holdings, LLC will notify ADEM within 60 days after completion of the established 30-year post-closure care period.

2.13 Estimated Post-Closure Costs

Appendix F outlines the estimated post closure costs to be incurred for the waste management area. These estimates were prepared in accordance with ADEM Administrative Code R.335-14-5-.08(5) and include provisions for; third party costs, labor rates, inspection costs, and administrative costs.

2.14 Financial Assurance Mechanism for Post-Closure

To meet the requirements of 40 CFR 265.145 and ADEM Administrative Code R.335-14-5.08(6), Financial Assurance for Post-Closure, Mueller Property Holdings, LLC has provided a letter of credit with a standby trust fund. Documentation is presented in Appendix G.

3.0 III. GROUNDWATER MONITORING PROGRAM

3.1 A. General Information

Twenty-five monitoring wells are presently located on the site (Figure 3). These monitoring wells are constructed of 2-inch-I.D. PVC and are designated MW-1R, MW-2R, MW-2BR, MW-2C, MW-3R, MW-5R, MW-6 through MW-17, MW-8B, MW-8C, MW-9B, and TW-1 through TW-4.

Groundwater sampling for this facility commenced in the spring of 1989. The site has been in Corrective Action Monitoring since March 2005. A description of the Corrective Action Program is included as Appendix D.

3.2 Soils and Geology

The North Birmingham Pipe Plant is located in the Birmingham-Big Canoe Valley physiographic district of the Alabama Valley and Ridge physiographic section (Planert and Pritchett, 1989). The facility is underlain by the Conasauga Formation of the Cambrian System (Figure 6). The Conasauga Formation is composed of dark to brownish-gray, sublithographic, medium- to thin-bedded limestone and light olive to medium gray shale. In the Birmingham Valley, the Conasauga Formation is 1,100 to 1,900 feet thick (Szabo and others, 1979). In the area of the facility, the depth to bedrock ranges from approximately 6 to 20 feet below land surface (bls). The dip is to the south-southeast at approximately 20 degrees.

The soils at the North Birmingham Pipe Plant consist of various types of soil and fill material brought in to develop this area. The native soils in this area are typically formed as limestone bedrock weathers to a loamy-clay residuum. The soils around the landfill have been identified by the U.S. Soil Conservation Service (SCS) as belonging to the Tupelo Series.

A geologic cross-section previously presented in the initial Part B Permit Application is included as Figure 7.

3.3 Hydrogeology

The major regional aquifer is the Knox-Shady Aquifer (Planert and Pritchett, 1989). Although the Knox-Shady Aquifer comprises rock units of the Knox Group, Ketona Dolomite, Conasauga Formation, Shady Dolomite, and Weisner Quartzite, immediately beneath the facility, the Conasauga Formation is present.

There are potentially three zones of groundwater movement beneath the site; these zones occur within the fill/soil (shallow flow zone), the soil-bedrock interface (intermediate flow zone), and the bedrock (bedrock flow zone). Due to the heterogeneous and anisotropic nature of area soils and bedrock, the rate and direction of groundwater flow varies from one zone to another, as well as within each zone. However, the three flow zones are believed to be in hydraulic communication for at least some portion of the year.

In the shallow flow zone, where present, groundwater travels along pathways of primary porosity, within the interstitial voids between the individual grains of sand, silt and clay in the soil. Groundwater in this zone also travels through macropores created by roots and organisms. The clay-rich native soil beneath the fill may retard or locally prevent the downward movement of water, resulting in discontinuous and impermanent perched water bodies. The is essentially no horizontal flow through the shallow flow zone,

Groundwater that has percolated through the shallow flow zone and from any perched water body within the shallow flow zone may eventually encounter the intermediate flow zone (the predominant zone of interest for this site). In the intermediate flow zone, groundwater travels

along the highly irregular and weathered surface of the underlying carbonate bedrock. The direction and rate of groundwater movement in this zone is also controlled by the presence of solution openings and/or solution-enlarged joints and bedding planes near the top of the bedrock. Data previously submitted to the Department indicates semi-confined to confined conditions, most likely created by the presence of clayey soils acting as a confining unit or aquitard above the weathered top-of-rock zone.

Groundwater in the intermediate flow zone may eventually gain entry into the deeper, relatively unweathered bedrock flow zone. In the predominantly carbonate bedrock, groundwater travels through pathways of secondary porosity such as solution cavities and solution-enlarged joints and bedding planes, as well as along the contacts between individual limestone and shale units.

Figure 8 is the potentiometric surface map for the most recent (September 2017) groundwater monitoring event and illustrates intermediate flow zone. A potentiometric Surface Map for the groundwater flow in the intermediate flow zone prior to start-up of the corrective action system is included as Figure D-3 in Appendix D.

An aquifer test was conducted during the Final Additional Assessment Report, dated March 20, 2002, which was previously submitted to the Department. This report includes aquifer parameters measured during the pumping test and include transmissivity (T, 0.1468 ft^2/min) and storage coefficient (S, 0.001402). In addition, the aquifer hydraulic conductivity for the site was determined by dividing the transmissivity by the aquifer thickness. Therefore, the aquifer hydraulic conductivity is 0.0012 ft/min (6.1 x 10^{-4} cm/sec).

3.4 Groundwater Monitoring Data

The groundwater monitoring data collected since December 1997 under the current Part B Post-Closure Permit is included as Appendix H.

3.5 Contaminant Plume Description

Groundwater Monitoring has been conducted under the current Part B Post Closure Permit since December 1997. The figures illustrating the constituents exceeding the groundwater protection standards (GWPS) from the September 2017 semi-annual groundwater sampling events are presented as Figure 9.

The current contaminant plume on the site consists of volatile organic compound (VOCs) concentrated in the area of the monitoring wells MW-2R, MW-2B, and MW-2CR. Corrective action is currently being conducted at the site. The Corrective Action Program is presented in Appendix D.

3.6 General Monitoring Program Requirements

The regulated hazardous waste landfill unit has been closed (*Landfill Closure Certification - U.S. Pipe and Foundry Company, North Birmingham Pipe Plant*, Environmental Management & Engineering, Inc., October 27, 1993, revised). As a result, there will be no significant leaching of any contained materials by the infiltration of precipitation on the landfill during the post-closure period. The post-closure program to monitor the regulated unit is described below.

3.6.1 Description of Wells

Twenty-five monitoring wells are presently located on the site (Figure 3). These monitoring wells are constructed of 2-inch-I.D. PVC and are designated MW-1R, MW-2R, MW-2BR, MW-2C, MW-3R, MW-5R, MW-6 through MW-17, MW-8B, MW-8C, MW-9B, and TW-1 through TW-4. The monitoring wells have been surveyed and mapped.

Monitoring well information including well type, latitude, longitude, well depth, ground surface elevation, top of casing elevation, screened interval, and monitoring zone/aquifer is presented in Table D-3 in Appendix D. Boring logs and well schematics are included in Appendix A-D of Appendix D.

3.6.2 Description of Sampling/Analysis Procedures

The site is currently under Corrective Action Monitoring. The Corrective Action Program is included in Appendix D and the Sampling and Analysis Plan is included as Appendix E.

If it is determined that the site can move into compliance or detection monitoring, an application for permit modification will be submitted to outline the appropriate monitoring program.

3.6.3 Procedures for Establishing Background Quality

Monitoring well MW-5R is the background monitoring well for the post-closure period. The data will be evaluated according to statistical procedures to obtain a comparison database for the other, downgradient monitoring wells. Groundwater quality for the background well will be updated and reported as required in Appendix D. Quality assurance/quality control sample data will be obtained semi-annually and provided to ADEM in the groundwater monitoring reports.

3.6.4 Statistical Procedures

Corrective action monitoring is currently being conducted at the site. The statistical analysis being conducted during corrective action monitoring is discussed in Appendix D.

3.7 Description of Corrective Action Monitoring Program

The Corrective Action Monitoring Program is included as Appendix D.

3.8 List of Indicator Parameters, Waste Constituents, Reaction Products to be Monitored

Under the current Part B Post-Closure Care Permit, the background, point of compliance, and effectiveness monitoring wells are sampled and analyzed for the constituents presented in Table III.2. of the current Part B Post Closure Permit (Appendix I) during the September semi-annual sampling event. In addition, the background, point of compliance, effectiveness, and boundary monitoring wells are sampled and analyzed for the constituents presented in Table III.3. of the current Part B Post Closure Permit (Appendix J) during the March semi-annual sampling event. The constituents proposed in Appendix K are the constituents of the subset of Tables III.2 and III.3 that are proposed for both sampling events (March and September) during this permit period for Corrective Action Monitoring. The constituents which were not detected during the last 10 years were removed from current Table III.2 and Table III.3. Appendix K also shows the proposed Groundwater Protection Standards for these constituents. If the site moves to Compliance or Detection Monitoring in the future, then a permit modification will be requested and the longer list of constituents (Permit Table III.3 or Appendix IX) will be proposed.

If it is determined that the site can move into compliance or detection monitoring, an application for permit modification will be submitted to outline the appropriate monitoring program and constituents.

4.0 RECORD KEEPING AND REPORTING

Records of the analyses for groundwater performed and records of the groundwater surface elevations will be maintained throughout the life of the waste management unit and throughout the post-closure care period as well.

The description of the Corrective Action Program and the reporting requirements is described in Appendix D.

5.0 RELEASE MANAGEMENT PROGRAM

5.1 Detection Monitoring Program

This section is reserved until Corrective Action Monitoring has been completed per the Department's requirements. U.S. Pipe, in consultation with the Department, will then submit an *Application for Post-Closure Permit Modification* as appropriate.

5.2 Compliance Monitoring Program

This section is reserved until Corrective Action Monitoring has been completed per the Department's requirements. U.S. Pipe, in consultation with the Department, will then submit an *Application for Post-Closure Permit Modification* as appropriate.

5.3 Corrective Action Program

The Corrective Action Program is included as Appendix D.

6.0 OTHER UNITS

The location of the SWMUs and AOC described below and on Table 1 are shown on Figure 10.

6.1 A. Area of Concern (AOC)

The AOC A – Outside Paint Storage Area listed in Appendix A-3 of the current Part B Post-Closure Care Permit was investigated. Corrective Measures were implemented in AOC A and received a no further action at this time status. This unit is closed and is no longer in the Permit property boundary.

6.2 B. Solid Waste management Units (SWMUs)

The SWMUs found during the previously submitted RCRA Facility Assessment (RFA) and listed in Appendices A-2 and A-3 of the current Part B Post-Closure Care Permit either required no further action or no confirmatory sampling.

These SWMUs are:

- 22 Spray Pond

This SWMU was not found to need additional sampling

The following SWMUs were located on the subject parcel. They have been investigated, remediated, or do not require additional sampling.

- 14 Scalping Basin
- 15 Scalping Basin
- 16 Primary Treatment Pond
- 17 Secondary Treatment Pond

The following SWMUs have been closed. They have been investigated, remediated, or do not require additional sampling. In addition, they are no longer on the same parcel or owned by Mueller Property Holdings, LLC.

- 1 Raw Material Storage Area
- 2 Raw Material Storage Piles
- 3 Emission Control System Afterburner
- 4 Heat Exchangers
- 5 Heat Exchangers
- 6 Emission Control System Quench Tank
- 7 Cupola Baghouse
- 8 Baghouse Dust Treatment System
- 9 Basement
- 10 Scrap Reclaiming Area
- 11 Ductile Baghouse
- 12 Cement Lining Settling Basin
- 13 Cement Lining Settling Basin
- 18 Used Oil Accumulation Area
- 19 Used Oil Storage Tank
- 20 Empty Drum Storage Area
- 23 Core Mold Containers
- 24 Asphalt Coating Spill Area
- 25 De-Sulfurized Slag Pit
- 26 Cupola Slag Pit
- 27 Slag Cooling Bin
- 28 Bottom Drop Sand Pit
- 29 Quench Cleanout/Spent Baghouse Bags Rolloff
- 30 West Side Drum Storage
- 31 Waste Paint Storage
- 32 Pit and Trench for Paint Machine #1
- 33 Pit and Trench for Paint Machine #2
- 34 Packaging Hydraulic Pit (West)
- 35 Packaging Hydraulic Pit (East)
- 36 Cement Lining Staging Area
- 37 Used Oil Storage Tank

- 38 Shot Blast
- 39 New Scrap Reclamation Area

TABLES

Table 1. SWMU and AOC Information
Mueller Property Holdings, LLC - Birmingham, Alabama

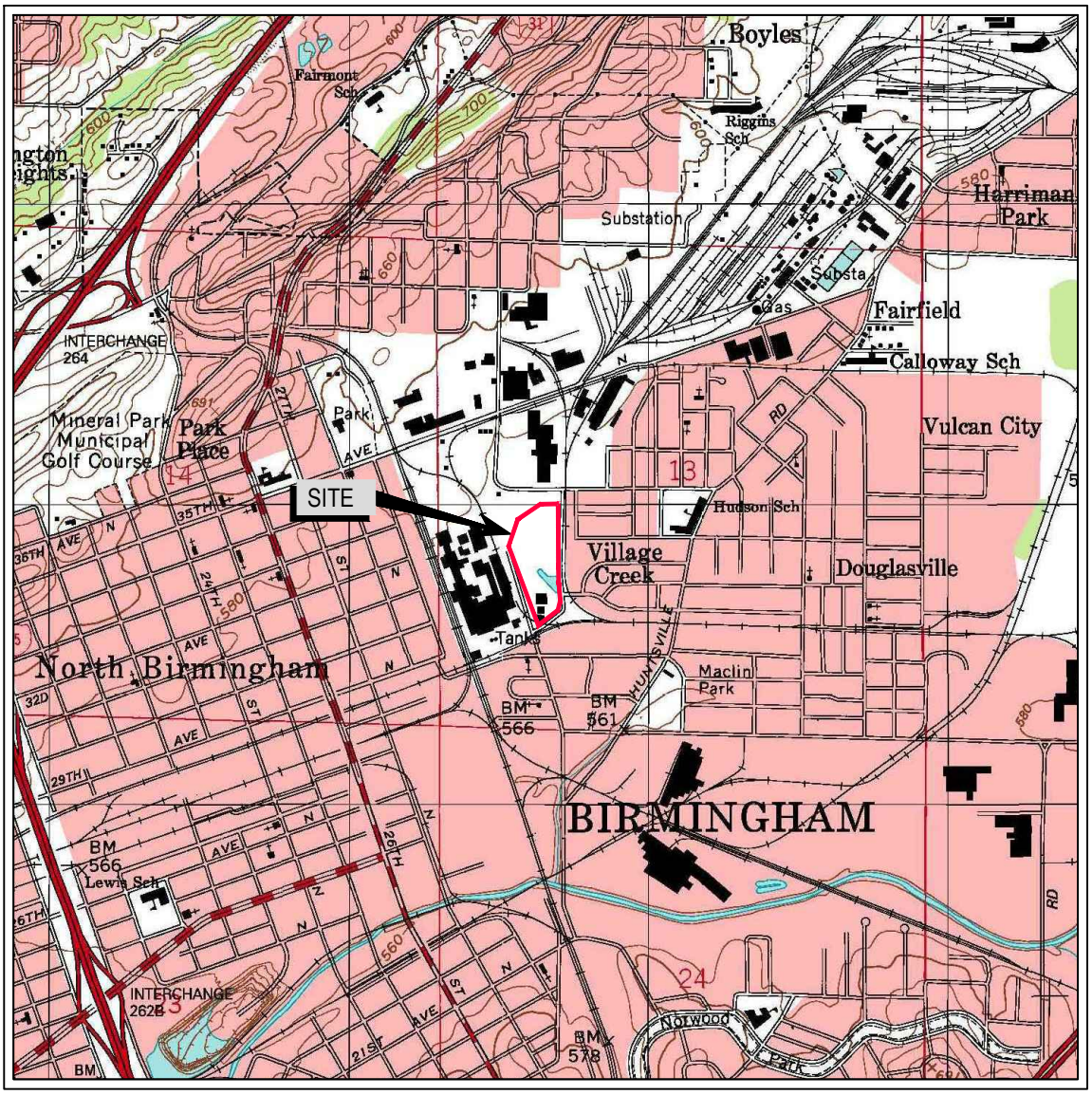
SWMU/AOC	Previously Identified / Still Present?	Date Unit Began Operating	Date Unit Operations Ceased	Dimension of Unit	Waste Handled	Unit Function
SWMU 1 - Raw Material Storage Area	Yes/No	pre 1980	2010	50'x20'	Raw Materials	Raw Material Staging
SWMU 2 - Raw Material Storage Piles	Yes/No	pre 1980	2010	800' x 300'	scrap iron	Raw Material Staging
SWMU 3 through 6 - Emission Controls	Yes/No	pre 1980	2010	120' x 30'	emmision dust	Air Pollution Control
SWMU 7 - Cupola Baghouse	Yes/No	pre 1980	2010	Included in SWMU 3-6	emmision dust	Air Pollution Control
SWMU 8 - Solofix Mixer	Yes/No	pre 1980	2010	Included in SWMU 3-6	emmision dust	Air Pollution Control
SWMU 9 - Basement	Yes/No	pre 1980	2010	200' x 60'	slag and sand	Excess Slag/Iron/Sand
SWMU 10 - Scrap Reclaimation Area	Yes/No	pre 1980	2010	120' x 60'	slag and scrap iron	Excess Slag/Iron/Sand
SWMU 11 - Ductile Baghouse	Yes/No	pre 1980	2010	20' x 60'	emmision dust	Air Pollution Control
SWMU 12 and 13 - Cement Lining Settling Basins	Yes/No	pre 1980	2010	20' x 40'	cement	Cement Settling
SWMU 14 and 15 - Scalping Basins	Yes/No	pre 1980	2010	60' x 30'	process water with sediment	Wastewater Settling
SWMU 16 and 17 - Primary and Secondary Treatment Ponds	Yes/No	pre 1980	2010	240' x 130'	process water with sediment	Wastewater Settling
SWMU 18 - Waste Oil Accumulation Area	Yes/No	pre 1980	2010	NA	waste oil	NA
SWMU 19 - Waste Oil StorageTank	Yes/No	pre 1980	2010	NA	waste oil	NA
SWMU 20 - Empty Drum Storage Area	Yes/No	pre 1980	2010	40' x 5'	empty drums	Empty Drum Storage
SWMU 21 - Landfill	Yes/Yes	pre 1980	post-closure	7 acres	closed	Closed Landfill
SWMU 22 - Spray Pond	Yes/Yes	pre 1980	operational	140' x 110'	non-contact cooling water	Process Water Cooling
SWMU 23 - Core Mold Containers	Yes/No	pre 1980	2010	7 (6' x 3') containers	spent sand molds	Collect Spent Cores
SWMU 24 - Asphalt Coating Spill Area	Yes/No	8/16/2006	7/2/1905	120' x 60'	Asphalt Coating	NA
SWMU 25 - De-Sulfurized Slag Pit	Yes/No	pre 1980	2010	60' x 10'	iron slag	Hot Slag Containment
SWMU 26 - Cupola Slag Pit	Yes/No	pre 1980	2010	60' x 10'	iron slag	Hot Slag Containment
SWMU 27 - Slag Cooling Bin	Yes/No	2001	2010	20' x 15'	iron slag	Hot Slag Cooling
SWMU 28 - Bottom Drop Sand Pit	Yes/No	pre 1980	2010	20' x 15'	bottom drop sand	Cupola Cleanout/rework
SWMU 29 - Quench Cleanout/Spent Baghouse Bags Rolloffs	Yes/No	1980	2010	72 (6' x 20') roll-offs	untreated baghouse dust and bags	Air Pollution Control
SWMU 30 - West Side Drum Storage	Yes/No	1990	2010	30' x 30'	nonhazardous waste	Empty Drum Storage
SWMU 31 - Waste Paint Storage	Yes/No	1995	2010	60' x60'	hazardous and nonhazardous waste & solvent for recycling	Drum Storage
SWMU 32 - Pit and Trench for #1 Paint Machine	Yes/No	pre 1980	2010	20' x6'	used asphalt coating and buoyant B special	Asphalt Coating
SWMU 33 - Pit and Trench for #2 Paint Machine	Yes/No	pre 1980	2010	20' x6'	used asphalt coating and buoyant B special	Asphalt Coating
SWMU 34 - Packageing Hydraulic Pit (West)	Yes/No	1990	2010	50' x 20'	hydraulic oil/soluable oil and water	Packaging
SWMU 35 - Packageing Hydraulic Pit (East)	Yes/No	1990	2010	50' x 20'	hydraulic oil/soluable oil and water	Packaging
SWMU 36 - Cement Lining Staging Area	Yes/No	pre 1980	2010	100' x 120'	cement	Staging Area
SWMU 37 - Used Oil Storage Tank	Yes/No	1985	2010	500-gallon AST	used oil	Idle
SWMU 38 - Shot Blast	Yes/No	2001	2010	40' x 30'	spent shot blast	Misc. parts cleaning
SWMU 39 - New Scrap Reclaimation Area	Yes/No	2000	2010	40' x 100'	slag and scrap iron	Excess Slag/Iron/Sand
AOC A - Outside Paint Storage Area	Yes/No	pre 1980	2010	40' x 30'	Asphalt Coating	Storage of Asphalt Coating

Table 1. SWMU and AOC Information
Mueller Property Holdings, LLC - Birmingham, Alabama

SWMU/AOC	Source and Destination of Waste Handled	Volumes of Waste Handled	Release Controls	History of Releases	Previous Investigation Activities
SWMU 1 - Raw Material Storage Area	NA	NA	None	No	CS Sampling Performed
SWMU 2 - Raw Material Storage Piles	NA	NA	None	No	CS Sampling Performed
SWMU 3 through 6 - Emission Controls	Bessie Mine Landfill	720 tons/year	Enclosed system	No	None Required
SWMU 7 - Cupola Baghouse	Quench Clean-out & baghouse bags/Emelle Landfill	20 tons/month	Baghouse bags	No	None Required
SWMU 8 - Solofix Mixer	Treated Baghouse dust/Bessie Mine Landfill	15 tons/day	Enclosed system	No	None Required
SWMU 9 - Basement	Casting Machine Waste & Iron Overpour/scrap reclaimation area	2 tons/day	Concrete Lined	No	CS Sampling Performed
SWMU 10 - Scrap Reclaimation Area	Scrap from basement/Bessie Mine Landfill	1 ton/day	None	No	CS Sampling Performed
SWMU 11 - Ductile Baghouse	Emissions from ductile treatment/Bessie Mine Landfill	360 tons/month	Baghouse bags	No	None Required
SWMU 12 and 13 - Cement Lining Settling Basins	Cement lining of pipe/Bessie Mine Landfill	3200 tons/year	Concrete Lined	No	CS Sampling Performed
SWMU 14 and 15 - Scalping Basins	All plant wastewater streams/Bessie Mine Landfill	3200 tons/year	Concrete Lined	No	CS Sampling Performed
SWMU 16 and 17 - Primary and Secondary Treatment Ponds	All plant wastewater streams/Bessie Mine Landfill	3200 tons/year	none	No	CS Sampling Performed
SWMU 18 - Waste Oil Accumulation Area	NA	NA	not present	No	None Required
SWMU 19 - Waste Oil StorageTank	NA	NA	not present	No	None Required
SWMU 20 - Empty Drum Storage Area	NA	NA	None	No	None Required
SWMU 21 - Landfill	NA	NA	Closed and capped	Yes, Corrective Action underway	Corrective Action
SWMU 22 - Spray Pond	NA	NA	Concrete Lined	No	None Required
SWMU 23 - Core Mold Containers	Pipe core molds/Bessie Mine Landfill	NA	None	No	None Required
SWMU 24 - Asphalt Coating Spill Area	NA	NA	None	Yes, 8/16/06	Investigation in progress
SWMU 25 - De-Sulfurized Slag Pit	Cupola Slag/Bessie Mine Landfill	50 tons/day	Earthen bern	No	none
SWMU 26 - Cupola Slag Pit	Cupola Slag/Bessie Mine Landfill	50 tons/day	Earthen bern	No	none
SWMU 27 - Slag Cooling Bin	Cupola Slag/Bessie Mine Landfill	50 tons/day	none	No	none
SWMU 28 - Bottom Drop Sand Pit	Cupola Refractory/Bessie Mine Landfill	50 tons/week	none	No	none
SWMU 29 - Quench Cleanout/Spent Baghouse Bags Rolloffs	Cupola Final Quench - cupola Baghouse/Emelle Landfill	20 tons/month	Covered Rolloffs	No	none
SWMU 30 - West Side Drum Storage	NA	NA	Secondary Containment	No	none
SWMU 31 - Waste Paint Storage	Overspray from paint machine/ Clearview, MS Landfill	35 tons/month	Secondary Containment	No	none
SWMU 32 - Pit and Trench for #1 Paint Machine	Overspray from paint machine/ Clearview, MS Landfill	35 tons/month	Concrete Lined	No	none
SWMU 33 - Pit and Trench for #2 Paint Machine	Overspray from paint machine/ Clearview, MS Landfill	35 tons/month	Concrete Lined	No	none
SWMU 34 - Packageing Hydraulic Pit (West)	Packaging process/Bessie Mine Landfill	NA	Concrete Lined	No	none
SWMU 35 - Packageing Hydraulic Pit (East)	Packaging process/Bessie Mine Landfill	NA	Concrete Lined	No	none
SWMU 36 - Cement Lining Staging Area	Cement lining waste and pond cleanout/Bessie Mine Landfill	9600 tons/year	Earthen berm	No	none
SWMU 37 - Used Oil Storage Tank	NA	NA	Secondary Containment	No	none
SWMU 38 - Shot Blast	NA	NA	None	No	none
SWMU 39 - New Scrap Reclaimation Area	Scrap from basement/Bessie Mine Landfill	1 ton/day	None	No	CS Sampling Performed
AOC A - Outside Paint Storage Area	NA	NA	Secondary Containment	Yes, Corrective Measures Implemented	CMI Complete

FIGURES

UNITED STATES – DEPARTMENT OF THE INTERIOR – GEOLOGICAL SURVEY



SCALE 1:24 000

1 .5 0 KILOMETERS 1 2

1000 0 METERS 1000 2000

1 .5 0 1

MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10 000

FEET

CONTOUR INTERVAL 20 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

QUADRANGLE

BIRMINGHAM NRTH, AL

1997

7.5 MINUTE SERIES (TOPOGRAPHIC)

*INDICATES WHICH MAP SITE IS LOCATED ON

Project Mngr: TWR	Project No. E1187001	Terracon Consulting Engineers and Scientists	TOPOGRAPHIC VICINITY MAP
Drawn By: RLW	Scale: AS SHOWN	110 12th Street North Birmingham, Alabama 35203	PART B PERMIT RENEWAL APPLICATION
Checked By: TWR/MRF	File No. E1187001-1	(205) 942-1289 (205) 443-5302	MUELLER PROPERTY HOLDINGS, LLC
Approved By: TWR	Date: MARCH 2018		NORTH BIRMINGHAM PLANT
			BIRMINGHAM, ALABAMA

FIGURE 1

N

0 200

Approximate Scale (Feet)

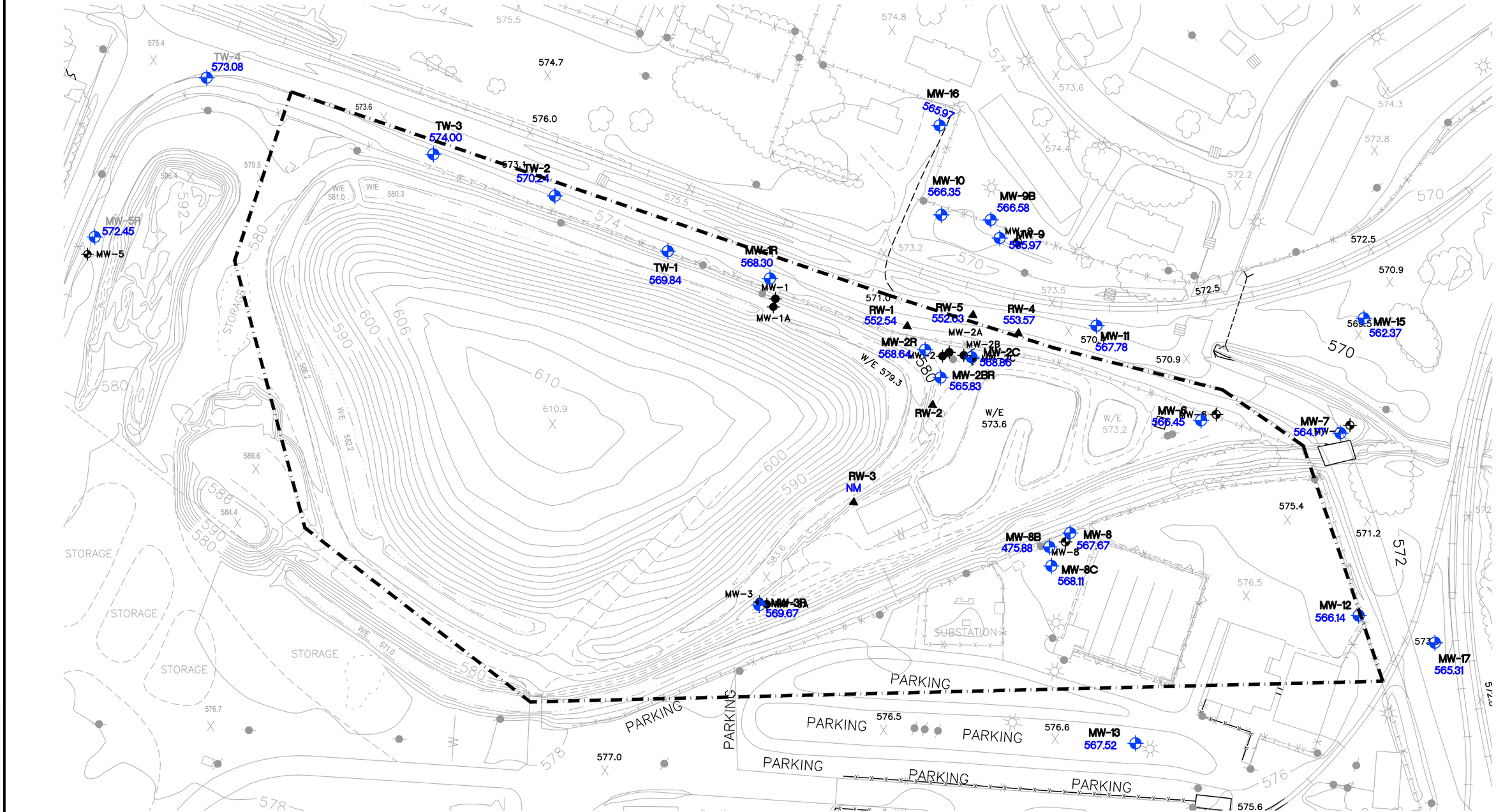
THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

LEGEND

SITE

Project Mngr: TWR	Project No. E1187001	Terracon Consulting Engineers and Scientists	TOPOGRAPHIC MAP
Drawn By: RLW	Scale: AS SHOWN		PART B PERMIT RENEWAL APPLICATION MUELLER PROPERTY HOLDINGS, LLC NORTH BIRMINGHAM PLANT BIRMINGHAM, ALABAMA
Checked By: TWR/MRF	File No. E1187001-2	110 12th Street North (205) 443-5215 Birmingham, Alabama 35203 (205) 443-5302	
Approved By: TWR	Date: MARCH 2018		

FIGURE 2



N

0 100

Approximate Scale (Feet)

LEGEND

SITE

MONITORING WELL LOCATION

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR

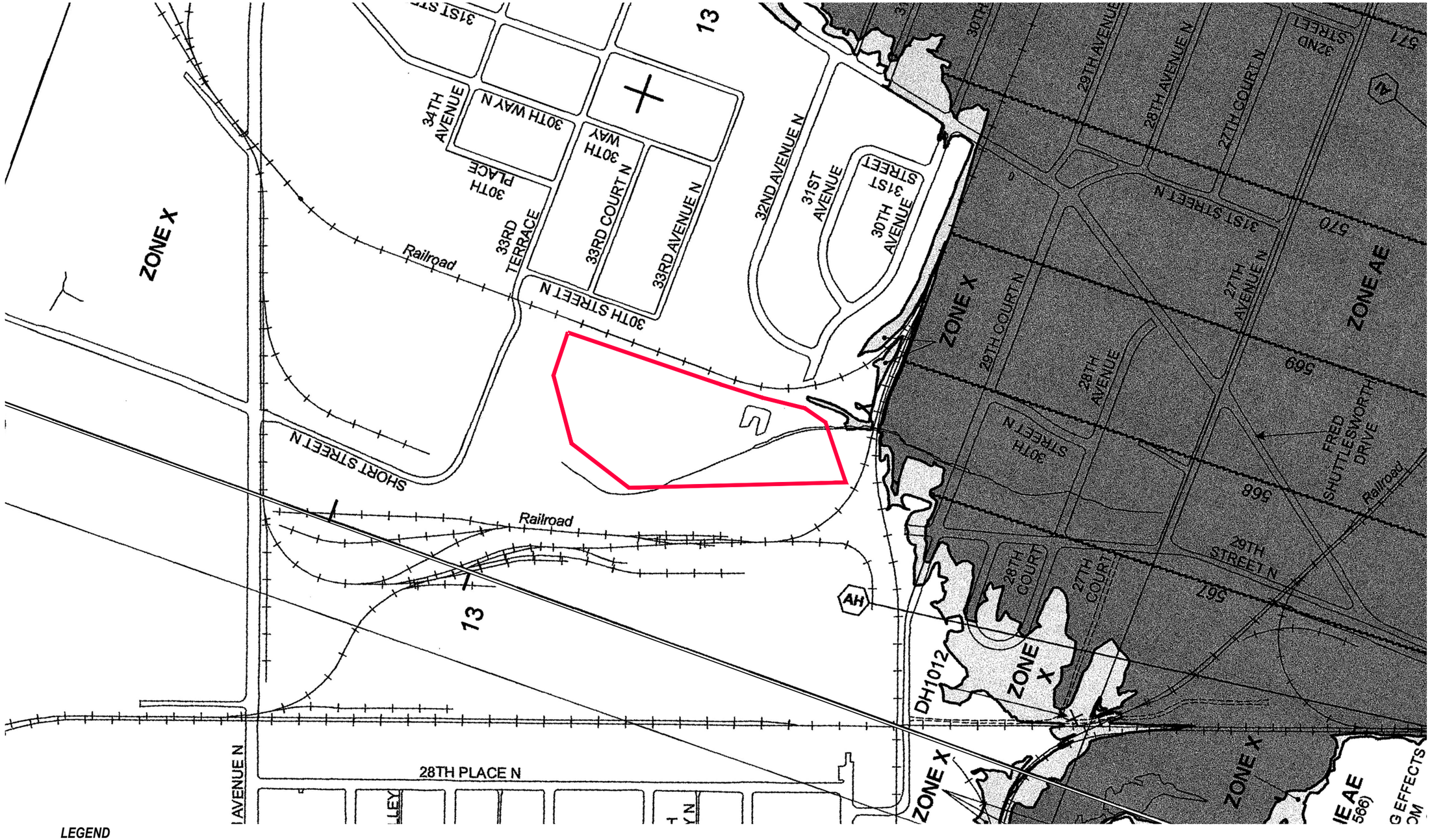
Project No.	E1187001
Scale:	AS SHOWN
File No.	E1187001-3
Date:	MARCH 2018

Terracon
Consulting Engineers and Scientists
110 12th Street North Birmingham, Alabama 35203
(205) 443-5215 (205) 443-5302

MONITORING WELLS, SWMUs AND AOC LOCATION MAP

PART B PERMIT RENEWAL APPLICATION
MUELLER PROPERTY HOLDINGS, LLC
NORTH BIRMINGHAM PLANT
BIRMINGHAM, ALABAMA

FIGURE 3



LEGEND

SITE

SPECIAL FLOOD HAZARD AREA (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD.

ZONE AE BASE FLOOD ELEVATION DETERMINED.

OTHER FLOOD AREA

ZONE X AREA OF 0.2% ANNUAL CHANCE FLOOD; AREA OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 SQUARE MILE;AND AREA PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD.

N

0 400

Approximate Scale (Feet)

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR

Project No.	E1187001
Scale:	AS SHOWN
File No.	E1187001-4
Date:	MARCH 2018

Terracon
Consulting Engineers and Scientists
110 12th Street North Birmingham, Alabama 35203
(205) 443-5215 (205) 443-5302

FLOOD INSURANCE RATE MAP
PART B PERMIT RENEWAL APPLICATION
MUELLER PROPERTY HOLDINGS, LLC
NORTH BIRMINGHAM PLANT
BIRMINGHAM, ALABAMA

FIGURE
4

2018 AERIAL PHOTOGRAPH

N

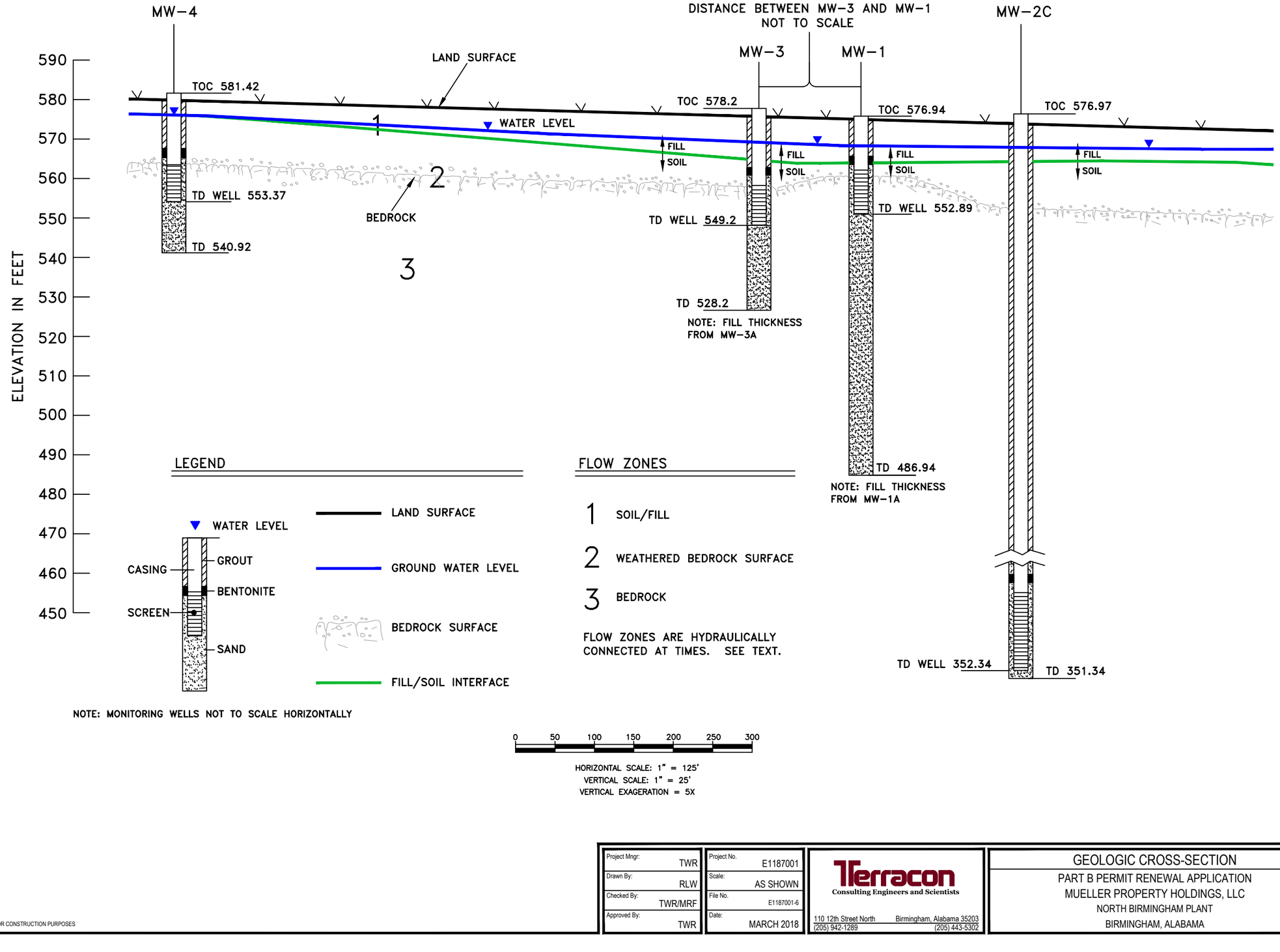
0 700

Approximate Scale (Feet)

* SITE BOUNDARIES ARE APPROXIMATE

Project Mngr: TWR	Project No. E1187001	Terracon Consulting Engineers and Scientists	AERIAL PHOTOGRAPH
Drawn By: RLW	Scale: AS SHOWN		PART B PERMIT RENEWAL APPLICATION
Checked By: TWR/MRF	File No. E1187001-5		MUELLER PROPERTY HOLDINGS, LLC
Approved By: TWR	Date: MARCH 2018	110 12th Street North Birmingham, Alabama 35203 (205) 942-1289 (205) 443-5302	NORTH BIRMINGHAM PLANT BIRMINGHAM, ALABAMA

FIGURE 5



THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

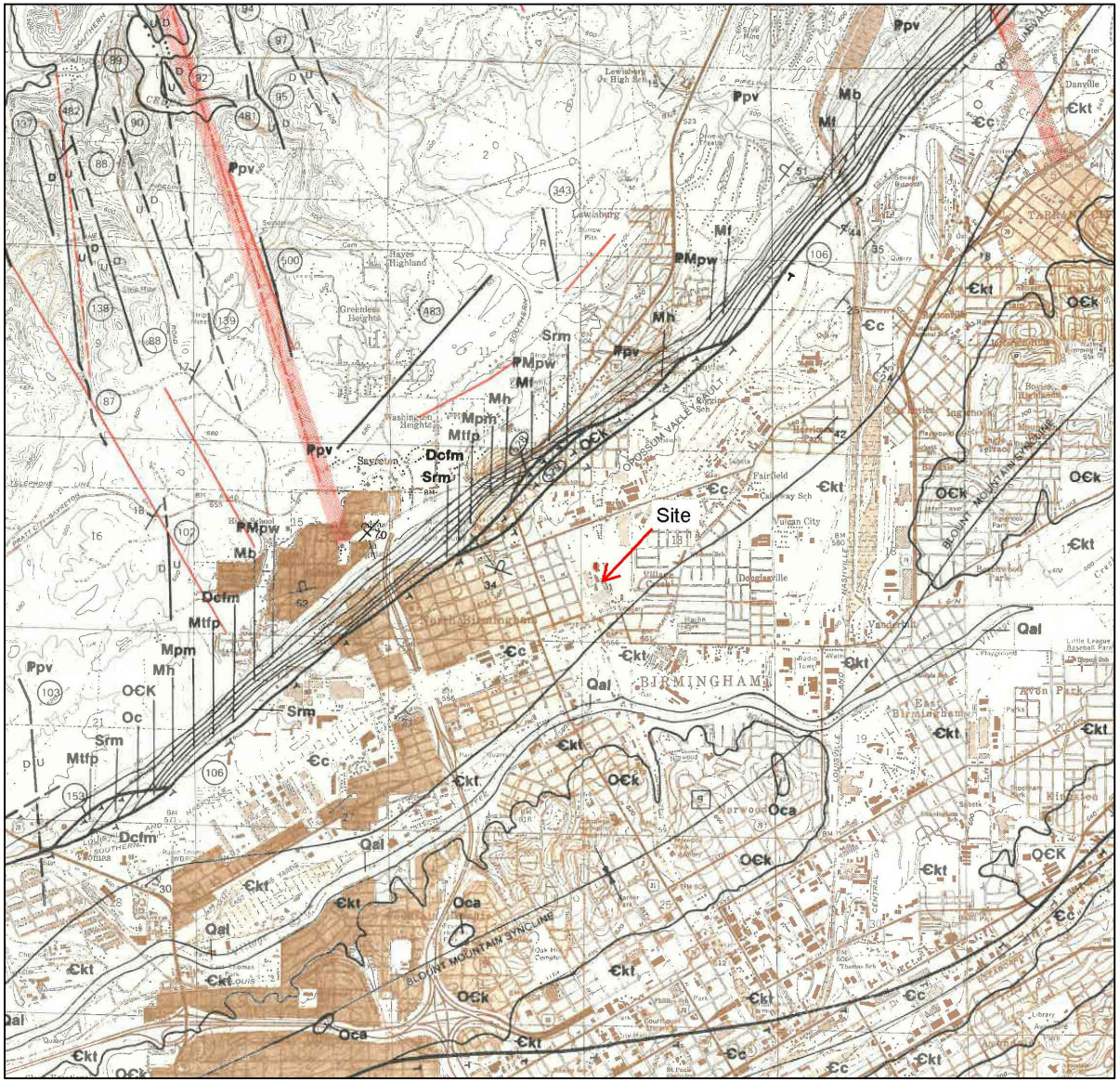
Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR

Project No.	E1187001
Scale:	AS SHOWN
File No.	E1187001-6
Date:	MARCH 2018

Terracon
Consulting Engineers and Scientists
110 12th Street North Birmingham, Alabama 35203
(205) 942-1289 (205) 443-5302

GEOLOGIC CROSS-SECTION
PART B PERMIT RENEWAL APPLICATION
MUELLER PROPERTY HOLDINGS, LLC
NORTH BIRMINGHAM PLANT
BIRMINGHAM, ALABAMA

FIGURE
6



Lineaments from LANDSAT bank-6 print, February 1977

Lineaments from U.S. Geology Survey 7 1/2 - minute orthophotoquads, 1975.

Lineaments from National Aeronautics and Space Administration High-altatude color-infrared photography, February 22, 1973

Anticline, axial trace

Syncline, axial trace

Syncline, axial trace showing direction of plunge

Fault, relative movement not known

Normal fault, T on upper plate

U / D — Fault, showing relative horizontal side

Strike and dip of beds

Strike and dip of overturned beds

R R — Strike of vertical beds

Horizontal beds

Contact of geologic units, dotted where concealed

Fault reference number

Fold reference number

98 5 / 4 — Faults, synclines and anticlines are dashed where inferred; dotted where concealed.

N

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

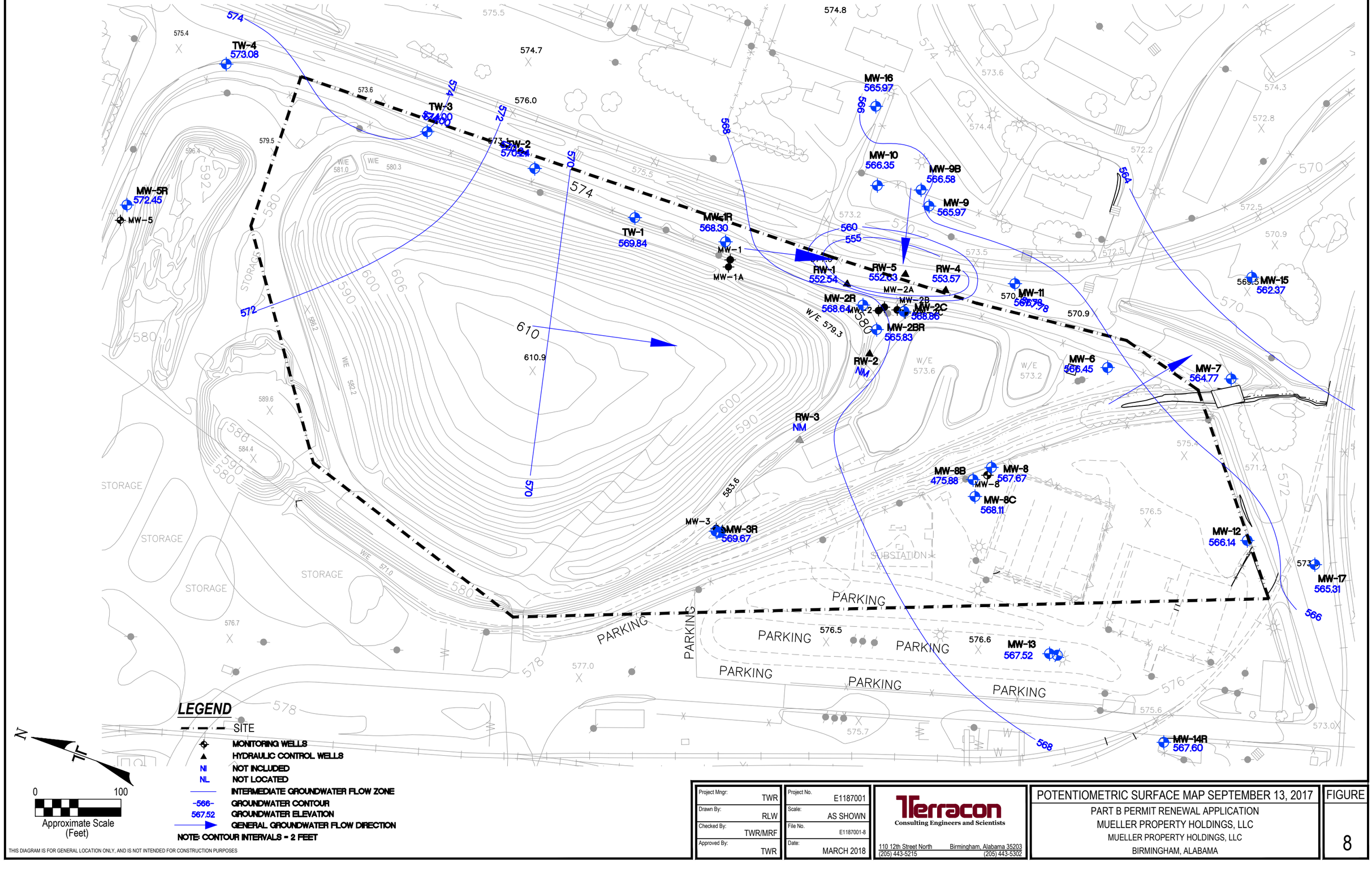
Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR
Project No.	E1187001
Scale:	AS SHOWN
File No.	E1187001-7
Date:	MARCH 2018

Terracon
Consulting Engineers and Scientists
110 12th Street North Birmingham, Alabama 35203
(205) 443-5215 (205) 443-5302

GEOLOGIC MAP

PART B PERMIT RENEWAL APPLICATION
MUELLER PROPERTY HOLDINGS, LLC
NORTH BIRMINGHAM PLANT
BIRMINGHAM, ALABAMA

FIGURE 7



LEGEND

- SITE
- MONITORING WELLS
- HYDRAULIC CONTROL WELLS
- NI — NOT INCLUDED
- NL — NOT LOCATED
- INTERMEDIATE GROUNDWATER FLOW ZONE
- -566- — GROUNDWATER CONTOUR
- 567.52 — GROUNDWATER ELEVATION
- GENERAL GROUNDWATER FLOW DIRECTION

NOTE: CONTOUR INTERVALS = 2 FEET

N

0 100

Approximate Scale (Feet)

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR

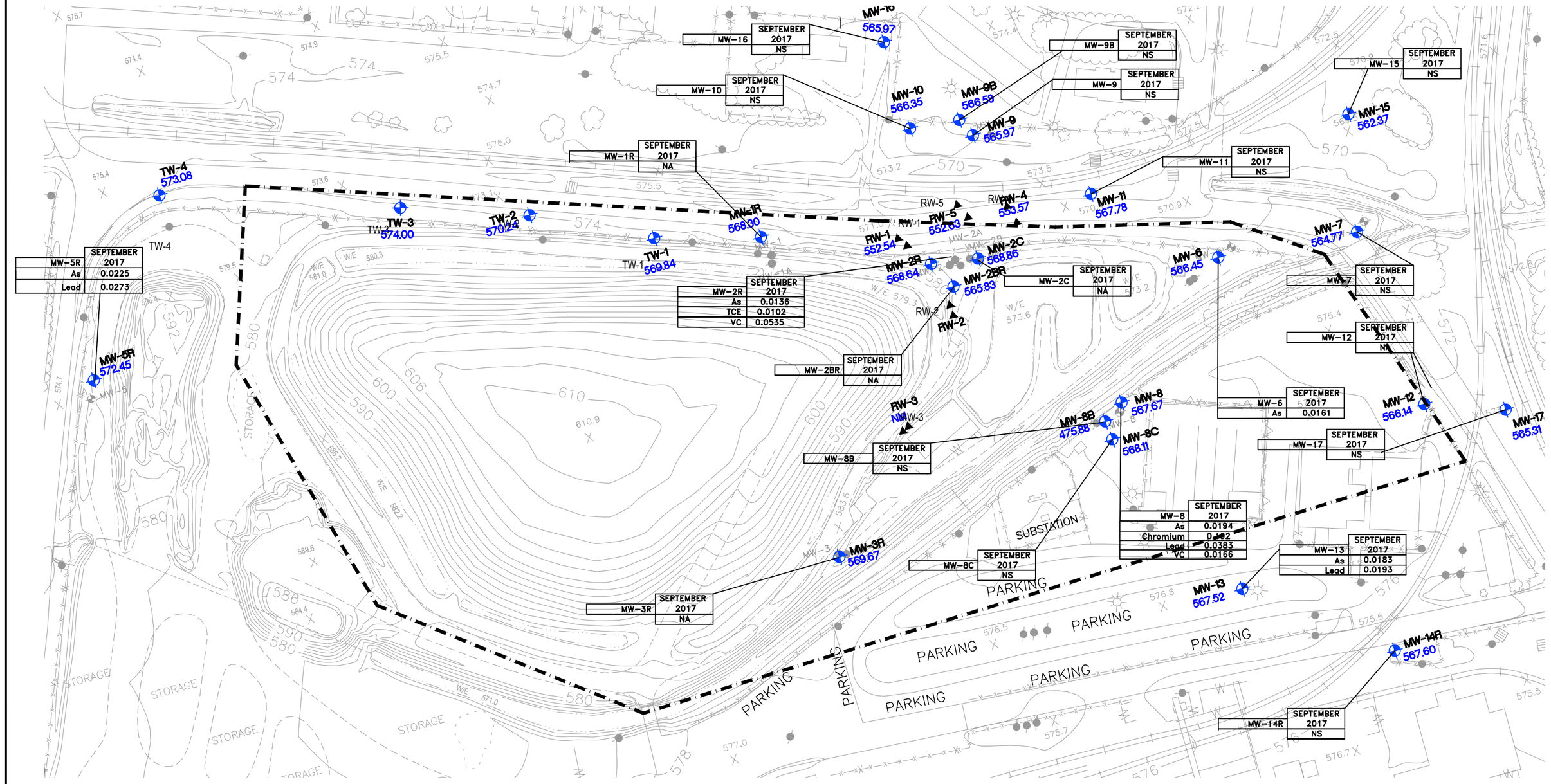
Project No.	E1187001
Scale:	AS SHOWN
File No.	E1187001-8
Date:	MARCH 2018

Terracon
Consulting Engineers and Scientists
110 12th Street North Birmingham, Alabama 35203
(205) 443-5215 (205) 443-5302

POTENTIOMETRIC SURFACE MAP SEPTEMBER 13, 2017

PART B PERMIT RENEWAL APPLICATION
MUELLER PROPERTY HOLDINGS, LLC
MUELLER PROPERTY HOLDINGS, LLC
BIRMINGHAM, ALABAMA

FIGURE 8



LEGEND

- SITE
- MONITORING WELL LOCATION
- HYDRAULIC CONTROL WELL

cis-1,2-DCE	cis-1,2-DICHLOROETHENE
1,1-DCE	1,1-DICHLOROETHENE
TCE	TRICHLOROETHENE
VC	VINYL CHLORIDE
As	ARSENIC
Bis(1-e)P	BIS(2-ETHYLHEXYL)PHTHALATE

GWPS GROUNDWATER PROTECTION STANDARDS
COPCs CHEMICALS OF POTENTIAL CONCERN
NS NOT SAMPLED
NA NO COPCs ABOVE GWPS
RESULTS ARE IN MILLIGRAMS/LITER (mg/L)
* – VALUE IS ESTIMATED BY THE LABORATORY

N

0 200
Approximate Scale (Feet)

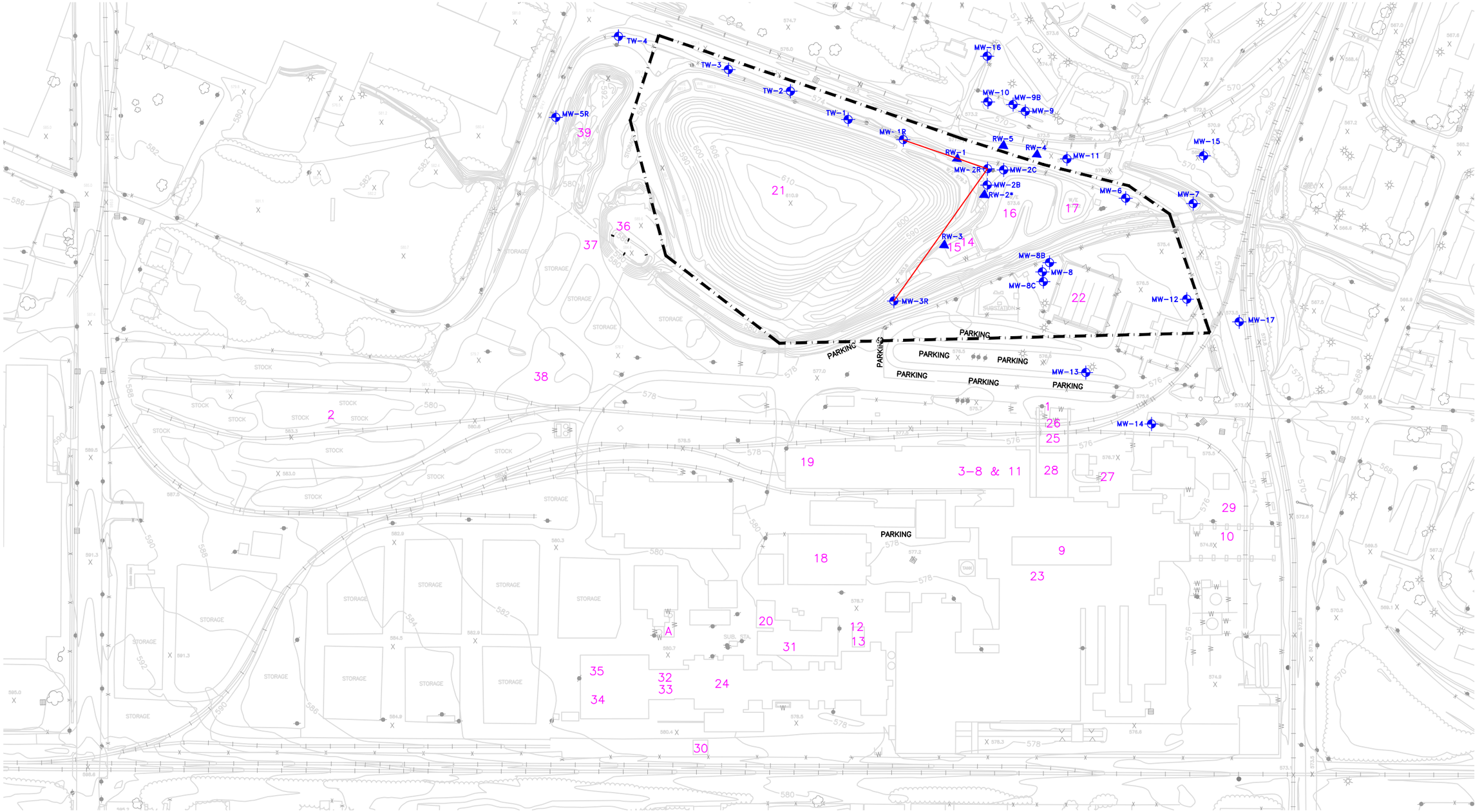
THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR
Project No.	E1187001
Scale:	AS SHOWN
File No.	E1187001-9
Date:	MARCH 2018

Terracon
Consulting Engineers and Scientists
110 12th Street North Birmingham, Alabama 35203
(205) 443-5215 (205) 443-5302

COPCs IN GROUNDWATER THAT EXCEED THE GWPS SEPTEMBER 13. 2017
PART B PERMIT RENEWAL APPLICATION
MUELLER PROPERTY HOLDINGS, LLC
NORTH BIRMINGHAM PLANT
BIRMINGHAM, ALABAMA

FIGURE 9



N

0 200

Approximate Scale (Feet)

LEGEND

- SITE
- MONITORING WELLS
- HYDRAULIC CONTROL WELL
- POINT OF COMPLIANCE
- 1–24 & A PREVIOUSLY IDENTIFIED SWMUs & AOC

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR
Project No.	E1187001
Scale:	AS SHOWN
File No.	E1187001-10
Date:	MARCH 2018

Terracon
Consulting Engineers and Scientists
110 12th Street North Birmingham, Alabama 35203
(205) 443-5215 (205) 443-5302

MONITORING WELLS, SWMUs, AND AOC
PART B PERMIT RENEWAL APPLICATION
MUELLER PROPERTY HOLDINGS, LLC
NORTH BIRMINGHAM PLANT
BIRMINGHAM, ALABAMA

FIGURE 10

APPENDIX A
PART A

OMB# 2050-0024; Expires 01/31/2017

SEND COMPLETED FORM TO: The Appropriate State or Regional Office.

United States Environmental Protection Agency
RCRA SUBTITLE C SITE IDENTIFICATION FORM

1. Reason for Submittal

MARK ALL BOX(ES) THAT APPLY

Reason for Submittal:

- ☐ To provide an Initial Notification (first time submitting site identification information / to obtain an EPA ID number for this location)
- ☐ To provide a Subsequent Notification (to update site identification information for this location)
- ☐ As a component of a First RCRA Hazardous Waste Part A Permit Application
- ☒ As a component of a Revised RCRA Hazardous Waste Part A Permit Application (Amendment #_____)
- ☐ As a component of the Hazardous Waste Report (If marked, see sub-bullet below)
  - ☐ Site was a TSD facility and/or generator of >1,000 kg of hazardous waste, >1 kg of acute hazardous waste, or >100 kg of acute hazardous waste spill cleanup in one or more months of the report year (or State equivalent LQG regulations)

2. Site EPA ID Number

EPA ID Number A L D 0 0 4 0 1 7 9 0 1

3. Site Name

Name: Mueller Property Holdings, LLC

4. Site Location Information

Street Address: 3000 30TH AVENUE NORTH

City, Town, or Village: BIRMINGHAM | **County:** JEFFERSON

State: ALABAMA | **Country:** USA | **Zip Code:** 35207

5. Site Land Type

☑ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

6. NAICS Code(s) for the Site (at least 5-digit codes)

A. 3 3 1 5 1 1 | **C.**

B. | **D.**

7. Site Mailing Address

Street or P.O. Box: 1200 ABERNATHY ROAD NE

City, Town, or Village: ATLANTA

State: GEORGIA | **Country:** USA | **Zip Code:** 30328

8. Site Contact Person

First Name: GREG | **MI:** | **Last:** HOLLOD

Title: VP EHS

Street or P.O. Box: 1200 ABERNATHY ROAD NE

City, Town or Village: ATLANTA

State: GEORGIA | **Country:** USA | **Zip Code:** 30328

Email: ghollod@muellerwp.com

Phone: 770-206-4209 | **Ext.:** | **Fax:**

9. Legal Owner and Operator of the Site

A. Name of Site's Legal Owner: Mueller Property Holdings, LLC | **Date Became Owner:**

Owner Type: ☑ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

Street or P.O. Box: 1200 ABERNATHY ROAD NE

City, Town, or Village: ATLANTA | **Phone:** 770-206-4209

State: GEORGIA | **Country:** USA | **Zip Code:** 30328

B. Name of Site's Operator: SAME | **Date Became Operator:** 9/23/2005

Operator Type: ☐ Private ☐ County ☐ District ☐ Federal ☐ Tribal ☐ Municipal ☐ State ☐ Other

10. Type of Regulated Waste Activity (at your site)
Mark "Yes" or "No" for all current activities (as of the date submitting the form); complete any additional boxes as instructed.

A. Hazardous Waste Activities; Complete all parts 1-10.

Y ☐ N ☑ **1. Generator of Hazardous Waste**
If "Yes," mark only one of the following – a, b, or c.

- ☐ a. LQG: Generates, in any calendar month, 1,000 kg/mo (2,200 lbs/mo.) or more of hazardous waste; **or** Generates, in any calendar month, or accumulates at any time, more than 1 kg/mo (2.2 lbs/mo) of acute hazardous waste; **or** Generates, in any calendar month, **or** accumulates at any time, more than 100 kg/mo (220 lbs/mo) of acute hazardous spill cleanup material.
- ☐ b. SQG: 100 to 1,000 kg/mo (220 – 2,200 lbs/mo) of non-acute hazardous waste.
- ☐ c. CESQG: Less than 100 kg/mo (220 lbs/mo) of non-acute hazardous waste.

If "Yes" above, indicate other generator activities in 2-10.

Y ☐ N ☑ **2. Short-Term Generator** (generate from a short-term or one-time event and not from on-going processes). If "Yes," provide an explanation in the Comments section.

Y ☐ N ☑ **3. United States Importer of Hazardous Waste**

Y ☐ N ☑ **4. Mixed Waste (hazardous and radioactive) Generator**

Y ☐ N ☐ **5. Transporter of Hazardous Waste**
If "Yes," mark all that apply.

- ☐ a. Transporter
- ☐ b. Transfer Facility (at your site)

Y ☐ N ☐ **6. Treater, Storer, or Disposer of Hazardous Waste** Note: A hazardous waste Part B permit is required for these activities.

Y ☐ N ☐ **7. Recycler of Hazardous Waste**

Y ☐ N ☐ **8. Exempt Boiler and/or Industrial Furnace**
If "Yes," mark all that apply.

- ☐ a. Small Quantity On-site Burner Exemption
- ☐ b. Smelting, Melting, and Refining Furnace Exemption

Y ☐ N ☐ **9. Underground Injection Control**

Y ☐ N ☐ **10. Receives Hazardous Waste from Off-site**

B. Universal Waste Activities; Complete all parts 1-2.

Y ☐ N ☑ **1. Large Quantity Handler of Universal Waste (you accumulate 5,000 kg or more) [refer to your State regulations to determine what is regulated]. Indicate types of universal waste managed at your site. If "Yes," mark all that apply.**

- a. Batteries ☐
- b. Pesticides ☐
- c. Mercury containing equipment ☐
- d. Lamps ☐
- e. Other (specify) _____ ☐
- f. Other (specify) _____ ☐
- g. Other (specify) _____ ☐

Y ☐ N ☑ **2. Destination Facility for Universal Waste**
Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities; Complete all parts 1-4.

Y ☐ N ☑ **1. Used Oil Transporter**
If "Yes," mark all that apply.

- ☐ a. Transporter
- ☐ b. Transfer Facility (at your site)

Y ☐ N ☑ **2. Used Oil Processor and/or Re-refiner**
If "Yes," mark all that apply.

- ☐ a. Processor
- ☐ b. Re-refiner

Y ☐ N ☑ **3. Off-Specification Used Oil Burner**

Y ☐ N ☑ **4. Used Oil Fuel Marketer**
If "Yes," mark all that apply.

- ☐ a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner
- ☐ b. Marketer Who First Claims the Used Oil Meets the Specifications

D. Eligible Academic Entities with Laboratories—Notification for opting into or withdrawing from managing laboratory hazardous wastes pursuant to 40 CFR Part 262 Subpart K

❖ You can ONLY Opt into Subpart K if:

- you are at least one of the following: a college or university; a teaching hospital that is owned by or has a formal affiliation agreement with a college or university; or a non-profit research institute that is owned by or has a formal affiliation agreement with a college or university; AND
- you have checked with your State to determine if 40 CFR Part 262 Subpart K is effective in your state

Y☐ N☐ 1. Opting into or currently operating under 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories **See the item-by-item instructions for definitions of types of eligible academic entities. Mark all that apply:**

☐ **a. College or University**

☐ **b. Teaching Hospital that is owned by or has a formal written affiliation agreement with a college or university**

☐ **c. Non-profit Institute that is owned by or has a formal written affiliation agreement with a college or university**

Y☐ N☐ 2. Withdrawing from 40 CFR Part 262 Subpart K for the management of hazardous wastes in laboratories

11. Description of Hazardous Waste

A. Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g., D001, D003, F007, U112). Use an additional page if more spaces are needed.

D80						

B. Waste Codes for State-Regulated (i.e., non-Federal) Hazardous Wastes. Please list the waste codes of the State-Regulated hazardous wastes handled at your site. List them in the order they are presented in the regulations. Use an additional page if more spaces are needed.

D80						

12. Notification of Hazardous Secondary Material (HSM) Activity

Y ☐ N ☑ Are you notifying under 40 CFR 260.42 that you will begin managing, are managing, or will stop managing hazardous secondary material under 40 CFR 261.2(a)(2)(ii), 40 CFR 261.4(a)(23), (24), or (25)?

If "Yes," you must fill out the Addendum to the Site Identification Form: Notification for Managing Hazardous Secondary Material.

13. Comments

The D80 landfill is closed and is being managed under a Part B Permit.

14. Certification. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations. For the RCRA Hazardous Waste Part A Permit Application, all owner(s) and operator(s) must sign (see 40 CFR 270.10(b) and 270.11).

Signature of legal owner, operator, or an authorized representative	Name and Official Title (type or print)	Date Signed (mm/dd/yyyy)
Gregory J Hollert	VP EHS	3/20/15

EPA ID Number | A | L | D | 0 | 0 | 4 | 0 | 1 | 7 | 9 | 0 | 1 | OMB#: 2050-0024; Expires 01/31/2017

United States Environmental Protection Agency

HAZARDOUS WASTE PERMIT INFORMATION FORM

1. Facility Permit Contact	**First Name:** GREG	**MI:**	**Last Name:** HOLLOD	
	Contact Title: VP EHS			
	Phone: 770-206-4209	**Ext.:**	**Email:** ghollod@muellerwp.com	
2. Facility Permit Contact Mailing Address	**Street or P.O. Box:** 1200 ABERNATHY ROAD NE			
	City, Town, or Village: ATLANTA			
	State: GEORGIA			
	Country: USA	**Zip Code:** 30328		
3. Operator Mailing Address and Telephone Number	**Street or P.O. Box:** SAME			
	City, Town, or Village:			
	State:	**Phone:**		
	Country:	**Zip Code:**		
4. Facility Existence Date	**Facility Existence Date (mm/dd/yyyy):** 12/1973			

5. Other Environmental Permits

A. Facility Type *(Enter code)*	B. Permit Number	C. Description

6. Nature of Business: Post-Closure Part B Landfill

7. Process Codes and Design Capacities – Enter information in the Section on Form Page 3

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. If more lines are needed, attach a separate sheet of paper with the additional information. For "other" processes (i.e., D99, S99, T04 and X99), describe the process (including its design capacity) in the space provided in Item 8.

B. PROCESS DESIGN CAPACITY – For each code entered in Item 7.A; enter the capacity of the process.

1. **AMOUNT – Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process.**
2. **UNIT OF MEASURE – For each amount entered in Item 7.B(1), enter the code in Item 7.B(2) from the list of unit of measure codes below that describes the unit of measure used. Select only from the units of measure in this list.**

C. PROCESS TOTAL NUMBER OF UNITS – Enter the total number of units for each corresponding process code.

Process Code	Process	Appropriate Unit of Measure for Process Design Capacity
Disposal		
D79	Underground Injection Well Disposal	Gallons; Liters; Gallons Per Day; or Liters Per Day
D80	Landfill	Acre-feet; Hectares-meter; Acres; Cubic Meters; Hectares; Cubic Yards
D81	Land Treatment	Acres or Hectares
D82	Ocean Disposal	Gallons Per Day or Liters Per Day
D83	Surface Impoundment Disposal	Gallons; Liters; Cubic Meters; or Cubic Yards
D99	Other Disposal	Any Unit of Measure Listed Below
Storage		
S01	Container	Gallons; Liters; Cubic Meters; or Cubic Yards
S02	Tank Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S03	Waste Pile	Cubic Yards or Cubic Meters
S04	Surface Impoundment	Gallons; Liters; Cubic Meters; or Cubic Yards
S05	Drip Pad	Gallons; Liters; Cubic Meters; Hectares; or Cubic Yards
S06	Containment Building Storage	Cubic Yards or Cubic Meters
S99	Other Storage	Any Unit of Measure Listed Below
Treatment		
T01	Tank Treatment	Gallons Per Day; Liters Per Day
T02	Surface Impoundment	Gallons Per Day; Liters Per Day
T03	Incinerator	Short Tons Per Hour; Metric Tons Per Hour; Gallons Per Hour; Liters Per Hour; BTUs Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Gallons Per Day; Metric Tons Per Hour; or Million BTU Per Hour
T04	Other Treatment	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Short Tons Per Day; BTUs Per Hour; Gallons Per Day; Liters Per Hour; or Million BTU Per Hour
T80	Boiler	Gallons; Liters; Gallons Per Hour; Liters Per Hour; BTUs Per Hour; or Million BTU Per Hour
T81	Cement Kiln	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; Liters Per Hour; Kilograms Per Hour; or Million BTU Per Hour
T82	Lime Kiln	
T83	Aggregate Kiln	
T84	Phosphate Kiln	
T85	Coke Oven	
T86	Blast Furnace	
T87	Smelting, Melting, or Refining Furnace	
T88	Titanium Dioxide Chloride Oxidation Reactor	
T89	Methane Reforming Furnace	
T90	Pulping Liquor Recovery Furnace	
T91	Combustion Device Used in the Recovery of Sulfur Values from Spent Sulfuric Acid	
T92	Halogen Acid Furnaces	
T93	Other Industrial Furnaces Listed in 40 CFR 260.10	
T94	Containment Building Treatment	Cubic Yards; Cubic Meters; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; BTU Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million BTU Per Hour
Miscellaneous (Subpart X)		
X01	Open Burning/Open Detonation	Any Unit of Measure Listed Below
X02	Mechanical Processing	Short Tons Per Hour; Metric Tons Per Hour; Short Tons Per Day; Metric Tons Per Day; Pounds Per Hour; Kilograms Per Hour; Gallons Per Hour; Liters Per Hour; or Gallons Per Day
X03	Thermal Unit	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; BTU Per Hour; or Million BTU Per Hour
X04	Geologic Repository	Cubic Yards; Cubic Meters; Acre-feet; Hectare-meter; Gallons; or Liters
X99	Other Subpart X	Any Unit of Measure Listed Below

Unit of Measure	Unit of Measure Code
Gallons	G
Gallons Per Hour	E
Gallons Per Day	U
Liters	L
Liters Per Hour	H
Liters Per Day	V
Short Tons Per Hour	D
Short Tons Per Day	N
Metric Tons Per Hour	W
Metric Tons Per Day	S
Pounds Per Hour	J
Kilograms Per Hour	X
Million BTU Per Hour	X
Cubic Yards	Y
Cubic Meters	C
Acres	B
Acre-feet	A
Hectares	Q
Hectare-meter	F
BTU Per Hour	I

7. Process Codes and Design Capacities (Continued)

EXAMPLE FOR COMPLETING Item 7 (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons.

Line Number		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY		C. Process Total Number of Units	For Official Use Only					
					(1) Amount (Specify)	(2) Unit of Measure							
X	1	S	0	2	533.788	G	001						
	1	D	8	0	(closed) 0.0	A	001						
	2												
	3												
	4												
	5												
	6												
	7												
	8												
	9												
1	0												
1	1												
1	2												
1	3												

Note: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the line sequentially, taking into account any lines that will be used for "other" process (i.e., D99, S99, T04, and X99) in Item 8.

8. Other Processes (Follow instructions from Item 7 for D99, S99, T04, and X99 process codes)

Line Number (Enter #s in sequence with Item 7)		A. Process Code (From list above)			B. PROCESS DESIGN CAPACITY		C. Process Total Number of Units	For Official Use Only					
					(1) Amount (Specify)	(2) Unit of Measure							
X	2	T	0	4	100.00	U	001						

9. Description of Hazardous Wastes - Enter Information in the Sections on Form Page 5

A. EPA HAZARDOUS WASTE NUMBER – Enter the four-digit number from 40 CFR, Part 261 Subpart D of each listed hazardous waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-digit number(s) from 40 CFR Part 261, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY – For each listed waste entered in Item 9.A, estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in Item 9.A, estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE – For each quantity entered in Item 9.B, enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure, taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in Item 9.A, select the code(s) from the list of process codes contained in Items 7.A and 8.A on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all listed hazardous wastes.

For non-listed waste: For each characteristic or toxic contaminant entered in Item 9.A, select the code(s) from the list of process codes contained in Items 7.A and 8.A on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:

1. **Enter the first two as described above.**
2. **Enter "000" in the extreme right box of Item 9.D(1).**
3. **Use additional sheet, enter line number from previous sheet, and enter additional code(s) in Item 9.E.**

2. PROCESS DESCRIPTION: If code is not listed for a process that will be used, describe the process in Item 9.D(2) or in Item 9.E(2).

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER – Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. **Select one of the EPA Hazardous Waste Numbers and enter it in Item 9.A. On the same line complete Items 9.B, 9.C, and 9.D by estimating the total annual quantity of the waste and describing all the processes to be used to store, treat, and/or dispose of the waste.**
2. **In Item 9.A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In Item 9.D.2 on that line enter "included with above" and make no other entries on that line.**
3. **Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.**

EXAMPLE FOR COMPLETING Item 9 (shown in line numbers X-1, X-2, X-3, and X-4 below) – A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operations. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

Line Number		A. EPA Hazardous Waste No. (Enter code)				B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES									
								(1) PROCESS CODES (Enter Code)									(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))
X	1	K	0	5	4	900	P	T	0	3	D	8	0				
X	2	D	0	0	2	400	P	T	0	3	D	8	0				
X	3	D	0	0	1	100	P	T	0	3	D	8	0				
X	4	D	0	0	2												Included With Above

9. Description of Hazardous Wastes *(Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)*

Line Number		A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES	
					(1) PROCESS CODES (Enter Code)	(2) PROCESS DESCRIPTION (If code is not entered in 9.D(1))
	1	D 0 0 8				included with above
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
1	0					
1	1					
1	2					
1	3					
1	4					
1	5					
1	6					
1	7					
1	8					
1	9					
2	0					
2	1					
2	2					
2	3					
2	4					
2	5					
2	6					
2	7					
2	8					
2	9					
3	0					
3	1					
3	2					
3	3					
3	4					
3	5					
3	6					

9. Description of Hazardous Wastes ***(Continued. Use additional sheet(s) as necessary; number pages as 5a, etc.)***

Line Number		A. EPA Hazardous Waste No. (Enter code)				B. Estimated Annual Qty of Waste	C. Unit of Measure (Enter code)	D. PROCESSES									
								(1) PROCESS CODES (Enter Code)									(2) PROCESS DESCRIPTION (If code is not entered in 9.D.1)

10. Map

Attach to this application a topographical map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all spring, rivers, and other surface water bodies in this map area. See instructions for precise requirements.

11. Facility Drawing

All existing facilities must include a scale drawing of the facility (see instructions for more detail).

12. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment, or disposal areas (see instructions for more detail).

13. Comments

APPENDIX B
INSPECTION SCHEDULE

APPENDIX B - INSPECTION SCHEDULE

Mueller Property Holdings, LLC will conduct regular inspections of the landfill for structural deterioration, equipment failure, operator errors, and discharges that could cause or lead to the release of hazardous waste constituents and adversely affect the environment or threaten human health. Table 1 presents the schedule for inspecting monitoring equipment, safety and emergency equipment, security devices, decontamination equipment, and the landfill area. Since the facility is closed, a copy of the inspection schedule will be kept at the Mueller Property Holdings, LLC headquarters in Atlanta, Georgia.

In compliance with Rule 335-14-5-.14(11)(b) which is applicable to landfills, the most important requirement of this inspection process will be the inspection of the landfill slopes for signs of instability. To accomplish this, the inspector will be familiar with the important indicators of slope movement and surface erosion. Results of each inspection will be recorded on inspection log sheets entitled, “Periodic Inspection Forms" (Figure 1).

Upon completion of the inspection log sheets, they will be scanned and filed electronically at the Mueller Property Holdings, LLC headquarters. The Mueller Property Holdings, LLC or their consultant will also insert the inspections in a three-ring binder and maintain them. The inspector should note the presence of any cracks, bulges or surface movement of material on the inspection form. He should also:

- describe the approximate width and length of each crack found on the slope or crest;
- record the size of any bulging;
- record the overall size of any surface displacement; and
- record the location of each sign of instability on a sketch of the landfill.

Another condition that will be observed and noted by the inspector while inspecting the landfill is surface erosion. To ensure the integrity of the landfill cover, it will be necessary to catch the formation of erosion gullies at their earliest stage of development to prevent deep cutting into the landfill.

In addition to inspecting the landfill to ensure its integrity, it will also be necessary to inspect the monitoring wells located around the landfill, and the security barriers and signs. The inspector will report any evidence of tampering or damage that is observed during his routine inspections.

TABLE 1
POST-CLOSURE INSPECTION SCHEDULE

Area/Equipment	Specific Item	Potential Problems	Inspection Frequency
Monitoring Equipment	Groundwater Monitoring Wells	Damage to inner casing, functioning locks Absent or damaged protective housing Missing well cap Vandalized equipment	Semi-Annually
Security Devices	Facility fence Entrance Gates Warning signs	Corrosion, collision damage, holes Corrosion, collision damage, holes Vandalism, damage	Quarterly
Landfill Area	Crest slopes, and berms Cap Sprinkler system	Cracks, erosion gullies Cracks in the cap, erosion gullies, bulging or other signs of movement Leaks, and functioning properly	Monthly
Hydraulic Control	Groundwater Pumps	Functioning properly, pipelines damaged	Twice a month

PERIODIC INSPECTION FORM

Mueller Property Holdings, LLC North Birmingham Pipe Plant Landfill

Inspector's Name: _____

Date: _____ Time: _____

Date of Last Inspection: _____

Circle or write in Appropriate Response

Cracks or scarps in crest	Yes	No
Sloughing or bulging	Yes	No
Major slope erosion problems	Yes	No
Cracks or scarps in slope	Yes	No
Surface movements	Yes	No
Erosion of toe	Yes	No
Damage or vandalism to monitoring wells	Yes	No
Damage or vandalism to security fence	Yes	No
Damage or vandalism to security signs	Yes	No
Are there any existing environmental or human health hazards	Yes	No

Any major adverse changes in these items could result in a potential hazard to human health or the environment and should be reported to the Corporate Manager, Environmental Health and Safety or the Vice President Environmental Health and Saftey for further evaluation. Adverse conditions noted in these items should be described (extent, location, volume, observations, and the nature of remedial actions) in the space below or on attached additional sheets. A sketch showing locations of any adverse conditions should also be attached.

Inspection Category	Comments

APPENDIX C
RUN-OFF CALCULATIONS

CALCULATION SHEET

Sheet 1 of 6

By

Date

RE:

Runoff Volume Calculation
North Birmingham

Unified Soil Class = SM

SCS Soil Hydrologic Group = C

24 hr 25 yr storm in Jeff. Co = 7.0 inches

Closure Conditions:

Area = 6.7 ac

Land condition = bare ground

SCS Method:

CN for bare ground = 91

$$S = \frac{1000}{CN} - 10 = \frac{1000}{91} - 10 = .99$$

$$\text{Run-off volume} = \frac{(P - 0.2S)^2}{(P + 0.8S)} = \frac{(7.0 - (.2)(.99))^2}{(7.0 + (.8)(.99))}$$

$$= 6.09 \text{ inches}$$

watershed = 6.7 acres

$$\text{Total Run-off Volume} = 6.7 \text{ ac} \times 6.09 \text{ in} \times \frac{1 \text{ ft}}{12 \text{ in}}$$

$$= 3.4 \text{ ac. ft}$$

$$= 148,115 \text{ cu. ft}$$

CALCULATION SHEET

Sheet 2 of —

By

Date

RE:

Height of Berm (ft)	Retention Area Behind Berm (ft^2)	Cumulative Storage Volume (ft^3)
0	51940	—
.1	60930	56,460
2	70020	121,960
3	79,060	196,500

Design volume = 148,115 cu. ft

Depth behind berm = $\frac{1}{196,500 - 121,960} = \frac{x}{148,115 - }$

= 2.35 ft.

for design add 1.5 ft for freeboard

Minimum height of berm = 3.9 ft

CALCULATION SHEET

Sheet 6 of —

By

Date

RE:

Height of Berm (ft)	Retention Area (ft²)	Cumulated Storage Volume (ft³)
0	75,616	—
1	84,656	80,136
2	93,696	169312
3	102,736	267,528

Design Volume = 106,040

Depth behind berm = $\frac{1}{169,312 - 80,136} = \frac{x}{169312 - 106,040}$

= 1.71

this depth is less than the worse case design for Closure therefore berms are adequate.

CALCULATION SHEET

Sheet 3 of 4

By

Date

RE:

Post-Closure Conditions:

Area = 6.7 acres

Land Condition = grass

SCS Method:

CN for grass = 74

$$S = \frac{1000}{CN} - 10 = \frac{1000}{74} - 10 = 3.51$$

$$\text{Run-off Volume} = \frac{(P - 0.2S)^2}{(P + 0.8S)} = \frac{(7.0 - (.2)(3.51))^2}{(7 + (0.8)(3.51))}$$

$$= 4.36 \text{ inches}$$

Watershed = 6.7 acres

$$\text{Total Runoff Volume} = 6.7 \text{ ac} \times 4.36 \text{ inches} \times \frac{\text{ft}}{12 \text{ in}}$$

$$= 2.4 \text{ ac ft}$$

$$= 106,000 \text{ cu. ft}$$

APPENDIX D.
CORRECTIVE ACTION PROGRAM
SWMU 21 – CLOSED LANDFILL

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

Appendix D – Corrective Action Program – SWMU 21 – Landfill

Mueller Property Holdings, LLC
Birmingham, Alabama
Facility ID No. ALD004017901
Terracon Project No.: E1187001

1.0 BACKGROUND AND GENERAL OVERVIEW

The *Corrective Action Program*, described herein, consists of:

- Institutional Controls; and
- Hydraulic Control.

Implementation of the Institutional Controls was described in the previously-submitted *Landfill Closure Certification*. Hydraulic Control was initiated under the proposed *Interim Measures (IM) Workplan*, *IM Workplan (Revision 1.0)* and *IM Workplan (Revision 2.0)* previously submitted to the Department.

Corrective Action Monitoring is part of this *Corrective Action Program*. The Corrective Action Monitoring includes the collection and analysis of groundwater samples, as well as reporting requirements. In addition, the Corrective Action Monitoring includes:

- Collection of several monitored natural attenuation parameters and groundwater elevation data;
- Comparison of groundwater concentrations for constituents-of-concern with the Groundwater Protection Standard (GWPS) at the Point-of-Compliance (POC) and boundary (BDY) wells.

2.0 OBJECTIVE

The following *Corrective Action Program* has been prepared for the permitted unit (landfill) that will meet the requirements of Alabama Department of Environmental Management (ADEM) Administrative Code R. 335-14-5-.06(11). The objective of the *Corrective Action Program* is to devise a strategy that, when implemented, will minimize or prevent the further migration of monitored volatile organic contaminants and limit human and environmental exposure to acceptable risk levels of these contaminants.

3.0 CORRECTIVE ACTION PROGRAM

The *Corrective Action Program* was initiated in response to the presence of several volatile organic compounds in groundwater in concentrations that exceeded their respective GWPS listed in the Post-Closure Care Permit.

The *Corrective Action Program* consists of:

Institutional Controls;

- Active institutional controls;
- Passive institutional controls;

Hydraulic Control;

- Implement hydraulic control of the groundwater in the vicinity of the POC;
- Perform semi-annual Corrective Action Monitoring to demonstrate the effectiveness of the corrective action measures;
- Conduct a comparison of the groundwater analytical data to the GWPS referenced in the Post-Closure Care Permit Condition III.B.3.a.;
- Perform statistical analysis on the Corrective Action Monitoring data on an annual basis to determine the effectiveness of the corrective action; and
- Prepare a semi-annual report documenting the corrective action, in general accordance with ADEM Administrative Code R. 335-14-5-.06(11).

Implementation of the Institutional Controls was described in the previously-submitted *Landfill Closure Certification*. Hydraulic Control was initiated under the proposed *Interim Measures (IM) Workplan*, *IM Workplan (Revision 1.0)* and *IM Workplan (Revision 2.0)*, which were previously submitted to the Department.

3.1 Institutional Controls

Institutional controls implemented at the North Birmingham Pipe Plant include two types: active institutional controls and passive institutional controls. Active institutional controls include: (a) installation and maintenance of the landfill cap; (b) control of access to the landfill; and (c) a maintained security fence. Passive institutional controls include: (a) signs; (b) deed restrictions; and (c) land-use controls.

Specific information on the landfill closure is presented in the previously-submitted *Landfill Closure Certification* [Environmental Management & Engineering (EME), revised 1993].

The initial active institutional control implemented for this site was installation of a final cover (landfill cap) on the landfill, and the landfill closure. The final closure surface of the landfill was constructed utilizing the general foundry waste produced at the North Birmingham Pipe Plant.

Tests on this material indicated that it had a permeability of 5.86 x 10^{-6} cm/sec, which is less than the permeability of the local subsoil (calculated to be 1.64 x 10^{-5}). These values indicate that the compacted waste material complied with requirements of 40 CFR 265.310(a) (per EME, revised 1993). A minimum of 3 feet of final cover material was placed on the landfill for closure.

Other active institutional controls include an 8-foot high security fence that encompasses the landfill.

Passive institutional controls have also been implemented at the site. Signs are placed around the landfill, which read: "Danger, Unauthorized Personnel Keep Out," and "Danger, Authorized Personnel Only." In addition, a certified survey plat has been filed with the Birmingham Zoning Board and a "Declaration of Restriction" regarding land use was recorded with the property deed at the Jefferson County Probate Court.

3.2 Hydraulic Control

3.2.1 Hydraulic Control Wells

Five hydraulic control wells designated RW-1 through RW-5 were installed at the site between January 1999 and January 2001. These wells were installed using the air rotary method of drilling at the locations illustrated in Figure D-1. The following procedures were used during the drilling and well installation operations:

- Each borehole was advanced to the top of bedrock, which ranged from 15 to 21 feet below land surface (bls);
- Temporary 10-inch-diameter steel surface casing was installed to the top of bedrock in each borehole to prevent unconsolidated material from collapsing into the borehole during and after drilling;
- Each borehole was then advanced to a total depth of approximately 40 feet;
- After completion of drilling, each well was constructed using Schedule 40 PVC screen and riser. The screens were 0.010-inch factory slotted and 30 feet in length. Schedule 40 riser was attached to the top of each screen and extended upward to approximately 0.5 feet bls. Recovery wells RW-1, RW-4, and RW-5 are 4-inch diameter wells, and recovery wells RW-2 and RW-3 are 6-inch diameter wells.
- A filter pack of clean silica sand, sized for the screen slot opening, was placed in the annular space around the screen from the bottom of the boring to approximately two feet above the top of the screen. The temporary surface casing was pulled back from the borehole as the sand was placed in the borehole, to prevent unconsolidated formation materials and soil from sloughing into the borehole, and to allow the sand pack to maintain its integrity during well installation. Approximately 10 feet of the surface casing was permanently grouted into place in borehole RW-3 to stabilize the borehole.

- The remaining annulus was filled with pellets of bentonite to a level within 2 feet of land surface and hydrated with water.
- Each well was completed with a watertight locking cap and a flush-mounted 17-inch by 17-inch locking protective steel vault.

Boring logs for the hydraulic control wells, including construction data, are presented in Appendix D-A. Table D-1 includes the hydraulic control well number, type, latitude, longitude, regulatory unit(s) recovered, depth, ground elevation, top-of-casing elevation, and screened interval.

It has been determined that RW-2 and RW-3 are not necessary for obtaining hydraulic control of the groundwater plume; therefore, we are proposing that they be properly abandoned as part of the permit renewal. Upon ADEM's approval of permit renewal, RW-2 and RW-3 will be properly abandoned in accordance with the current Alabama Environmental Investigation and Remediation Guidance (AEIRG) document.

3.2.2 Hydraulic Control System Equipment

The hydraulic control system consists of the following:

- Bottom-filling, pneumatic-controlled, float-activated, total fluid pumps;
- Air compressor (currently one main and one backup compressor);
- Pneumatic air intake and exhaust lines;
- Fluid discharge lines;
- Above-ground steel settling tank containing a float-activated sump pump;
- Two liquid-phase carbon filter vessels; and
- Underground piping leading to discharge point.
- Two 2-inch inside-diameter PVC pipelines, which are buried approximately two feet below grade running from the second carbon filter vessel to the spray pond. One pipe is currently in use and the second line was installed for backup use.

3.2.3 Hydraulic Control System Installation

The hydraulic control system was installed January 18 through January 26, 1999, and modified in January 2001. Additional modifications were made in 2012 after the plant was closed and razed. A general layout of the hydraulic control system is provided in Figure D-2. The hydraulic control system consists of five recovery well locations (designated RW-1, RW-2, RW-3, RW-4, and RW-5). Pneumatic pumps, total fluid pumps are used to extract groundwater and prevent groundwater contaminants from migrating off-site. Extracted groundwater is pumped to an above-ground tank that is segmented to allow for any solids to settle out. The water is periodically pumped to a bag filter followed by two carbon filters. The treated water is then discharged to the spray pond.

3.2.4 Hydraulic Control System Startup

The hydraulic control system was activated on January 27, 1999. The compressor and associated air lines, water-discharge lines, manifolds and regulators were initially monitored on an hourly basis over an eight-hour period. The system was then checked daily for the following two weeks, with subsequent weekly checks. Operation and maintenance aspects of the overall system are described in Section 3.2.6 below. Figure D-3 illustrates the potentiometric surface prior to system start up on January 26, 1999, and Figure D-4 illustrates the potentiometric surface on January 28, 1999 after hydraulic control began.

3.2.5 Hydraulic Control Performance

The U.S. EPA document *Methods for Monitoring Pump-and-Treat Performance* (EPA/600/R-94/123, June 1994) presents several objectives, goals, and evaluation criteria for hydraulic control of contaminated groundwater plumes. The selection of the corrective action objectives depends on site conditions and remediation goals. Hydraulic containment is preferred where restoration is technically impracticable due to the presence of buried waste (EPA/600/R-94/123, June 1994).

Based on groundwater modeling and site observations, hydraulic control can be achieved using recovery wells RW-1, RW-4, and RW-5 currently in place on the site, and depending on pumping rates, hydraulic control may be obtained using fewer wells. Figure D-5 shows the potentiometric surface and capture zone model based on water level data obtained during September 2017. During the September 2017 measurement event, groundwater from recovery wells RW-2 and RW-3 was not being pumped. During initial operations, the discharge hose in recovery well RW-2 clogged with scale in the timeframe of a month; therefore, RW-2 did not prove useful in hydraulic control. The results of the pumping test were previously submitted to the Department. The modeling performed indicates complete capture of the water flowing through the landfill with RW-2 and RW-3 offline. Since we are able to maintain plume control without recovery wells RW-2 and RW-3, we are requesting permission to properly abandon RW-2 and RW-3. The pumps in these wells are designed to keep a continuous depression in the water table to the depth of the pump intake. As part of the semi-annual reporting requirements, the following information will be provided to the Department:

- The run time/shut down time for the pumps in each well;
- The total volume of water pumped during the period; and
- An updated model will be provided each year.

3.2.5.1 Potentiometric Surface Determinations

Groundwater-elevation measurements relative to the top-of-casing elevation will be collected from every site monitoring well and recovery well on a semi-annual basis. This information will be used to compare with the modeling data to assure plume capture from the landfill.

The primary goal of the corrective action at this site is plume containment. In general, plume containment is achieved when the affected volume of the aquifer ceases to expand. Potentiometric surface maps for groundwater measurements taken on January 26, 1999 (just prior to the January 27, 1999 startup), a day after startup on January 28, 1999 and on September 13, 2017, are presented as Figures D-3 through D-5. Please note that the groundwater elevations for the wells RW-1 through RW-3 were estimated on January 28, 1999 based on the known depths to the pump intakes (approximately 14 feet below ground surface), and visual observations in the wells. Please note that hydraulic control wells RW-4 and RW-5 were not installed until January 2001. The intermediate groundwater flow regime was rapidly altered by the hydraulic control system as shown in Figures D-3 through D-5. The flow gradient was effectively reversed in the area of the hydraulic control wells, so as to capture down-gradient and side gradient groundwater. Based on the apparent groundwater area of influence of the hydraulic control wells after the initiation of pumping, it appears that the contaminant plume emanating from the landfill can be effectively contained while natural attenuation by biodegradation occurs.

3.2.5.2 Risk-Based Screening Assessment for Boundary Monitoring Wells

The EPA document *Institutional Controls in Risk-Based Corrective Actions* (Kevin Kratina, www.epa.gov/swerust/rbdm/istctrl.htm) states "as an alternative to cleaning a site to levels that would be considered 'safe' for unrestricted use, an institutional control can provide notice of exposure elimination, system maintenance (e.g., engineering control, capping), or land-use constraints (e.g., nonresidential use only)." Institutional (Section 3.1.) and engineering controls (Section 3.2.) have been implemented at the site to prevent further migration of the contaminant plume. Therefore, RBTLS have been calculated for the current land use and resource use at the site to serve as upper-limit trigger values (Refer to Section 4.6.2.).

The Gallet & Associates, Inc. document dated July 16, 2004 (Appendix D-B) contains calculated RBTLs levels for trichloroethene (TCE), cis-1,2-dichloroethene (DCE), 1,1-Dichloroethene (DCE), trans-1,2-DCE, and vinyl chloride (VC) based on the ARBCA Guidance Document (revised June 2007). The assumptions used to calculate the RBTLs are presented in Appendix D-B. Conservative assumptions were used during the calculation of the RBTLs and they are documented in Appendix D-B. The RBTLs calculated for the site are:

cis-1,2-DCE ..... 23.40 mg/L
trans-1,2-DCE..... 0.34 mg/L
1,1-DCE..... 0.13 mg/L
TCE ..... 15.60 mg/L
VC..... 1.77 mg/L

It should be noted that current data from all BDY wells indicate the concentrations of these constituents are below their respective RBTLs. The RBTLs will be compared to groundwater constituent concentrations in the BDY wells. If the BDY well concentrations are less than the

RBTLs, the groundwater leaving the site does not pose an unacceptable risk to human health and the environment. A discussion of the role of the calculated RBTLs (e.g., upper-limit trigger values) in the *Corrective Action Program* is presented in Section 4.6.2. below.

3.2.6 Operation and Maintenance of Hydraulic Control System

The hydraulic control system was initially checked no less than daily for the first two weeks of operation, to ensure it was functioning properly. The hydraulic control system will be inspected at a minimum of every two weeks.

The operation and maintenance of the system will be conducted according to the manufactures guidelines for the equipment being used. Equipment manufactures operation and maintenance guides will be retained onsite in the compressor building.

3.2.7 Health and Safety Plan

Terracon has prepared a *Site-Specific Health and Safety Plan* for use at the North Birmingham Pipe Plant for activities associated with the *Corrective Action Program*. A copy of the *Site-Specific Health and Safety Plan* is included as Appendix D-C. A copy of the *Site-Specific Health and Safety Plan* will be stored in a three-ring binder in the onsite compressor building.

3.2.8 Contingency Plan

In case of an emergency, such as broken or disconnected pipes or lines, water leaks, frayed wiring, or any unusual noise, the system will be immediately shut down, and the site will be secured.

Prior to performing repairs, personnel will review the *Site-Specific Health and Safety Plan* (Appendix D-C), and then consult the *manufactures manuals*. Repair of hydraulic control system equipment will be performed in general accordance with the manufacturer's specifications.

4.0 CORRECTIVE ACTION MONITORING

The Corrective Action Monitoring will be conducted in general accordance with ADEM Administrative Code R. 335-14-5-.06(11)(d). The sections presented below outline the collection and analysis of groundwater samples and the general reporting requirements of the Corrective Action Monitoring. In addition, the Corrective Action Monitoring includes:

- Collection of groundwater elevation data;
- Comparison of groundwater concentrations of constituents-of-concern at the POC with the groundwater protection standards (GWPS); and

- Comparison of groundwater concentrations of constituents-of-concern at the BDY wells with the RBTLs.

4.1 Monitoring Wells

A total of 25 monitoring wells are currently located on the site (Figure D-1 and Table D-2). These wells include: one background (BKG) monitoring well MW-5R; five point-of-compliance (POC) monitoring wells MW-1R, MW-2R, MW-2BR, MW-2C, and MW-3R; four effectiveness (EFF) monitoring wells MW-6, MW-8, MW-12, and MW-13; nine boundary (BDY) monitoring wells MW-7, MW-8B, MW-8C, MW-9, MW-9B, MW-14, MW-15, MW-16, and MW-17; and, four piezometer and/or general Monitoring (PGM) wells. Table D-2 includes the monitoring well number, type, latitude, longitude, regulatory unit(s) monitored, depth, ground elevation, top-of-casing elevation, screened interval, and monitored zone. These monitoring wells are constructed of 2-inch-I.D. PVC. Boring logs, including monitoring well construction schematics, are included as Appendix D-A.

During the March semi-annual sampling events, the BKG, POC, EFF, and BDY wells will be sampled. During the September semi-annual sampling events, the BKG, POC, and EFF wells will be sampled. This is consistent with the current permit.

The monitoring wells (PGM) not proposed for sampling during Corrective Action Monitoring will be maintained in good condition, and will be utilized for collection of groundwater level measurements (Refer to Section 4.4., below). Collection of groundwater samples for analysis from these wells would impart significant additional costs to the *Corrective Action Program* while generating data with little or no value, since:

- The data would provide no additional information on the vertical or lateral extent of contaminants;
- The data would not assist in evaluating the effectiveness of the *Corrective Action Program*;
- The data would not assist in quantifying the risk of contaminant migration.

However, by maintaining the integrity of these wells, they may be re-incorporated into the monitoring program if site conditions change (i.e. during Compliance Monitoring or Detection Monitoring).

In addition to the monitoring wells, five groundwater recovery wells (designated RW-1 through RW-5) were installed for hydraulic control. The installation of these wells is described in Section 3.2.1., above. Two of these wells (RW-2 and RW-3) have been proposed for abandonment.

4.2 Monitored Constituents

The constituents presented in Table D-3 are the Groundwater Quality Monitoring Constituents proposed for analysis of groundwater samples collected from the listed BKG, POC, EFF, and BDY wells during the Corrective Action Monitoring. The constituents listed in Table D-3 are consistent with the Groundwater Quality Monitoring Constituents presented in Table III.2. of the current *Post-*

The constituents proposed in Table D-4 (Table III.2 of the current permit) are proposed for both sampling events (March and September) since this is Corrective Action Monitoring. In addition, none of the constituents listed in Table III.3 of the current permit that are not listed on Table III.2 have been detected during the last 10 years. If the site moves to Compliance or Detection Monitoring in the future, then a permit modification will be requested and the longer list of constituents (Permit Table III.3 or Appendix IX) will be proposed.

4.3 Groundwater Protection Standards

The GWPS for the constituents are also listed in Table D-3. The GWPS are based on current US EPA maximum contaminant levels (MCLs) or Region 4 regional screening levels (RSLs) for tapwater (November 2017).

4.4 Water-Level and Field Parameter Measurements

The depth to groundwater in each of the 25 maintained monitoring wells and the five recovery wells will be measured semi-annually using a decontaminated electronic water-level indicator. The groundwater level will be measured from the top-of-casing (TOC) of each well, which is surveyed relative to mean sea level. The TOC elevations are presented on Table D-1 and Table D-2. A groundwater elevation will then be calculated by subtracting the measured depth to groundwater from the TOC elevation. Potentiometric surface maps for each set of groundwater elevations will be prepared and submitted during reporting (Section 4.8, below).

Field parameters to be measured in the groundwater samples collected from the monitoring wells during the Corrective Action Monitoring include those listed in Table D-4. These field parameters include temperature, specific conductance, and pH as described in Condition III.E.3.c.of the current *Post-Closure Care Permit*. Tables will be prepared for the field parameter data and submitted during reporting (Section 4.8, below).

4.5 Monitoring Requirements

During implementation of the *Corrective Action Program*, Corrective Action Monitoring will be performed. One groundwater sample will be collected during the Corrective Action Monitoring from the BKG, POC, EFF, and BDY monitoring wells listed on Table D-3 during the March sampling event, and from the BKG, POC, and EFF monitoring wells during the September

sampling event (as stated in the current permit). Each groundwater sample collected from the wells during the Corrective Action Monitoring will be analyzed for the constituents listed in Table D-3. The field parameters listed in Table D-4 will also be measured for each groundwater sample collected.

In addition to the groundwater samples, a trip blank, a rinse blank, and a duplicate sample will be collected as quality assurance samples. The trip blank will be analyzed for the volatile organic compounds listed in Table D-3. The rinse blank and duplicate sample will be analyzed for all of the constituents listed on Table D-3. Sampling and analytical procedures will follow the plan outlined in *Post-Closure Care Permit* Condition III.B.5 and Appendix D of the *Part B Application for Post-Closure Care*.

4.6 Analytical Results

Analytical data will be tabulated upon receipt of the laboratory reports. The laboratory reports and tabulated analytical data will be prepared and submitted during reporting (Section 4.8., below). After tabulation, the analytical data will then be compared to the GWPS and the RM-2 levels (Appendix D-B), as appropriate.

4.6.1 Comparison to Groundwater Protection Standards

The analytical data from the groundwater collected from each monitoring well will be compared to the GWPS. Corrective action will continue until the constituent concentrations in the POC wells are below the GWPS for a period of three years. Subsequently, the Department will be notified, and a *Request for Post-Closure Permit Modification* to discontinue the Corrective Action Program will be prepared and submitted.

The comparison of POC groundwater data to the GWPS will be presented during routine reporting (Section 4.8., below).

4.6.2 Comparison to RM-2 Levels

As stated above in Section 4.0, the analytical data from the groundwater samples collected from the BDY wells (Table D-2) will be compared to the RM-2 levels presented in Appendix D-B. If the constituent concentrations at all BDY wells are less than the RM-2 levels, the *Corrective Action Program* as described herein will continue. However, if any constituent concentration in any BDY well exceeds its RM-2 level, the well will be resampled to confirm the exceedance. If the confirmatory sample also indicates a constituent concentration exceeding the RM-2 level, the Department will be notified within 7 days of receipt of confirmatory analytical data. The Department will then be consulted and a Corrective Measures Study or other appropriate action(s) will be performed. The additional corrective action measures may include: (1) the addition of more hydraulic control wells; (2) soil vapor extraction and air sparging; (3) enhanced

bioremediation; (4) new technologies determined to be suitable for the site; or (5) development of non-default site-specific risk-based facility boundary concentrations.

The comparison of the groundwater data to the RM-2 levels will be presented during routine reporting (Section 4.8., below).

4.6.3 Effectiveness Wells

The analytical data from the groundwater collected from each of the EFF wells will be graphed to determine if increasing or decreasing trends can be observed. The data obtained from these trends may be used to modify pumping rates or other adjustments to the hydraulic control system so that capture of the plume is maintained. Possible adjustments include repositioning of the pumps in the recovery wells, placing additional pumping wells online, or other such modification to the system.

4.7 Statistical Analysis

The effectiveness of the *Corrective Action Program* will be assessed in general accordance with ADEM Administrative Code 335-14-5-.06(11)(d) by statistical studies of the groundwater samples collected from the monitoring wells listed in Table D-2. Guidance on statistical procedures to be employed during the *Corrective Action Program* will be drawn from the EPA document *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance* (March 2009, *EPA 530/R-09-007*), any of its successor documents, and/or other pertinent literature. Groundwater samples will be collected and analyzed on a semi-annual sampling schedule. Annually, as presented in the EPA document *PB94-138815* (Chapter 5), both sets of semi-annual data will be statistically analyzed by methods appropriate to the characteristics of the distribution of the analytical data and the known sensitivity of the statistical methods to violations of method assumptions (i.e., parametric procedures will be employed unless otherwise indicated).

The statistical analysis conducted during the Corrective Action Monitoring (described above) is based on analysis of an annual database. The statistical analysis will be presented during routine reporting on an annual basis (Section 4.8., below).

4.8 Reporting and Response Requirements

In addition to the recordkeeping and reporting requirements specified in Condition III.B.6. of the *Post-Closure Care Permit*, a *Corrective Action Effectiveness Report* will be submitted to the Department semi-annually (May and November, 60 days after collection of the semi-annual groundwater samples), pursuant to ADEM Administrative Code R. 335-14-5-.06(11)(g). Each semi-annual report will contain analytical data, field parameter measurements, water-level measurements, and hydraulic control information collected during the reporting period. Statistical

analysis will be reported on an annual basis during the semi-annual report that will be submitted to the Department in May of each year.

5.0 FINANCIAL ASSURANCE

Financial assurance forms have been prepared as required by ADEM Administrative Code R. 335-14-5-.06(11)(i) and are included in Appendix G of the *Part B Post-Closure Care Permit Application*. These financial assurance calculations include implementation of the *Corrective Action Program*. Within 90 days of the Department's approval, a letter of credit or other approved financial assurance mechanism will be secured.

6.0 REFERENCES

Alabama Department of Environmental Management Administrative Code R. 335-14-8 (Rev. 03/31/17).

Alabama Department of Environmental Management Administrative Code R. 335-14-5 (Rev. 03/31/17).

Alabama Environmental Investigation and Remediation Guidance (AEIRG), (Rev. 4, 2/17)

Bouwer, E.J., 1994, *Bioremediation of Chlorinated Solvents Using Alternate Electron Acceptors*. Handbook of Bioremediation, Lewis Publishers, Boca Raton, Florida.

Ellis, D.E., et.al., 1996, *Remediation Technology Development Forum, Intrinsic Remediation Project at Dover Air Force Base, Delaware*. Symposium on Natural Attenuation of Chlorinated Organics in Groundwater, Dallas, Texas.

Kleka, G.M., et.al., 1997, *Intrinsic Bioremediation of Chlorinated Ethenes at Dover Air Force Base*, In: *In Situ and On-Site Bioremediation*: Volume 3, Battelle Press.

Kratina, Kevin, *Institutional Controls in Risk-Based Corrective Actions*, U.S. Environmental Protection Agency.

Malander, Mark, *Selection of Carcinogenic Target Risk Levels for Soil and Groundwater Remediation*, U.S. Environmental Protection Agency.

McCarty, P.L. and Semprini, L., 1994, *Groundwater Treatment for Chlorinated Solvents*, In: Handbook of Bioremediation, Lewis Publishers, Boca Raton, Florida.

Rogers, John, B. Johnson and H. Lacayo, July 1992, *Methods for Evaluating the Attainment of Cleanup Standards, Volume 2: Ground Water*, U.S. Environmental Protection Agency, PB94-138815.

U.S. Environmental Protection Agency, 1997, *Draft Region 4 Approach to Natural Attenuation of Chlorinated Solvents*, 23 p.

U.S. Environmental Protection Agency, March 2009, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance. EPA 530/R-09-007.*

Weidemeier, T.H., et. al., 1996, *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*, Air Force Center for Environmental Excellence, Brooks Air Force Base, San Antonio, Texas.

Weidemeier, T.H., et. al., 1995, *Technical Protocol for Implementing Intrinsic Remediation With Long-Term Monitoring for Natural Attenuation of Fuel Contamination Dissolved in Groundwater: Volumes I and II,* Parsons Engineering Science, Inc., Denver, Colorado.

In addition, other documents incorporated within these above-referenced documents are referenced by inclusion.

Table D-1. Hydraulic Control Well Designation
Mueller Property Holdings, LLC - Birmingham, Alabama

Well Number	Well Type	Well Latitude	Well Longitude	Unit(s) Recovered	Well Depth (ft)	Ground Elevation (ft. MSL)	TOC Elevation (ft. MSL)	Screened Interval (ft BLS)	Zone/Aquifer*
RW-1	HCW	33 33 16.361N	86 48 33.545W	Landfill	40	574.16	572.68	10-40	Conasauga Fm./Knox-Shady
RW-2	HCW	33 33 15.787N	86 48 34.307W	Landfill	40	575.94	574.69	10-40	Conasauga Fm./Knox-Shady
RW-3	HCW	33 33 16.121N	86 48 35.807W	Landfill	40	576.74	575.44	10-40	Conasauga Fm./Knox-Shady
RW-4	HCW	33 33 16.740N	86 84 32.820W	Landfill	40	573.32	572.93	10-40	Conasauga Fm./Knox-Shady
RW-5	HCW	33 33 16.500N	86 48 33.060W	Landfill	40	573.40	572.98	10-40	Conasauga Fm./Knox-Shady

HCW = Hydraulic Control Wells
MSL = Mean Sea Level
BLS = Below Land Surface

*** Also referred to as the "Valley and Ridge Aquifer System"**

Table D-2. Monitoring Well Designation
Mueller Property Holdings, LLC - Birmingham, Alabama

Well Number	Well Type	Well Latitude	Well Longitude	Unit(s) Monitored	Well Depth (ft BTOC)	Ground Elevation (ft. MSL)	TOC Elevation (ft. MSL)	Screened Interval (ft BLS)	Monitored Zone/Aquifer*
MW-1R	POC	33 33 18.21N	86 48 33.46W	Landfill	23.46	573.52	576.51	11-21	Conasauga Fm./Knox-Shady
MW-2R	POC	33 33 16.30N	86 48 33.67W	Landfill	31.12	574.30	576.95	19-29	Conasauga Fm./Knox-Shady
MW-2BR	POC	33 33 16.07N	86 48 34.02W	Landfill	129.97	574.30	575.28	125-130	Conasauga Fm./Knox-Shady
MW-2C	POC	33 33 15.88N	86 48 33.58W	Landfill	124.95	574.43	576.90	202.8-222.8	Conasauga Fm./Knox-Shady
MW-3R	POC	33 33 17.07N	86 48 37.36W	Landfill	32.68	576.49	579.69	21-31	Conasauga Fm./Knox-Shady
MW-5R	BKG	33 33 24.79N	86 48 35.84W	Landfill	26.80	577.54	580.39	19-29	Conasauga Fm./Knox-Shady
MW-6	EFF	33 33 13.35N	86 48 33.37W	Landfill	23.72	572.79	574.58	12-22	Conasauga Fm./Knox-Shady
MW-7	BDY	33 33 11.98N	86 48 32.91W	Landfill	28.13	571.67	574.72	16-26	Conasauga Fm./Knox-Shady
MW-8	EFF	33 33 14.30N	86 48 35.25W	Landfill	23.64	574.20	577.19	11.5-21.5	Conasauga Fm./Knox-Shady
MW-8B	BDY	33 33 14.35N	86 48 35.47 W	Landfill	123.94	574.86	576.81	115-125	Conasauga Fm./Knox-Shady
MW-8C	BDY	33 33 14.35N	86 48 35.64W	Landfill	224.82	575.00	577.02	215-225	Conasauga Fm./Knox-Shady
MW-9	BDY	33 33 15.90N	86 48 32.22W	Landfill	23.74	571.79	574.73	11.5-21.5	Conasauga Fm./Knox-Shady
MW-9B	BDY	33 33 15.95N	86 48 32.11W	Landfill	124.46	572.15	574.11	115-125	Conasauga Fm./Knox-Shady
MW-10	PGM	33 33 16.63N	86 48 32.04W	Landfill	21.33	571.29	574.65	7-17	Conasauga Fm./Knox-Shady
MW-11	PGM	33 33 14.66N	86 48 32.66W	Landfill	19.92	572.24	575.51	8-18	Conasauga Fm./Knox-Shady
MW-12	EFF	33 33 11.14N	86 48 34.95W	Landfill	28.18	572.93	572.78	19-29	Conasauga Fm./Knox-Shady
MW-13	EFF	33 33 12.82N	86 48 37.41W	Landfill	27.84	576.06	579.15	16.5-26.5	Conasauga Fm./Knox-Shady
MW-14R	BDY	33 33 11.26N	86 48 38.05W	Landfill	22.34	575.22	577.83	13-23	Conasauga Fm./Knox-Shady
MW-15	BDY	33 33 12.12N	86 48 31.43W	Landfill	26.56	569.44	571.38	15-25	Conasauga Fm./Knox-Shady
MW-16	BDY	33 33 16.98N	86 48 30.99W	Landfill	27.20	572.81	575.03	15-25	Conasauga Fm./Knox-Shady
MW-17	BDY	33 33 10.31N	86 48 35.16W	Landfill	26.91	571.77	573.81	15-25	Conasauga Fm./Knox-Shady
TW-1	PGM	33 33 19.42N	86 48 33.44W	Landfill	15.18	574.79	574.39	6-16	Conasauga Fm./Knox-Shady
TW-2	PGM	33 33 20.47N	86 48 33.42W	Landfill	15.04	574.91	574.90	6-16	Conasauga Fm./Knox-Shady
TW-3	PGM	33 33 21.81N	86 48 33.43W	Landfill	13.66	575.27	575.24	6-16	Conasauga Fm./Knox-Shady
TW-4	PGM	33 33 24.16N	86 48 33.46W	Landfill	19.20	575.62	575.32	11-21	Conasauga Fm./Knox-Shady

POC = Point of Compliance Wells
BKG = Background Wells
EFF = Effectiveness Wells
BDY = Boundary Monitoring Wells
PGM =Piezometer and/or General Monitoring
MSL = Mean Sea Level
BLS = Below Land Surface

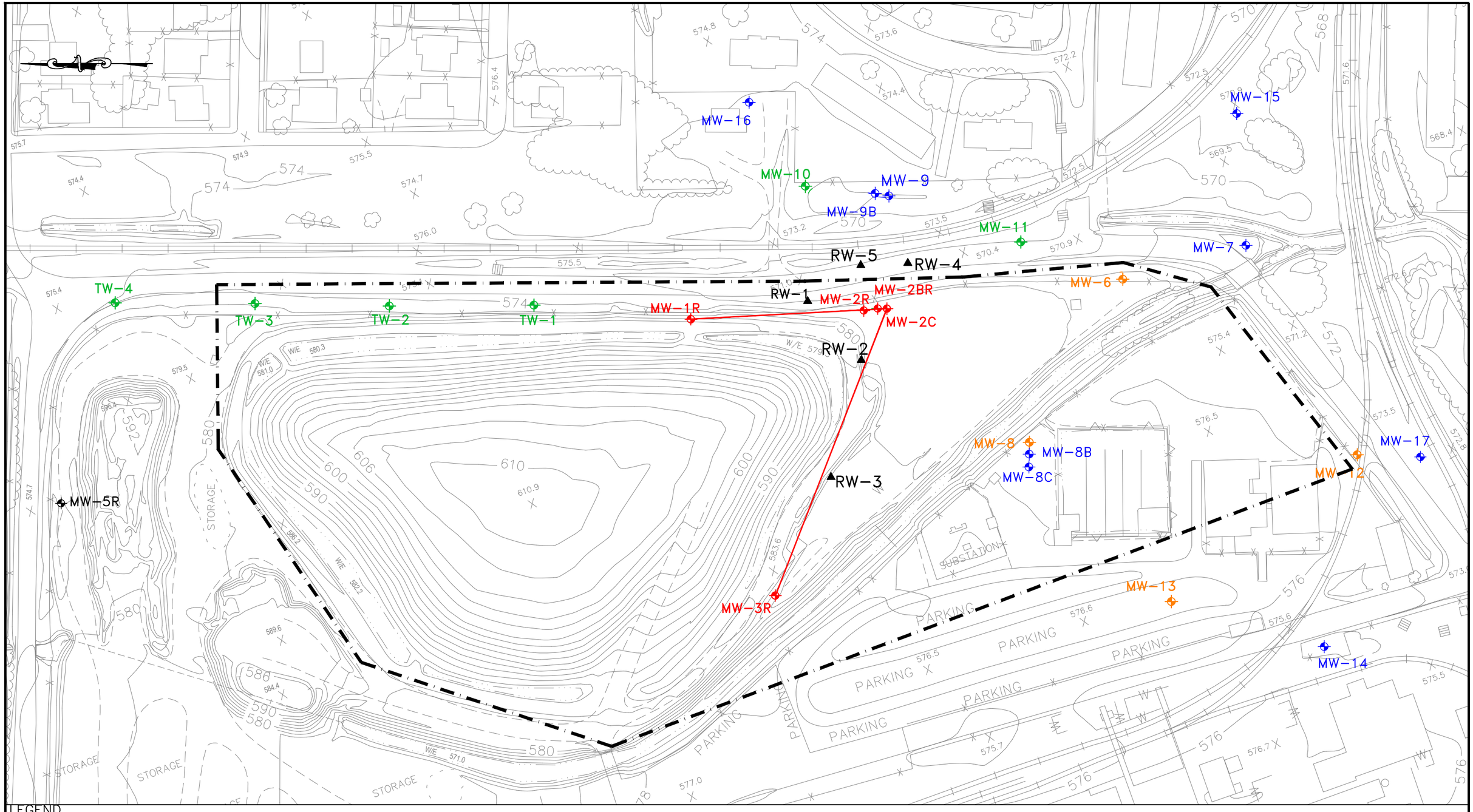
BTOC = Below Top of Casing
Monitoring wells with a "B" and "C" designation represent the deep flow zone
All other wells are installed in the shallow/intermediate flow zone.
*** Also referred to as the "Valley and Ridge Aquifer System"**

Table D-3. Groundwater Quality Monitoring Constituents and Groundwater Protection Standards
Mueller Property Holdings, LLC - Birmingham, Alabama

Hazardous Constituent	Unit	Concentration Limit (mg/L)
Arsenic, total	Landfill	0.01
Barium, total	Landfill	2
Beryllium, total	Landfill	0.004
Cadmium, total	Landfill	0.005
Chromium, total	Landfill	0.1
Copper, total	Landfill	1.3
Lead, total	Landfill	0.015
Nickel, total	Landfill	0.02
Zinc, total	Landfill	0.6
Bis(2-ethylhexyl)phthalate (117-81-7)	Landfill	0.006
1,1-Dichloroethane (75-34-3)	Landfill	0.0028
1,2-Dichloroethane (107-06-2)	Landfill	0.005
1,1-Dichloroethylene (75-35-4)	Landfill	0.007
cis-1,2-Dichloroethylene (156-59-2)	Landfill	0.07
trans-1,2-Dichloroethylene (156-60-5)	Landfill	0.1
1,1,1-Trichloroethane (71-55-6)	Landfill	0.2
1,1,2-Trichloroethane (79-00-5)	Landfill	0.005
Trichloroethylene (79-01-6)	Landfill	0.005
Vinyl Chloride (75-01-4)	Landfill	0.002

Table D-4. Additional Monitoring Parameters
Mueller Property Holdings, LLC - Birmingham, Alabama

Constituent		Location
Temperature	(degrees F or C)	Field
Specific Conductance	(Mhos/cm)	Field
pH	(Standard Units)	Field



LEGEND

- SITE
- BACKGROUND MONITORING WELL
- BOUNDARY MONITORING WELL
- POINT OF COMPLIANCE MONITORING WELL
- EFFECTIVENESS WELL
- PIEZOMETER & GENERAL MONITORING
- HYDRAULIC CONTROL WELL
- POINT OF COMPLIANCE

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR

Project No.	E1187001D
Scale:	AS SHOWN
File No.	E1187001E-1
Date:	MARCH 2018

Terracon
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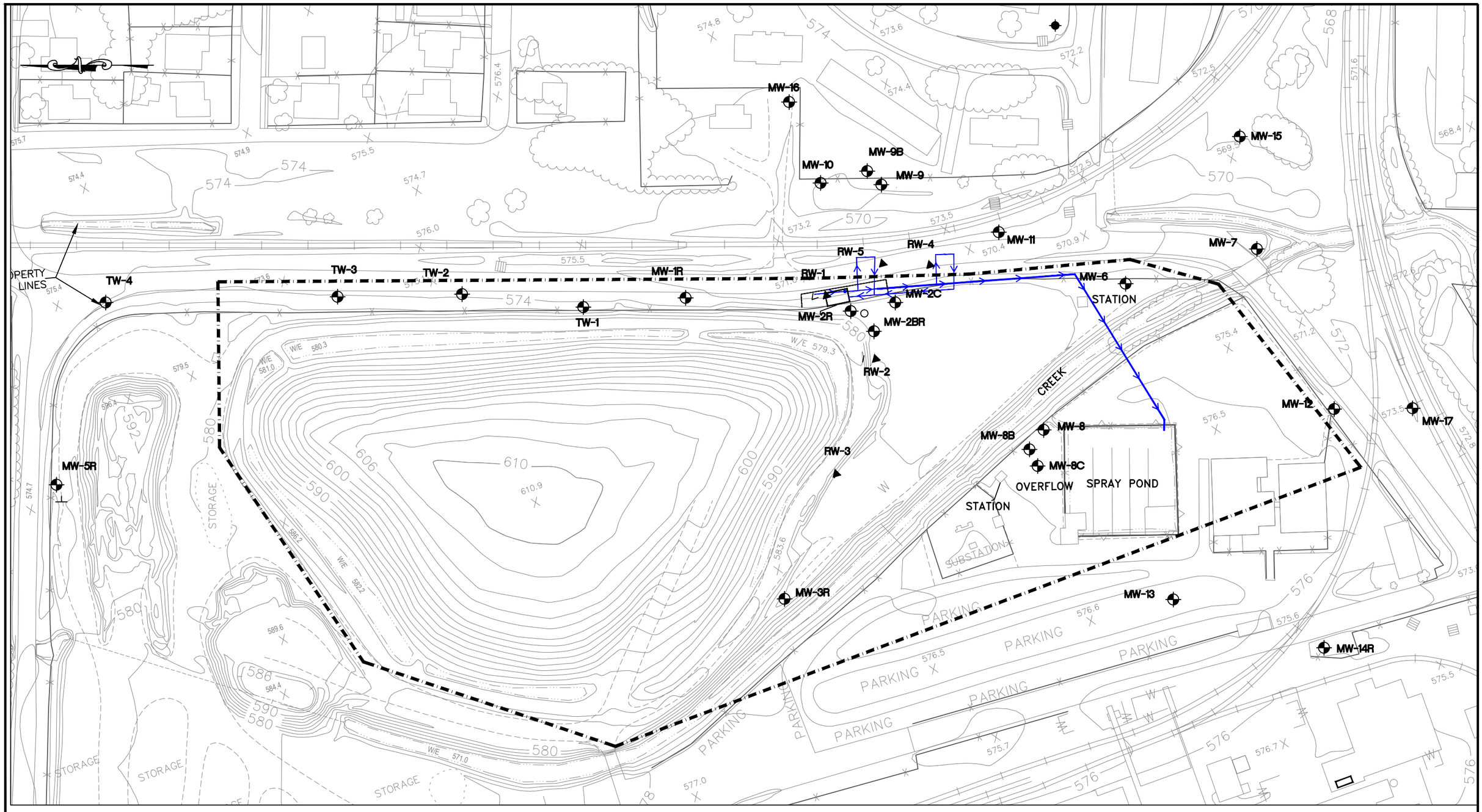
110 12th Street North Birmingham, Alabama 35203
(205) 942-1289 (205) 443-5302

SITE MAP
APPENDIX D
MUELLER PROPERTY HOLDINGS, LLC
SWMU 21 - CLOSED LANDFILL
BIRMINGHAM, AL

FIGURE
D-1



LEGEND

- SITE
- HYDRAULIC CONTROL WELL LOCATION
- MONITORING WELL LOCATION
- WATER DISCHARGE LINE

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR

Project No.	E1187001D
Scale:	AS SHOWN
File No.	E1187001D-2
Date:	MARCH 2018

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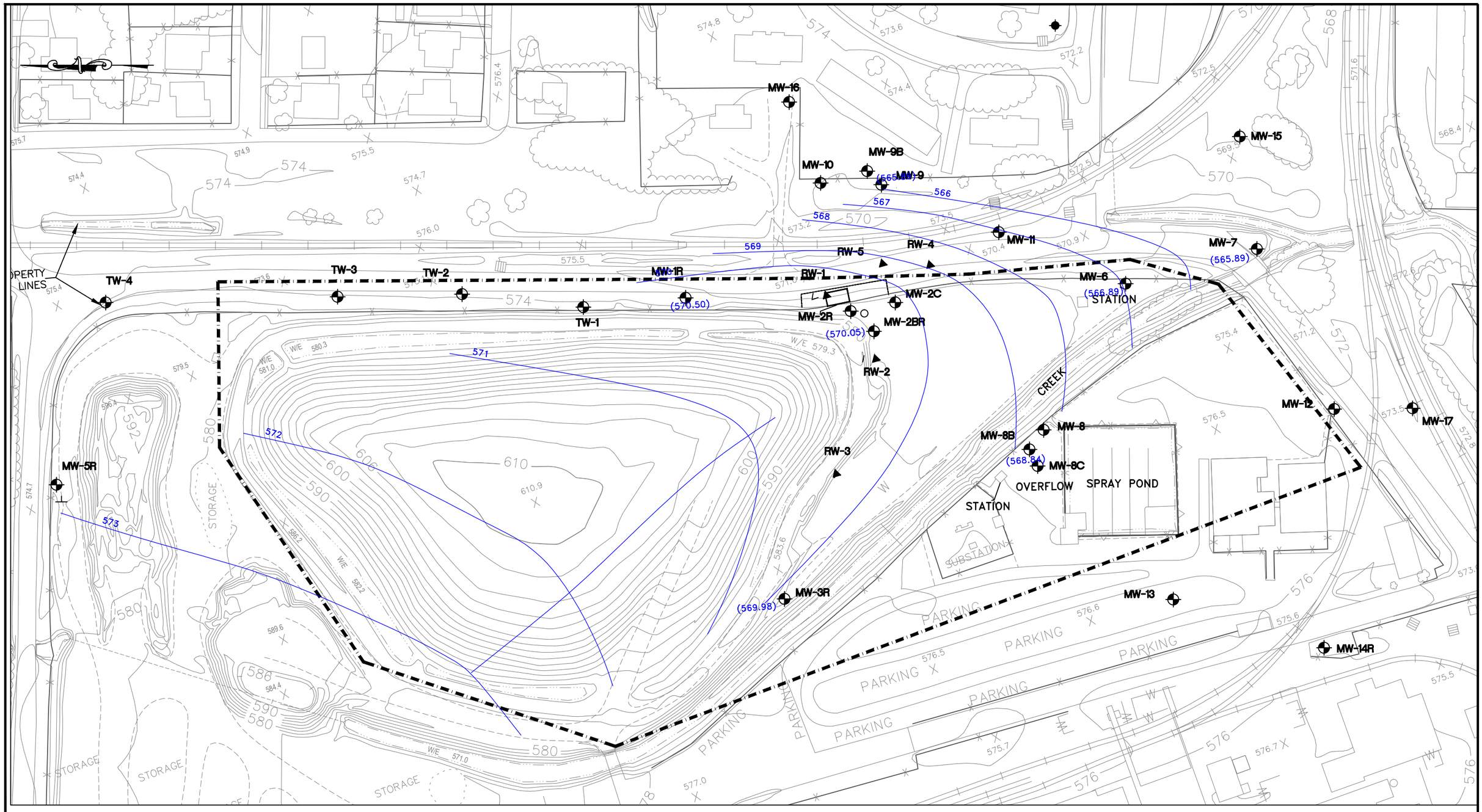
HYDRAULIC CONTROL SYSTEM SCHEMATIC

APPENDIX D
MUELLER PROPERTY HOLDINGS, LLC
SWMU 21 - CLOSED LANDFILL
BIRMINGHAM, AL

FIGURE
D-2



LEGEND

- SHALLOW/DEEP MONITORING WELLS
- RECOVERY WELLS
- TEMPORARY SOIL BORINGS
- TEMPORARY WELLS

WATER DISCHARGE LINE

THIS DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR

Project No.	E1187001D
Scale:	AS SHOWN
File No.	E1187001D-3
Date:	MARCH 2018

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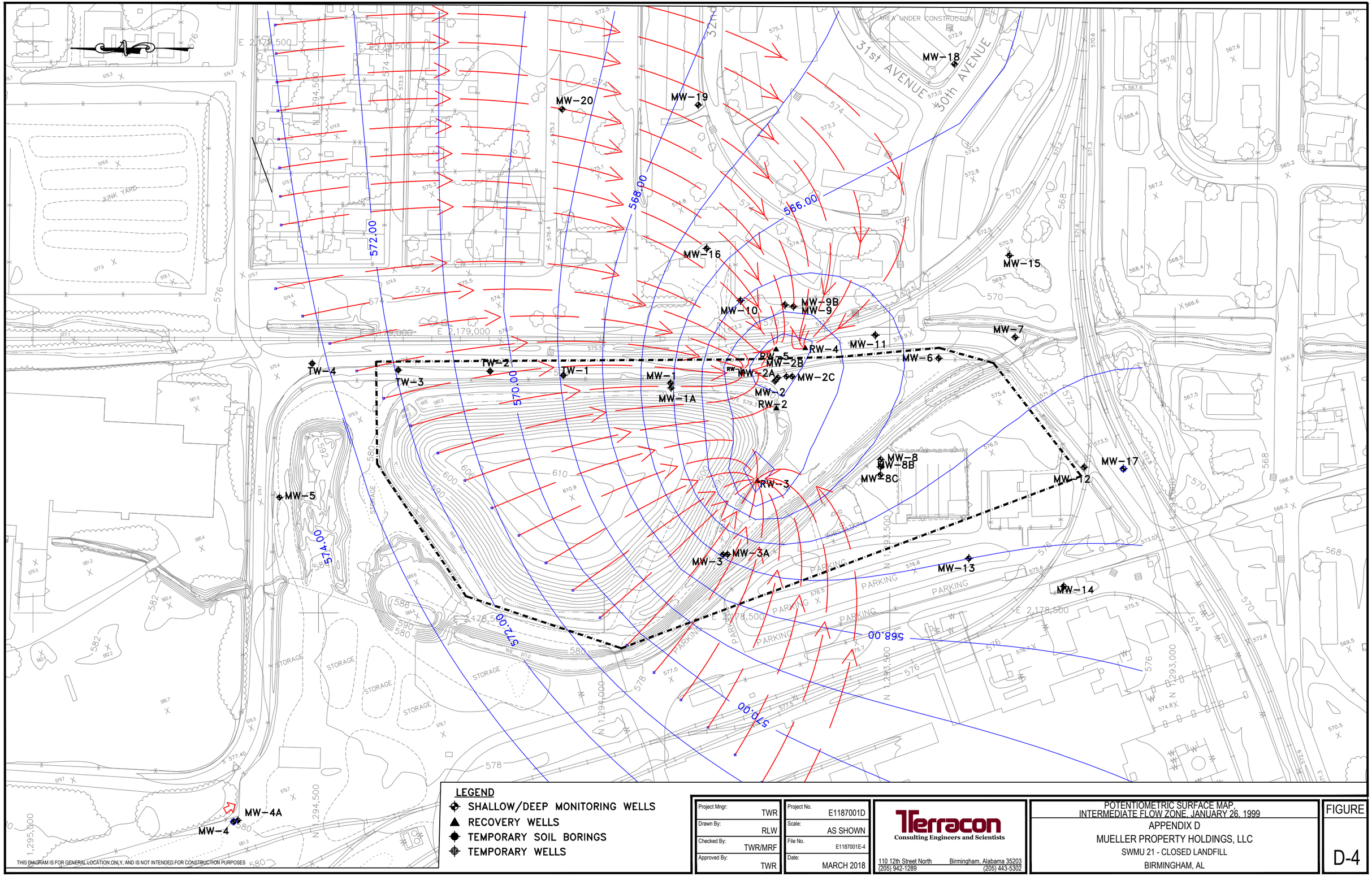
POTENTIOMETRIC SURFACE MAP
INTERMEDIATE FLOW ZONE JANUARY 26 1999
APPENDIX D
MUELLER PROPERTY HOLDINGS, LLC
SWMU 21 - CLOSED LANDFILL
BIRMINGHAM, AL

FIGURE
D-3



LEGEND

- SHALLOW/DEEP MONITORING WELLS
- RECOVERY WELLS
- TEMPORARY SOIL BORINGS
- TEMPORARY WELLS

Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR

Project No.	E1187001D
Scale:	AS SHOWN
File No.	E1187001E-4
Date:	MARCH 2018

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POTENTIOMETRIC SURFACE MAP,
INTERMEDIATE FLOW ZONE, JANUARY 26, 1999
APPENDIX D
MUELLER PROPERTY HOLDINGS, LLC
SWMU 21 - CLOSED LANDFILL
BIRMINGHAM, AL

FIGURE
D-4

MW-16
565.97

MW-9B
566.58

MW-10
566.35

MW-9
565.97

MW-15
562.37

MW-11
567.78

MW-7
564.77

RW-5
552.63

RW-4
553.57

RW-1
552.54

MW-6
566.45

MW-2C
568.86 (NI)

MW-2R
568.64

MW-2BR
565.83 (NI)

MW-1R
568.30

TW-3
574.00

TW-2
570.24

TW-4
573.08

TW-1
569.84

RW-2
NM

RW-3
NM

MW-12
566.14

MW-17
565.31

MW-8B
475.88
(NI)

MW-8
567.67

MW-8C
568.11
(NI)

MW-5R
572.45

MW-3R
569.67

MW-13
567.52

MW-14R
567.60

STORAGE

SUBSTATION

A

LEGEND

- SITE
- MONITORING WELLS
- HYDRAULIC CONTROL WELLS
- NI NOT INCLUDED
- NL NOT LOCATED
- INTERMEDIATE GROUNDWATER FLOW ZONE
- -566- GROUNDWATER CONTOUR
- 567.52 GROUNDWATER ELEVATION
- GENERAL GROUNDWATER FLOW DIRECTION

NOTE: CONTOUR INTERVALS = 2 FEET

Project Mngr:	TWR
Drawn By:	RLW
Checked By:	TWR/MRF
Approved By:	TWR

Project No.	E1187001D
Scale:	AS SHOWN
File No.	E1187001E-5
Date:	MARCH 2018

Terracon
Consulting Engineers and Scientists
110 12th Street North Birmingham, Alabama 35203
(205) 942-1289 (205) 443-5302

POTENTIOMETRIC SURFACE MAP,
INTERMEDIATE FLOW ZONE, SEPTEMBER 13, 2017
APPENDIX D
MUELLER PROPERTY HOLDINGS, LLC
SWMU 21 - CLOSED LANDFILL
BIRMINGHAM, AL

FIGURE
D-5

WELL LOG NO. MW-1R

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

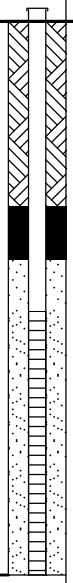
LOCATION See Exhibit A-2

Surface Elev.: 573.52 (Ft.)

GRAPHIC LOG	DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	0	**FOUNDRY SAND**, black, medium to coarse-grained, with pebbles, cobbles, and some boulders of slag	
	5.0		568.5
		SILTY CLAY, tan, high plasticity	
		moist	
	11.5	Hollow Stem Auger Refusal at 11.5 feet bls	562
		LIMESTONE, gray to white	
		Abundant water to boring termination	
	21.0		552.5
		Boring Terminated at 21 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 5' and 11.75'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-26-2005 | Well Completed: 01-26-2005

Drill Rig: | Driller: Technical Drilling Services

Project No.: E1187001 | Exhibit: B-1

WELL LOG NO. MW-2R

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

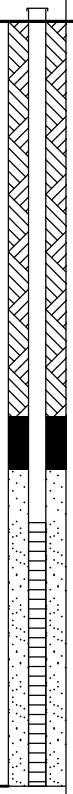
LOCATION See Exhibit A-2

Surface Elev.: 574.3 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.5	**GRASS AND TOPSOIL**	573.8
	FOUNDRY SAND, black, medium to coarse-grained, with pebbles, cobbles, and some silt	
7.0		567.3
	SILTY CLAY, brown, high plasticity	
	wet	
19.0	Hollow Stem Auger Refusal at 19 feet bls	555.3
	LIMESTONE, gray to white	
	Soft areas 23' to 24'	
29.0		545.3
	Boring Terminated at 29 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20, 25

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 6.5' and 12'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-18-2005 | Well Completed: 01-18-2005

Drill Rig: | Driller: Technical Drilling Services

Project No.: E1187001 | Exhibit: B-2

WELL LOG NO. MW-2BR

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

LOCATION See Exhibit A-2

INSTALLATION DETAILS

Well Completion:

Surface Elev.: 574.3 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
2.0	**FOUNDRY SAND**, black, medium to coarse-grained, with some silt	572.3
	SILTY CLAY, brown, little sand, high plasticity	
19.0	Water encountered at soil/rock interface Hollow Stem Auger Refusal at 19 feet bls	555.3
	LIMESTONE, gray to white	
	Surface Casing installed to 40' bls	
	Soft area from 50' to 53'	
	Soft area from 66' to 67'	
	Fracture zone then competent to 115'	
	Fracture zone	
130.0		444.3
	Boring Terminated at 130 Feet	

GRAPHIC LOG | DEPTH (ft) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 10' and 19'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-24-2005 | Well Completed: 01-25-2005

Drill Rig: | Driller: Miller Drilling

Project No.: E1187001 | Exhibit: B-3

WELL LOG NO. MW-3R

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

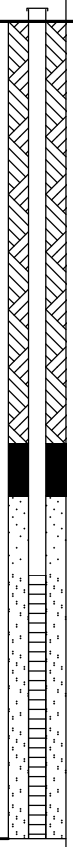
LOCATION See Exhibit A-2

Surface Elev.: 576.49 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.5	**GRASS AND TOPSOIL**	576
	FOUNDRY SAND, black, medium to coarse-grained, some silt	
	very moist	
	wet	
	hard grinding	
16.0		560.5
	SILTY CLAY, brown, high plasticity	
21.0	Hollow Stem Auger Refusal at 21 feet bls	555.5
	LIMESTONE, gray to white	
	Void from 25' to 26'	
31.0		545.5
	Boring Terminated at 31 Feet	

INSTALLATION DETAILS

Well Completion:



GRAPHIC LOG | DEPTH (ft) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 7' and 10'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-18-2005 | Well Completed: 01-18-2005

Drill Rig: | Driller: Technical Drilling Services

Project No.: E1187001 | Exhibit: B-4

WELL LOG NO. MW-5R

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

LOCATION See Exhibit A-2

Surface Elev.: 577.54 (Ft.)

GRAPHIC LOG	DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)	INSTALLATION DETAILS: Well Completion	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE
		FOUNDRY SAND, black, medium to coarse-grained, with pebbles, cobbles of slag					
	11.0		566.5				
		SILTY CLAY, tan to brown-tan, wet					
		Cherty "rubble zone"					
	29.0		548.5				
		Boring Terminated at 29 Feet					

5
10
15
20
25

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 6' and 11'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-17-2005
Well Completed: 01-17-2005
Drill Rig:
Driller: Technical Drilling Services
Project No.: E1187001
Exhibit: B-5

WELL LOG NO. MW-6

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

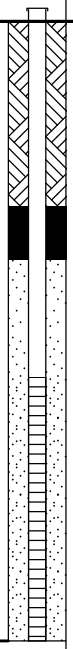
LOCATION See Exhibit A-2

Surface Elev.: 574.34 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0	**FOUNDRY FILL**, black	
6.0		568.3
	SILTY CLAY, orange to red-brown	
13.0		561.3
	LIMESTONE, light to medium-gray, slightly weathered	
23.5		550.8
	Boring Terminated at 23.5 Feet	

INSTALLATION DETAILS

Well Completion:



GRAPHIC LOG | DEPTH (ft) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No water observed

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 10-23-1996 | Well Completed: 10-23-1996

Drill Rig: | Driller:

Project No.: E1187001 | Exhibit: B-6

WELL LOG NO. MW-7

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

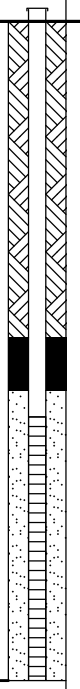
LOCATION See Exhibit A-2

Surface Elev.: 574.34 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	FOUNDRY FILL, black	
3.0	**SILTY CLAY**, orange to red-brown	571.3
22.0		552.3
	LIMESTONE, light to medium-gray, slightly weathered	
25.0		549.3
	Boring Terminated at 25 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20, 25

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No water observed

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 06-20-1997 | Well Completed: 06-20-1997

Drill Rig: | Driller:

Project No.: E1187001 | Exhibit: B-7

WELL LOG NO. MW-8

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

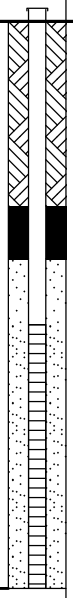
LOCATION See Exhibit A-2

Surface Elev.: 574.34 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.5	**TOPSOIL AND ROOTS**	573.8
	SILTY CLAY, orange to red-brown	
	Changes in color to light brown/tan	
16.5		557.8
	LIMESTONE, light to medium-gray, slightly weathered	
21.5		552.8
	Boring Terminated at 21.5 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20

GRAPHIC LOG | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 6.5'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 08-10-1998 | Well Completed: 08-10-1998

Drill Rig: | Driller: AL Environmental Drilling

Project No.: E1187001 | Exhibit: B-8

WELL LOG NO. MW-8B

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

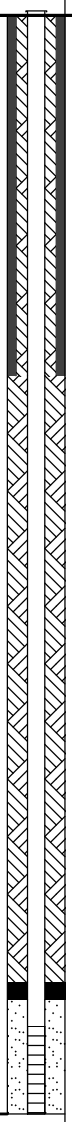
LOCATION See Exhibit A-2

Surface Elev.: 574.68 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	FOUNDRY SAND, black, with slag up to 1" in diameter, medium coarse grained	
	Slag boulder from 3' to 4'	
10.0		564.7
11.0	**SILTY CLAY**, tan to gray	563.7
	LIMESTONE, gray to white	
	Weathered to 22'	
	Soft area 36' to 37'	
	Bottom of well casing at 41'	
	Soft area 52'	
	Soft area 64'	
	Fractured zone 70' to 75'	
	Mud seam at 80'	
	Fracture at 88'	
97.0		477.7
	LIMESTONE, dark gray to black	
102.0		472.7
	LIMESTONE, light gray	
	Fracture at 121'	
125.0		449.7
	Boring Terminated at 125 Feet	

INSTALLATION DETAILS

Well Completion:



GRAPHIC LOG | DEPTH (ft) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No water observed

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 12-06-2001 | Well Completed: 12-07-2001

Drill Rig: | Driller: Miller Drilling

Project No.: E1187001 | Exhibit: B-9

WELL LOG NO. MW-8C

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

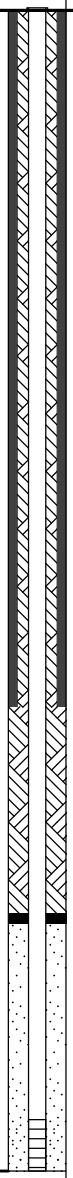
LOCATION See Exhibit A-2

Surface Elev.: 574.41 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	FOUNDRY SAND, black, with slag gravel up to 1" in diameter, medium coarse grained	
10.0		564.4
13.0	Perched water at 9'	561.4
16.0	**SILTY CLAY**, tan to gray	558.4
20.0	**LIMESTONE BOULDER**	554.4
	SILTY CLAY, tan to dark gray	
	LIMESTONE, light to medium gray	
	Low yield water bearing zone at 44'	
	Fractured area from 68' to 70'	
	Low yield water bearing zone at 84'	
	Hard layer from 185.75' to 186' High yield (20gam) water Bearing zone at 186'	
	Possible fracture at 210'	
225.0		349.4
	Boring Terminated at 225 Feet	

INSTALLATION DETAILS

Well Completion:



GRAPHIC LOG | DEPTH (ft) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 6', 9', 44', 84' and 186'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-21-2002 | Well Completed: 01-23-2002

Drill Rig: | Driller: Miller Drilling

Project No.: E1187001 | Exhibit: B-10

WELL LOG NO. MW-9

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

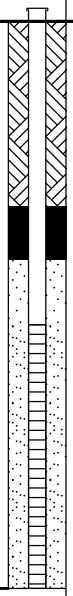
LOCATION See Exhibit A-2

Surface Elev.: 571.64 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.5	**TOPSOIL AND ROOTS**	571.1
	SILTY CLAY, orange to red-brown	
	Changes in color to light-brown/tan	
15.5		556.1
	LIMESTONE, light to medium-gray, slightly weathered	
21.5		550.1
	Boring Terminated at 21.5 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 10'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 08-10-1998
Well Completed: 08-10-1998
Drill Rig:
Driller: AL Environmental Drilling
Project No.: E1187001
Exhibit: B-11

WELL LOG NO. MW-9B

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

LOCATION See Exhibit A-2

INSTALLATION DETAILS

Well Completion:

Surface Elev.: 571.52 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	SILTY CLAY, tan and orange mottled, stiff, dry	
8.0		563.5
	LIMESTONE, light to medium-gray	
	Water at 17'	
	CHERTY LIMESTONE	
	Bottom of well casing at 40' Mud seam at 42'	
	Soft spot at 64' Fracture at 66' Fracture at 68'	
	Soft spot from 76' to 78'	
	Fracture at 80'	
	Soft spot at 100'	
	Fracture zone from 119' to 120'	
125.0		446.5
	Boring Terminated at 125 Feet	

GRAPHIC LOG | DEPTH (ft) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 14' and 17'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 12-06-2001 | Well Completed: 12-08-2001

Drill Rig: | Driller: Miller Drilling

Project No.: E1187001 | Exhibit: B-12

WELL LOG NO. MW-10

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

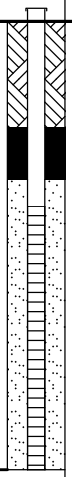
LOCATION See Exhibit A-2

Surface Elev.: 571.77 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.5	**TOPSOIL AND ROOTS**	571.3
	SILTY CLAY, orange to red-brown	
	Changes in color to light-brown/tan	
12.0		559.8
	LIMESTONE, light to medium-gray, slightly weathered	
17.0		554.8
	Boring Terminated at 17 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 4'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-20-2000
Well Completed: 01-20-2000
Drill Rig:
Driller: AL Environmental Drilling
Project No.: E1187001
Exhibit: B-13

WELL LOG NO. MW-11

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

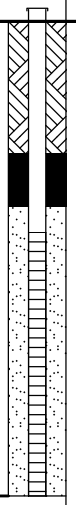
LOCATION See Exhibit A-2

Surface Elev.: 572.37 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.0	**FILL (SILTY CLAY AND GRAVEL)**, gray to tan	
6.0		566.4
	SILTY CLAY, light gray to tan	
13.0		559.4
	LIMESTONE, light to medium-gray, slightly weathered	
18.0		554.4
	Boring Terminated at 18 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 5'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-18-2000
Well Completed: 01-18-2000
Drill Rig:
Driller: AL Environmental Drilling
Project No.: E1187001
Exhibit: B-14

WELL LOG NO. MW-12

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

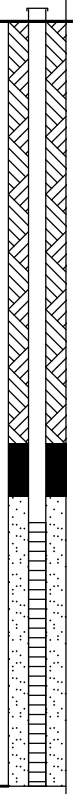
LOCATION See Exhibit A-2

Surface Elev.: 574.11 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	FILL, black fine to large-grained sand, with gravel and cobble-sized pieces of slag	
14.0		560.1
	SILTY CLAY, light-gray	
24.0		550.1
	LIMESTONE, light to medium-gray, slightly weathered	
29.0		545.1
	Boring Terminated at 29 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20, 25

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No water observed

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 02-01-2000
Well Completed: 02-01-2000
Drill Rig:
Driller: AL Environmental Drilling
Project No.: E1187001
Exhibit: B-15

WELL LOG NO. MW-13

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

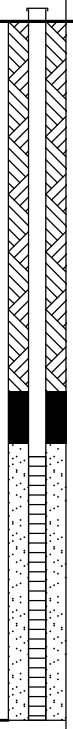
LOCATION See Exhibit A-2

Surface Elev.: 575.94 (Ft.)

GRAPHIC LOG	DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
		FILL, black fine to large-grained sand, with gravel and cobble-sized pieces of slag	
	19.0		556.9
		SILTY CLAY, light to medium-gray	
	21.5		554.4
		LIMESTONE, light to medium-gray, slightly weathered	
	26.5		549.4
		Boring Terminated at 26.5 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20, 25

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No water observed

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 02-02-2000
Well Completed: 02-02-2000
Drill Rig:
Driller: AL Environmental Drilling
Project No.: E1187001
Exhibit: B-16

WELL LOG NO. MW-14R

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

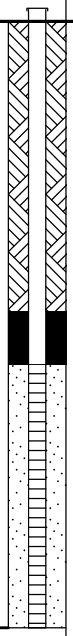
LOCATION See Exhibit A-2

Surface Elev.: 572.0 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	CLAY WITH GRAVEL AND SLAG	
10.0		562
	CLAY, dark brown, moist	
15.0		557
	CLAY, yellow, moist	
23.0		549
	Boring Terminated at 23 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Hollow Stem Auger

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 8'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 11-08-2012
Well Completed: 11-08-2012
Drill Rig:
Driller: Technical Drilling Services
Project No.: E1187001
Exhibit: B-17

WELL LOG NO. MW-15

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

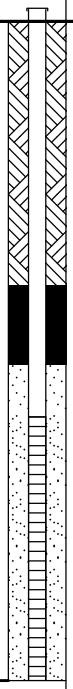
LOCATION See Exhibit A-2

Surface Elev.: 568.67 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	TOPSOIL, dark gray to black	
2.0		566.7
	SILTY CLAY, tan, dry	
10.0		558.7
	LIMESTONE	
	Fractured zone from 17' to 18'	
25.0		543.7
	Boring Terminated at 25 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20, 25

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No water observed

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 12-07-2001

Well Completed: 12-07-2001

Drill Rig:

Driller: Miller Drilling

Project No.: E1187001

Exhibit: B-18

WELL LOG NO. MW-16

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

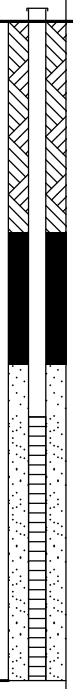
LOCATION See Exhibit A-2

Surface Elev.: 572.29 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
2.0	**TOPSOIL**, black	570.3
11.0	**SILTY CLAY**, orange, dry	561.3
25.0	**LIMESTONE**, light gray to white, weathered top 1' Fractured zone from 17' to 18'	547.3
	Boring Terminated at 25 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20, 25

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No water observed

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 12-07-2001
Well Completed: 12-07-2001
Drill Rig:
Driller: Miller Drilling
Project No.: E1187001
Exhibit: B-19

WELL LOG NO. MW-17

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

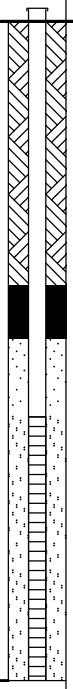
LOCATION See Exhibit A-2

Surface Elev.: 571.62 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	FOUNDRY SAND AND SLAG, black, mixed with dark brown silty clay	
	Water at 8'	
10.0		561.6
	SILTY CLAY, dark brown and gray	
	Tan	
23.5		548.1
25.0	**LIMESTONE**	546.6
	Boring Terminated at 25 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20, 25

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 5.5' and 8'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-23-2002
Well Completed: 01-23-2002
Drill Rig:
Driller: Miller Drilling
Project No.: E1187001
Exhibit: B-20

WELL LOG NO. TW-1

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

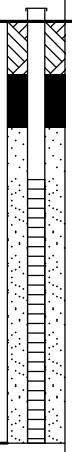
LOCATION See Exhibit A-2

Surface Elev.: 573.08 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	FILL	
6.0		567.1
	SILTY CLAY, light reddish brown, medium plasticity	
16.0	LIMESTONE bedrock - end of borehole	557.1
	Boring Terminated at 16 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15

GRAPHIC LOG | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 8'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 02-28-2002 | Well Completed: 02-28-2002

Drill Rig: | Driller: AL Environmental Drilling

Project No.: E1187001 | Exhibit: B-21

WELL LOG NO. TW-2

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

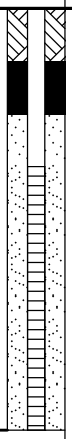
LOCATION See Exhibit A-2

Surface Elev.: 574.33 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	FILL	
6.0		568.3
	SILTY CLAY, light brown, medium plasticity	
9.0		565.3
	LIMESTONE BEDROCK	
16.0		558.3
	Boring Terminated at 16 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 14'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 02-28-2002
Well Completed: 02-28-2002
Drill Rig:
Driller: AL Environmental Drilling
Project No.: E1187001
Exhibit: B-22

WELL LOG NO. TW-3

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

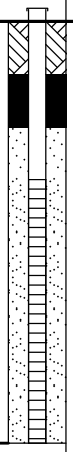
LOCATION See Exhibit A-2

Surface Elev.: 574.70 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	FILL	
5.0		569.7
	SILTY CLAY, light brown, medium plasticity	
13.0		561.7
	LIMESTONE BEDROCK	
16.0		558.7
	Boring Terminated at 16 Feet	

INSTALLATION DETAILS

Well Completion:



GRAPHIC LOG | DEPTH (ft) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 13.5'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 02-28-2002 | Well Completed: 02-28-2002

Drill Rig: | Driller: AL Environmental Drilling

Project No.: E1187001 | Exhibit: B-23

WELL LOG NO. TW-4

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

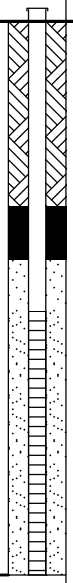
LOCATION See Exhibit A-2

Surface Elev.: 574.74 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	FILL	
5.0		569.7
	SILTY CLAY, light brown, medium plasticity	
7.0		567.7
	LIMESTONE BEDROCK	
21.0		553.7
	Boring Terminated at 21 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
HSA & Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 15.5'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 02-28-2002
Well Completed: 02-28-2002
Drill Rig:
Driller: AL Environmental Drilling
Project No.: E1187001
Exhibit: B-24

WELL LOG NO. RW-1

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

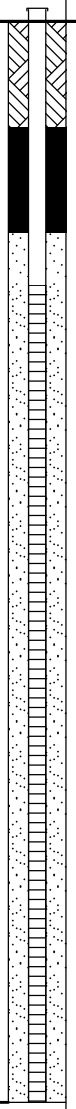
LOCATION See Exhibit A-2

Surface Elev.: 565.21 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	FOUNDRY SAND, FILL, dark gray to black	
5.0		560.2
	SILTY CLAY, light tan and gray mottled	
	Water encountered at 12'	
15.0		550.2
	LIMESTONE, light gray, weathered	
41.0		524.2
	Boring Terminated at 41 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20, 25, 30, 35, 40

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 12'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-13-1999
Well Completed: 01-13-1999
Drill Rig:
Driller: Miller Drilling
Project No.: E1187001
Exhibit: B-25

WELL LOG NO. RW-2

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

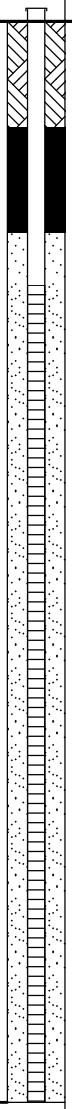
LOCATION See Exhibit A-2

Surface Elev.: 566.67 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	SILTY CLAY, tan to orange	
	Water encountered at 10'	
19.0		547.7
	LIMESTONE, light gray, weathered	
41.0		525.7
	Boring Terminated at 41 Feet	

INSTALLATION DETAILS

Well Completion:



DEPTH (ft): 5, 10, 15, 20, 25, 30, 35, 40

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 10'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-15-1999
Well Completed: 01-15-1999
Drill Rig:
Driller: Miller Drilling
Project No.: E1187001
Exhibit: B-26

WELL LOG NO. RW-3

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

LOCATION See Exhibit A-2

Surface Elev.: 567.82 (Ft.)

GRAPHIC LOG	DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)	INSTALLATION DETAILS
		FOUNDRY SAND, FILL, dark gray to black		Well Completion:
	15.0		552.8	
		SILTY CLAY, tan to brown		
	17.0		550.8	
		LIMESTONE, light gray, weathered		
	43.0		524.8	
		Boring Terminated at 43 Feet		

DEPTH (ft): 5, 10, 15, 20, 25, 30, 35, 40

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

No water observed

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 01-14-1999
Well Completed: 01-15-1999
Drill Rig:
Driller: Miller Drilling
Project No.: E1187001
Exhibit: B-27

WELL LOG NO. RW-4

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

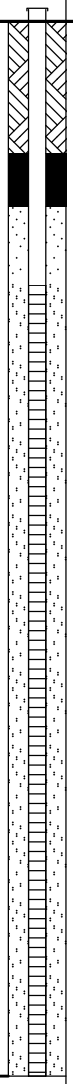
LOCATION See Exhibit A-2

Surface Elev.: 573.32 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
	FOUNDRY SAND, FILL, loose, brown to black, little gravel	
10.0		563.3
	CLAY, soft reddish-brown, wet at 10'	
20.0		553.3
	SILTY CLAY, firm, yellowish-brown, moist	
23.0		550.3
	LIMESTONE, dark gray, fine-grained, slightly weathered. Bedrock encountered at 23'. Hard limestone Weathered limestone to 33.5' Hard limestone	
40.0		533.3
	Boring Terminated at 40 Feet	

INSTALLATION DETAILS

Well Completion:



GRAPHIC LOG | DEPTH (ft) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 10' and 14'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 12-18-2000 | Well Completed: 12-19-2000

Drill Rig: | Driller: Miller Drilling

Project No.: E1187001 | Exhibit: B-28

WELL LOG NO. RW-5

PROJECT: Part B Permit Renewal Application

CLIENT: Mueller Property Holdings, LLC

SITE: SMWU 21 - Closed Landfill
Birmingham, Alabama

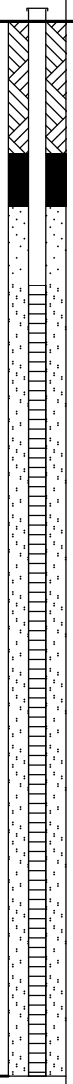
LOCATION See Exhibit A-2

Surface Elev.: 573.40 (Ft.)

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.0	**FOUNDRY SAND, FILL**, loose, brown to black, some gravel	
7.0		566.4
	CLAY, soft, reddish-brown, some silt, wet at 7'	
10.0		563.4
	SILTY CLAY, firm, yellowish-brown, slightly plastic, moist	
24.0		549.4
	LIMESTONE, dark gray, fine-grained, hard. Bedrock encountered at 24'.	
	Weathered limestone to 33', wet (some water encountered)	
40.0		533.4
	Boring Terminated at 40 Feet	

INSTALLATION DETAILS

Well Completion:



GRAPHIC LOG | DEPTH (ft) | WATER LEVEL OBSERVATIONS | SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Air-Rotary

Abandonment Method:

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Water observed at 7'. 8.51' and 32'

Terracon
2147 Riverchase Office Rd
Hoover, AL

Well Started: 12-18-2000 | Well Completed: 12-19-2000

Drill Rig: | Driller: Miller Drilling

Project No.: E1187001 | Exhibit: B-29

Gallet
& ASSOCIATES

Development of Risk-Based Facility Boundary Concentrations
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant
Birmingham, Alabama
EPA ID ALD 004 017 901
Gallet & Associates, Inc. Project No.: 04BHUSP0101E

Prepared for:
U.S. Pipe and Foundry Company
3000 30th Avenue North
Birmingham, Alabama 35207

July 16, 2004

GALLET & ASSOCIATES, INC.

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Senior Project Scientist

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Senior Geologist

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TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 SCOPE AND OBJECTIVES

The following document presents the processes and results of the calculation of risk based facility boundary concentrations at the US Pipe & Foundry, North Birmingham Plant located in Birmingham, Jefferson County, Alabama. The objective of this evaluation is to establish alternative corrective action levels (ACALs) for selected Volatile Organic Compounds (VOCs) [hereafter referred to as Chemicals of Potential Concern (COPCs)] identified in groundwater at the site.

This report describes the basic technical approach and principle assumptions used in completing the risk-based evaluation. The methodology utilized in this evaluation conforms to the general guidelines set forth in the *ARBCA: Alabama Risk-Based Corrective Action (ARBCA), Draft [Alabama Department of Environmental Management* (ADEM), January 15, 2002) as referenced in the Alabama Environmental Investigation and Remediation Guidance (AEIRG) document (revised October 2002).

The intent of this risk-based evaluation is to establish threshold concentrations for corrective action modification based primarily on ADEM's default exposure factors and fate and transport parameters with limited use of site-specific data. The on-site threshold concentrations are designed to be protective of residential receptors. The evaluation was completed in this manner due to the presence of the off-site residential properties to the south and east.

2.0 DEVELOPMENT OF SITE CONCEPTUAL MODEL

2.1 SITE DESCRIPTION AND LAND USE

2.1.1 Location and Vicinity

The U.S. Pipe and Foundry Company's North Birmingham Pipe Plant is located at 3000 30th Avenue North in the western 1/2 of the southwestern 1/4 of Section 13, Township 17 South, Range 3 West, in Birmingham, Jefferson County, Alabama. The site contains various plant operation areas, which include pipe production lines, office space, pipe storage yards, waste (non-hazardous and hazardous) storage areas, retention ponds, former waste storage areas, etc. This risk-based evaluation focuses on select VOCs detected in groundwater emanating from the closed landfill (SWMU #21) located along the southeastern portion of the site.

The area land use surrounding the subject site consists of commercial and residential development (light to heavy industry and residential housing).

2.1.2 Topography

The approximate elevation of the site is 560 feet above mean sea level (AMSL). The site gently slopes from north to south. Surface elevations decrease to the south-southeast towards Village Creek. The regional surface drainage from the site appears to be generally to the southeast.

2.1.3 Current Land Use

On-site

The site is currently an active ductile iron pipe manufacturer and contains various process, storage, and production areas.

Off-site

The off-site (donwgradient) properties to the south and east are currently zoned for residential use. The properties to the north and west are zoned for industrial and commercial use.

2.1.4 Future Land Use

On-site

Current land use for the subject site is industrial. According to the information obtained from the Jefferson County Planning and Zoning office, the site is zoned for heavy industrial use and likely to remain so for the foreseeable future. The site has been utilized for heavy industrial operations for over 100 years.

Off-site

The off-site (donwgradient) properties to the south and east are currently zoned for residential use. The properties to the north and west are zoned for industrial and commercial use. The zoning status for surrounding property is the same for the foreseeable future.

2.2 GEOLOGY, SOILS, AND HYDROGEOLOGY

2.2.1 Site Geology

U.S. Pipe and Foundry Company's North Birmingham Pipe Plant is located in the Birmingham-Big Canoe Valley Physiographic District of the Alabama Valley and Ridge Physiographic Province. The facility is underlain by the Cambrian-aged Conasauga Formation. The Conasauga Formation is composed of dark- to brownish-gray, sublithographic, medium- to thin-bedded limestone and light olive to medium gray shale. In the Birmingham-Big Canoe Valley, the Conasauga Formation is 1,100 to 1,900 feet thick. In the area of the facility, the depth to bedrock is approximately 15 feet below land surface (bls). Locally, the Conasauga Formation strikes to the north-northeast; the dip is to the south-southeast at approximately 20 degrees.

2.3.2 Site Soils

The surficial soils at the North Birmingham Pipe Plant consist primarily of various fill materials emplaced during development of this area. The original (native) soils are typically formed as the limestone bedrock weathers to a silty-clay residuum.

According to the United States Department of Agriculture Soil Conservation Service's Soil Survey of Jefferson County, Alabama (August 1982), soils on the subject property are classified as Urban Land. Urban Land consists of areas covered by commercial, industrial, and high-density residential facilities. This land has been altered to achieve large areas that are nearly level, to avoid flooding or wetness problems, or to increase the load supporting capacity. The original soil was altered by cutting, filling, shaping and grading, excavating, blasting, compacting, or covering with concrete or asphalt.

The soils noted in the borings advanced during various site investigations consisted of tan, brown, and yellow silty clays and sandy clays.

2.3.3 Site Hydrogeology

The major regional aquifer is the Knox-Shady Aquifer (Planert and Pritchett, 1989). In this area, the Knox-Shady Aquifer is a carbonate aquifer. Although the Knox-Shady Aquifer comprises rock units of the Knox Group, Ketona Dolomite, Conasauga Formation, Shady Dolomite, and Weisner Quartzite in the site area, immediately beneath the facility, the Conasauga Formation is present.

The monitoring wells installed during site assessment activities have been screened to investigate the intermediate groundwater flow zone. The measured potentiometric surface of the intermediate flow zone is approximately 14 to 16 feet bls (see ARCADIS risk assessment data in Permit Modification report dated April 14, 2004).

2.4 WATER USAGE

2.4.1 Current Water Usage

The groundwater table present at the site is currently not utilized as a potable water source. Potable water is supplied to the property and surrounding area by the City of Birmingham.

2.4.2 Future Water Usage

The property and surrounding area currently receive potable water from the City of Birmingham. Based on current use and future plans for water use in the Birmingham metropolitan area, use of the shallow groundwater for a potable or non-potable water supply is not likely.

3.0 CHEMICALS OF POTENTIAL CONCERN

3.1 SOURCE OF RELEASE

The apparent source of the COPCs in groundwater at the subject site is the closed landfill (SWMU #21). The COPCs detected in groundwater are chlorinated organics.

3.2 PRELIMINARY SCREENING EVALUATION (PSV)

3.2.1 PSV Summary and Description

The following sections discuss the detected COPCs in groundwater with comparisons to preliminary screening values (PSVs). Previous investigations have identified detectable analytes in groundwater.

The PSVs utilized in the following sections represent the most conservative values provided for the media and constituents, as presented in Appendix C of the ARBCA Guidance (ADEM, January 22, 2002). Generally, the PSVs represent values for Residential Child (most conservative input parameters) or Maximum Contaminant Level (MCL) for groundwater ingestion.

3.2.2 Chemicals of Potential Concern in Groundwater

The following VOCs that have exceeded their respective MCLs on the site have been selected as COPCs for groundwater at the site.

- Trichloroethene (TCE)
- cis-1,2-Dichloroethene (cis-1,2-DCE)
- trans-1,2-Dichloroethene (trans-1,2-DCE)
- Vinyl chloride

4.0 EXPOSURE ASSESSMENT

This section identifies the pathways by which humans are potentially exposed and estimates the magnitude of actual and/or potential human exposure. This process involves the following steps: (1) characterization of the exposure settings in terms of physical characteristics and the populations that may potentially be exposed to site-related chemicals, (2) identification of

potential exposure pathways, and (3) quantification of exposure for each population in terms of the amount of chemical ingested, inhaled, or absorbed through the skin from all exposure pathways. This assessment process is performed for both current and projected future site conditions.

4.1 EXPOSURE SETTING AND RECEPTORS

In this step the physical attributes and demographics of the site and surrounding area are identified. This information is gathered from the reports of previous investigations and aids in defining the physical mechanisms that control or influence how people could be exposed at each site and the processes that may control the fate and transport of contaminants. Demographics are characterized for the populations living or working at or near the site, the activity patterns of workers, and the locations of potentially sensitive subgroups. Key to this activity is determining current and foreseeable future land use of the sites and surrounding areas (e.g., residential, commercial, and industrial). Sources for this information included the following: site reconnaissance; previous investigations, maps, and aerial photographs, public records, zoning plans, and interviews with federal, state, and local officials.

4.1.1 On-site Exposure Setting

The subject site is located on a parcel used for heavy industrial activities. The area of impacted groundwater is within or adjacent to the closed landfill (SWMU #21). In addition, the site is zoned industrial and located in a heavily industrialized area of Birmingham. As a result, the conversion of the property to another use (i.e. residential) is highly improbable.

4.1.2 Off-site Exposure Setting

The surrounding land use is varied and consists of heavy industrial property and residential housing. Since the off-site, downgradient property is a housing development, Gallet & Associates, Inc. has assumed a residential off-site exposure setting.

4.2 EXPOSURE PATHWAYS AND TRANSPORT MEDIA

This Section identifies the exposure pathways for on-site receptors potentially coming into contact with COPCs at the site. A complete exposure pathway requires four elements: (1) a source or mechanism of chemical release, (2) a transport or retention medium, (3) a point of potential human contact with the contaminated source, and (4) a route of exposure at the point of contact.

As stated in Section 3.1 the apparent source of the release is the closed landfill (SWMU #21).

As part of the exposure assessment, Gallet & Associates, Inc. identified all of the primary contamination sources and receiving media (i.e., soil, groundwater, and air) at the site. Exposure routes (i.e., ingestion, inhalation, and dermal contact/absorption) were identified where people may potentially come in contact with contaminated media. The exposure routes considered

complete for this risk-based evaluation included indoor and outdoor inhalation of vapors from groundwater. Finally, since the site receives potable water from the City of Birmingham and will continue to receive public water for the foreseeable future, the pathway for ingestion of groundwater by on-site receptors was also not considered complete.

Based on these findings only exposure pathways with all four elements (i.e., a source or mechanism of release, a transport mechanism, an exposure point, and an exposure route) were considered complete. Therefore, the only routes of exposure considered complete for the site were for indoor and outdoor inhalation of vapor emissions from groundwater for residential children and adults (off-site) and commercial workers and construction workers (on-site). Based on the location of the COPCs in groundwater with respect to the off-site residential development, Gallet & Associates, Inc. has completed this risk-based evaluation with respect to the off-site residential receptors only.

4.3 QUANTIFICATION OF EXPOSURE

Once complete, exposure pathways are selected for evaluation. The final step of the exposure assessment is to quantify exposure (i.e., intake) for each pathway. This requires the use of equations, which contain several conservative, USEPA-established assumptions about the receptors and the exposure pathways as set forth in the ARBCA Guidance (ADEM, January 2002). These assumptions are also called variables or input parameters, and are used to help estimate the maximum exposure that may "reasonably" be expected to occur under current and future site conditions. Site-specific parameters input into the algorithms are used for the development of the Risk Management-2 (RM-2) values and are presented in Section 5.0.

5.0 DEVELOPMENT OF RM-2 TARGET LEVELS

5.1 TARGET RISK LEVEL

As part of the RBCA assessment there is a requirement to determine target or acceptable risk levels for both carcinogenic and non-carcinogenic health effects to humans (receptors). The carcinogenic effects are qualified using the individual excess lifetime cancer risk (IELCR), which represent the increased probability of an individual to develop cancer based on exposure to specific COPCs via actual or potential routes of exposure. The quantification of risk for non-carcinogenic effects is based on using a hazard quotient (HQ), which represents the ratio of the estimated dose for a chemical and a route of exposure to the referenced dose. The following sections detail the IELCR and the HQ used in the development of the RM-2 target values.

5.1.1 IECLR for Carcinogenic Chemicals

Based on the Draft ARBCA Guidance (ADEM, January 22, 2002) the acceptable cumulative carcinogenic risk for the State of Alabama is between the values of 1×10^{-4} to 1×10^{-6}. In order to retain the conservative nature of the ARBCA, the RM-2 evaluation will utilize 1×10^{-6} for the calculations for carcinogenic chemicals.

5.1.2 HQ for Non-carcinogenic Chemicals

The HQ utilized in the development of the RM-1 screening values is 0.1. Gallet & Associates, Inc. retained this HQ for the development of the RM-2 values.

5.2 TOXICITY EVALUATION

The toxicity values for the COPCs evaluated at the site are based on current accepted values of the United States Environmental Protection Agency (USEPA). The sources of the toxicity values are cited in the worksheet of the RBCA model utilized for the RM-2 development. The RM-2 algorithms and input parameters are provided in Appendix B.

5.3 PHYSICAL AND CHEMICAL PROPERTIES

The physical and chemical properties of the COPCs include the following parameters;

- Water Solubility
- Henry's Law Constant
- Organic Carbon Adhesion Coefficient
- Diffusion Coefficient in Air
- Diffusion Coefficient in Soil

The specific parameter values utilized for each COPC as part of the RM-2 evaluation were taken directly from Table 3-4 of the ARBCA Guidance (ADEM, January 22, 2002).

5.4 MODELS AND EQUATIONS

The models and algorithms utilized in the development of the RM-2 target levels are the same as those utilized by the ARBCA model for the calculation of the RM-1 screening values. Any modifications or additions of site-specific data to the model or algorithms are presented in Section 6.6. The input values and data are provided in Appendix A.

5.5 EXPOSURE FACTORS

The exposure factors utilized in this risk assessment represent very conservative estimates regarding receptor exposure to on-site COPCs. The factors include such values as time of exposure, body weight, inhalation rate, etc. Standards for these values have been developed by ADEM and the USEPA. Based on research conducted by Sager, et al. (1997), the aerial fraction of foundation cracks was modified from 0.01 cm to 0.005 cm. The exposure factors utilized in this RBCA (with the noted revisions) are presented in Appendix A.

5.6 FATE AND TRANSPORT PARAMETERS

The default fate and transport parameters used for the development of the RM-1 screening values are based on conservative estimates for the State of Alabama. Calculation or acquisition of site-specific parameters is one of the primary variations inherent in the development of RM-2 target values. The following sections detail the site-specific parameters utilized for fate and transport modeling of the COPCs. Fate and transport parameters used for the RM-2 evaluation are provided in Appendix A.

5.6.1 Vadose Zone Parameters

The characteristics of the vadose zone soils are integral in the determination of the vertical migration of COPCs to groundwater and upward movement of vapors to the surface. The thickness of the vadose zone is determined for this risk-based evaluation by the average of the depth to groundwater at the site, minus the thickness of the capillary fringe. The average historic depth to groundwater in the investigation area is approximately the 16 feet bls [487.60 centimeters (cm), ARCADIS Report dated April 14, 2004]. Based on the soil characterization conducted during site assessment, the site area is underlain by sandy to silty clay with a literature-based value of 100 cm for thickness of capillary fringe (Fetter, Applied Hydrogeology, 1994). Based on the depth to groundwater of 487.60 cm and a capillary fringe thickness of 100 cm the thickness of the vadose zone is 387.60 cm. Gallet & Associates, Inc. has only used the average depth to groundwater in the RM-2 evaluation. The capillary fringe thickness of five cm was retained as the RM-1 default value; therefore, the capillary fringe thickness for the RM-2 evaluation is 482.60.

5.6.1.1 Dry Bulk Density
Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.1.2 Porosity
Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.1.3 Volumetric Water Content/Moisture Content - Vadose Zone
Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.1.3.1 Volumetric Water Content of Capillary Fringe
Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.1.3.2 Volumetric Water Content in Foundation or Wall Cracks
Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.1.4 Fractional Organic Carbon In Soil
Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.1.5 Volumetric Air Content of Vadose Zone
Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.1.6 Volumetric Air Content of Capillary Fringe
Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.1.7 Volumetric Air Content in Foundation or Wall Cracks
Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.1.8 Width of Soil Source Area Parallel to Wind Flow and Groundwater Flow
Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.2 Saturated Zone Parameters

5.6.2.1 Depth to Groundwater
The depth to groundwater is determined by calculating the average historic depth to groundwater at the site. The average historic depth to groundwater across site is approximately 16 feet bls, or 487.60 cm (see ARCADIS risk assessment data in Permit Modification report dated April 14, 2004).

5.6.2.2 Groundwater Mixing Zone Thickness

Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.2.3 Hydraulic Conductivity in the Saturated Zone

Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.
5.6.2.4 Hydraulic Gradient in the Saturated Zone

Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.2.5 Groundwater Darcy Velocity

Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

5.6.2.6 Width of Groundwater Source Area Perpendicular to Groundwater Flow
Gallet & Associates, Inc. retained the ADEM-mandated RM-1 value for this parameter.

6.0 RM-2 SCREENING EVALUATION TARGET LEVELS

The following sections present the results of the site-specific RM-2 models and algorithms using site-specific input parameters.

Based on the results of the RM-2 evaluation, Gallet & Associates, Inc. calculated the following thresholds:

Analyte	RM-2 Threshold
• TCE	0.489 parts per million (ppm)
• cis-1,2-DCE	2.16 ppm
• trans-1,2-DCE	1.98 ppm
• Vinyl chloride	0.0547 ppm (res. Adult)

The threshold values presented above represent the most stringent target levels for the RM-2 evaluation (Resident Child indoor inhalation pathway). The Adult Resident RM-2 threshold for vinyl chloride was used since it was lower than the child RM-2 threshold. The output for the calculation of the RM-2 Target Levels are presented in Appendix A.

7.0 REFERENCES

ADEM, January 22, 2001, *ARBCA: Alabama Risk Based Corrective Action, Guidance Manual, Draft Document*, Alabama Department of Environmental Management, Montgomery, Alabama.

ADEM, October 2002, *Alabama Environmental Investigation and Remediation Guidance* (AEIRG); Alabama Department of Environmental Management, Montgomery, Alabama

ARCADIS Geraghty & Miller, January 21, 2000, *Development of Cleanup Criteria Risk Assessment for North Birmingham Plant.*

Gallet, October 13, 2000, *Phase I RCRA Facility Investigation Report SWMU 2 and AOC A,* Gallet & Associates, Inc., Birmingham, Alabama

Gallet, May 13, 2004, *2004 Annual Groundwater Monitoring Report*, Gallet & Associates, Birmingham, Alabama.

Gallet, April 14, 2004, *Application for AHWMMA Post Closure Permit Modification*, Gallet & Associates, Inc., Birmingham, Alabama

Geologic information published by the U. S. Geological Survey and the Alabama Geologic Survey.

Sager, S.L., L.D. Braddy, and C.H. Day, 1997. *The Infiltration Ration in Vapor Intrusion Calculations*. Presented at the Society for Risk Analysis Meeting, Washington, D.C.

USDA, August 1982, *Soil Survey of Jefferson County, Alabama* United States Department of Agriculture (USDA), (issued August 1982).

USEPA, October 1996, Drinking Water Regulations with Maximum Contaminant Levels (MCLs) and Health Advisories, United States Environmental Protection Agency.

USGS, 1978, *Birmingham North, Alabama*, United States Geological Survey, 7.5-minute Topographic Quadrangle dated 1959, photo revised 1978.

U.S. Pipe and Foundry Company
North Birmingham Pipe Plant
SITE SAFETY PLAN

A. GENERAL INFORMATION

SITE: Mueller Property Holdings, LLC, SWMU 21 - Landfill JOB NUMBER: E1187001

LOCATION: 3000 30th Avenue North, Birmingham, Alabama

PLAN PREPARED BY: Terrell W. Rippstein DATE: 1/18/2018

APPROVED BY: Terrell W Rippstein DATE: 1/18/2018

OBJECTIVES: To provide health and safety information required for operation and maintenance of the hydraulic control system

PROPOSED DATE OF INVESTIGATION: NA

BACKGROUND REVIEW: Complete: X
Preliminary:

DOCUMENTATION/SUMMARY: Overall Hazard: Serious:
Moderate:
Minor: X

B. SITE/WASTE CHARACTERISTICS

WASTE TYPE(S) Liquid X Solid X Sludge X
Gas

CHARACTERISTIC(S):

Corrosive	Ignitable	Radioactive	
Toxic	Reactive	Volatile	Chlorinated Solvents
Unknown		Other (name)	RCRA Metals

MISC. DESCRIPTION: low levels of chlorinated solvents. Specifically, TCE; cis-1,2-DCE; trans-1,2-DCE, VC; 1,1,1-TCE; and TCA.

FACILITY DESCRIPTION: Closed Part B Landfill

Principal Disposal Method (type and location): The groundwater is treated and then pumped into the spray pond.

Unusual Features (dike integrity, power lines, terrain, etc.):

Status (active, inactive, unknown): Closed Landfill

History (worker or non-work injury; complaints from public; previous agency action)
ADEM requesting Corrective Action Program

C. HAZARD EVALUATION

Potential low-level groundwater contmination with metals and chlorinated solvents.

D. SITE SAFETY WORK PLAN

Perimeter Establishment: Map/Sketch Attached: NA Site Secured x
Perimeter Identified X Zone(s) of Contamination Identified
Closed Landfill

PERSONAL PROTECTION:

Level Of Protection: D

Modification: Steel-toed boots and hard hats required, nitrile gloves required when handling materials or samples. Splash shields should be worn when repairing hydraulic control system and when cleaning the pumps.

Surveillance Equipment and Materials: None anticipated

DECONTAMINATION PROCEDURES:
Use dedicated pre-cleaned equipment. Any other equipment washed with a laboratory grade soap and triple rinsed with distilled water.

SITE ENTRY PROCEDURES: Modified level D with plant security.

Team Members

Terry Rippstein, Principal Geologist, Terracon
Eric Reardon, Project Geologist, Terracon
Brian Brown, Staff Scientist, Terracon
Meghan Di Giorgio, Staff Scientist, Terracon
Kyle Haggard, Field Scientist, Terracon

Work Limitations (time of day, etc.): None

Investigation-derived material disposal: NA

E. EMERGENCY INFORMATION

Local Resources

(To be determined prior to on-site activity)

Ambulance:	911
Hospital Emergency Room:	911
Poison Control Center:	911
Local Police:	911
State Police:	911
Fire Department:	911
Airport:	595-0533
Explosive Unit:	911
EPA Contact:	NA
State Environmental Agency:	(334) 271-7700
Health Department:	933-9110
Physician:	911
Others: Terracon	942-1289

APPENDIX E
SAMPLING AND ANALYSIS PLAN

Appendix E
Sampling and Analysis Plan
Mueller Property Holdings, LLC
Birmingham, Alabama
Facility ID No. ALD004017901

TABLE OF CONTENTS

Appendix E
Sampling and Analysis Plan
Mueller Property Holdings, LLC
Birmingham, Alabama
Facility ID No. ALD004017901

1.0 GENERAL INFORMATION

This Sampling and Analysis Plan for the North Birmingham Pipe Plant was prepared in general accordance with Alabama Environmental Investigation and Remediation Guidance (AEIRG, Revision 4, February 2017).

2.0 SAMPLE COLLECTION

Groundwater sample collection and analysis will be performed on a semi-annual basis for this facility. Collection of the groundwater samples will be performed in general accordance with the AEIRG. Analysis of the groundwater samples will follow the procedures and protocol recommended in the EPA document, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," 3rd Edition (EPA Office of Water and Waste Management, SW-846, 1986). Constituents to be analyzed will be dependent upon the type of monitoring being performed (i.e., Compliance Monitoring, Corrective Action Monitoring, etc.)

2.1 Measurement of Static Water Level Elevation

Prior to initiating purging and sampling, the depth to water and total well depth in each well will be determined to the nearest 0.01 foot using an electronic water level indicator. The distance from the top of the water to the survey mark, located on the top of the inner well casing will be measured and recorded. Nitrile disposable gloves will be worn while measuring the depth to water and total well depth. The probe and wetted portion of the tape of the water level indicator will be rinsed with phosphate-free laboratory grade detergent and tap water, rinsed with tap water, and final rinsed with deionized water immediately after use. At the time the well is gauged, it will also be visually inspected and the condition of the well will be noted. Once all of the monitoring wells have been measured, purging and sampling procedures will be initiated.

2.2 Well Evacuation

Purging is a process of removing stagnant water from a monitoring well prior to sampling. Purging is conducted to insure that stagnant water has been removed from the well and that groundwater samples that are representative of actual aquifer conditions will be collected. In order to determine when a well has been adequately purged, the field personnel will monitor the pH, specific conductance, and temperature of the groundwater removed during purging. In addition, a

minimum of 3 to 5 total well volumes should be removed. Prior to purging, the amount of water standing in the water column (water inside the well riser and screen) will be determined. A well volume of water will be calculated based on the information presented in Appendix C of the AEIRG.

An adequate purge is achieved when a minimum of 3 total well volumes of standing water has been removed, and when the pH, specific conductance, and temperature of groundwater have stabilized. Stabilization of the groundwater chemistry parameters occurs when pH measurements remain constant within 0.1 Standard Unit (SU), specific conductance varies no more than 10 percent, and the temperature is constant for at least three consecutive readings. Standard procedure is to collect an initial set of the groundwater chemistry parameters prior to all purging activities, with a set of parameters measured after each well volume has been removed. The conditions of all purging and sampling activities will be noted in the field log. If a well is pumped or bailed dry, this is considered an adequate purge and the well will be sampled following sufficient recovery (enough volume to allow filling of all sample containers), or within 24 hours.

The purge water will be placed into drums or totes. After completion of purging activities, the purge water will be transferred from the drums and/or totes into the onsite remediation system.

2.3 Field Analysis

At the time of sample collection, the well water will be tested for dissolved oxygen; oxidation-reduction potential; pH; temperature; and specific conductance. The probe of the pH/conductivity meter will not be inserted into any sample bottles that are to be sent to the laboratory for analysis.

Field instruments will be calibrated each day prior to use according to the manufacturers recommendations using appropriate standards (if applicable). Prior to use and between sample locations, the field instruments will be wiped with a clean, damp cloth. The probes on these instruments (pH, conductivity, DO, etc.) will be rinsed with analyte-free water and air-dried.

2.4 Sample Collection

Samples will be collected from the wells using dedicated disposable bottom valve polyethylene bailers. New plastic sheeting will be placed on the ground around each well to provide a clean working area. Clean nylon rope or monofilament line will be attached to the bailer. The bailer will be lowered slowly and gently into the top of the water column until just filled. The bailer will be removed carefully, and its contents emptied into the appropriate sample containers. The bailer will be raised and lowered slowly to prevent agitation and aeration of the water.

Groundwater samples will be collected in the order of the volatilization (highest ability to volatilize to the lowest) potential. Groundwater samples for VOC analysis will be collected initially prior to all other samples. The wells will be sampled from least contaminated to the most contaminated. The time of the sampling, the monitoring well location, the method of sampling, the color of

sample, any odors detected, and any sediment observed will be recorded in the field notes. The monitoring parameters are presented in the AHWMMA Post Closure Permit Number ALD 004 017 901.

In addition to the groundwater samples, a trip blank, a rinse blank, and a duplicate sample will be collected as quality assurance samples. A trip blank will be prepared by the lab and will be transported in the cooler with the samples. A field/equipment blank will be collected from a clean dedicated disposable bottom valve polyethylene bailer. One duplicate sample will be collected.

3.0 SAMPLE PRESERVATION

Samples will be placed in new laboratory-provided containers containing the required preservatives appropriate for the sample to be analyzed [three 40-ml VOA vials with hydrochloric acid (HCl) for VOCs, 250-ml plastic bottles with nitric acid (HNO_3) for metals, and 1-liter amber glass bottles with no chemical preservative for semi-volatiles.

4.0 LABELING AND CHAIN-OF-CUSTODY CONTROL

4.1 Sample Labels

Samples collected for specific field analysis or measurement data will be recorded directly in bound field logbooks, sample collection forms, and/or recorded directly on the Chain-of-Custody Record. Samples collected for laboratory analyses will include sample labels or sample tags. The following information will be written on the sample labels or tags using waterproof, non-erasable ink:

- Project number;
- Field identification or monitoring well number;
- Date and time of sample collection;
- Designation of the sample as a grab or composite;
- Type of sample (groundwater);
- The preservative used (if any); and
- The general types of analyses to be performed.

The labels may be partially filled out prior to sample collection. The date and time will be added to the label at the time the sample is collected.

4.2 Field Sample Log

At the time of collection, the following information will be recorded in the bound field notebook or on a Field Sample Log:

- Project number;
- Field identification or monitoring well number;
- Date and time of sample collection;
- Designation of the sample as a grab or composite;
- The signature of either the sampler(s) or the designated sampling team leader and the field sample custodian;
- Whether the sample was preserved or unpreserved, and if preserved, identify the preservative used;
- The types of analyses to be performed;
- Field measurements collected during the purging of monitoring wells (pH, Specific Conductivity, and Temperature);
- Water levels and total well depths measured during the sampling event; and,
- Any relevant comments (such as readily detectable or identifiable odor, color, turbidity, or known toxic properties).

4.3 Chain of Custody Record/Analysis Request

All information on the chain-of-custody forms should be recorded in a legible manner. Chain-of-custody forms will originate in the field immediately upon sampling groundwater. The chain-of-custody forms will stay with the samples at all times until properly relinquished to the laboratory for analysis. Information which should be present on chain-of-custody forms include the following:

- Site name and location.
- Date and time of sampling of each sample.
- Sample identification numbers.
- Name of sampler(s).
- Analytical laboratory to be utilized.
- Analytical methods to be used.
- Type of sample (*i.e.,* composite, grab, etc.).
- Matrix sampled (groundwater).
- Number of sample containers.
- Remarks regarding sampling, if applicable.
- Preservatives used for each sample (also indicate if placed on ice).
- Personnel relinquishing samples; times and dates.
- Personnel receiving samples; times and dates.

5.0 ANALYTICAL PROCEDURES

An EPA National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory will analyze the groundwater samples. The laboratory will employ methods specified in the following U. S. EPA Documents:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", 3rd Edition.

"Methods for Chemical Analysis of Water and Wastes", Revised March 1983.

6.0 LABORATORY QUALITY ASSURANCE\QUALITY CONTROL

6.1 Quality Control

The analytical laboratory will follow an active quality control program during the analysis of samples, including the aspects listed below:

Sample containers will be prepared in accordance with EPA protocols. Preservatives will be included in the proper bottles for client convenience and immediate stabilization of samples.

Internal quality controls will include routine analysis of quality control check samples, duplicates, and spiked samples. Techniques used for specific tests may include one or more of these approaches, as appropriate. Calibration samples and standard samples will be both prepared in-house and obtained from the U.S. Environmental Protection Agency (EPA). The results of quality control tests will be evaluated to determine the acceptability of analytical results and permanently recorded on tables and on control charts.

The laboratory will also participate in NELAP external quality control programs administered by the EPA. These programs are separate and additional to internal programs.

Detailed instructions for quality control procedures, sample handling, and EPA-approved test procedures are included in appropriate sections of laboratory manuals.

6.2 Quality Assurance

The important components of the laboratory's Quality Assurance Program will include adequately trained analysts, use of approved procedures, routine control of precision and accuracy, outside confirmation of internal control and records, and documentation of activities suitable for display to the public.

APPENDIX F
FINANCIAL ASSURANCE

POST-CLOSURE CARE PC-1

Facility Name: OSP, LLC

SUMMARY WORKSHEET

	Activity	Worksheet Number	Cost
1.	O&M of Hydraulic Control System	PC-A	$387,000.00
2.	Site Security	PC-3	N/A
3.	Maintenance of Vegetative Cover	PC_4	$150,000.00
4.	Maintenance and Inspection	PC-5	$54,000.00
5.	Groundwater Monitoring	PC-6	$513,000.00
6.	Deed Notation	PC-7	N/A
7.	Maintenance and Inspection of Asphalt Cover	PC-8	N/A
8.	Subtotal of Post-Closure Costs (Add lines 1 through 7)		$1,104,000.00
9.	Engineering Expenses (Engineering Expenses are typically 10% of post closure costs, excluding certification of post-closure.)		$110,400.00
10.	Certification of Post-Closure	PC-9	N/A
11.	Subtotal (Add engineering expenses and cost of certification of post-closure to post-closure costs [Add lines 8, 9, and 10])		$1,214,400.00
12.	Contingency Allowance (Contingency Allowances are typically 20% of post-closure care costs, engineering expenses, and cost of certification of post-closure.)		$242,880.00
TOTAL COST OF POST-CLOSURE CARE (add lines 11 and 12)			$1,457,280.00

POST-CLOSURE CARE

PC-A

Facility Name: OSP, LLC

CORRECTIVE ACTION

O&M on Hydraulic Control System				
1.	Inspections every two weeks	2 hr/trip	52 hrs/year @ $75.00/hr	$3,900.00
2.	Minor Maintenance	5 hrs/month	60 hrs/year @ $75.00/hr	$4,500.00
3.	Replacement of major components-labor	20 hrs/year	20 hour/year @ $75/hour	$1,500.00
4.	Replacement of major components-parts*	$3,000/year		$3,000.00
YEARLY TOTAL				$12,900.00
TOTAL COST OF HYDRAULIC CONTROL SYSTEM O&M (Total entered on PC-1, Line 1)				$387,000.00

POST-CLOSURE CARE PC-4

Facility Name: OSP, LLC

MAINTENANCE OF VEGETATIVE COVER

1. MOWING			
1.A	Area of Cover to be mowed (Enter from worksheet LF-1, line 1.D)	ft2	
1.B	Covert the area in ft2 to MSF (thousand square feet)(Divide line 1A by 1,000)	MSF	
1.C	Labor and equipment cost per MSF	$_/MSF	
1.D	Cost of 1 mowing event (Multiply 1.B by line 1.C)	$_/event	
1.E	Number of mowing events per year	events/year	
1.F	Number of years in post-closure care period*	years	
1.G	Number of mowing events during the post-closure care period (Multiply line 1.E by line 1.F)	events	
1.H	**Cost to mow for Post-Closure Care Period (Multiply line .D by line 1.G)**		$ See Item 3 below
2. FERTILIZING			
2.A	Area of Cover to be fertilized (Enter from line 1.B)	MSF	
2.B	Labor and equipment cost per MSF	$_/MSF	
2.C	Cost of 1 fertilizing event (Multiply 1.B by line 1.C)	$_/event	
2.D	Number of fertilizing events per year	events/year	
2.E	Number of years in post-closure care period*	years	
2.F	Number of fertilizing events during the post-closure care period (Multiply line 1.E by line 1.F)	events	
2.G	**Cost to fertilize for Post-Closure Care Period (Multiply line .D by line 1.G)**		$ See Item 3 below
3. Watering and Other Maintenance, Per Year = $5000			
3.A	Area of Cover to be fertilized (Enter from line 1.B)	MSF	
3.B	Labor and equipment cost per MSF	$_/MSF	
3.C	Cost of 1 watering event (Multiply 1.B by line 1.C)	$_/event	
3.D	Number of watering events per year	events/year	
3.E	Number of years in post-closure care period*	years	
3.F	Number of watering events during the post-closure care period (Multiply line 1.E by line 1.F)	events	
3.G	**Cost to water for Post-Closure Care Period (Multiply line .D by line 1.G)**		$ See Item 3 below
TOTAL COST OF MAINTENANCE OF VEGETATIVE COVER (Add Lines 1.H, 2.G, and 3.G)			$150,000.00

Notes: * Assume 30 years of post-closure care

POST-CLOSURE CARE PC-5

Facility Name: OSP, LLC

MAINTENANCE AND INSPECTION

If maintenance Costs are not specifically indicated, the cost of maintaining and repairing the final cover can be estimated based on a percentage of constructing the final cover (such as 20 percent). If the unit is closed and construction costs for the final cover are not available, use lanfill worksheets LF-3 through LF-6, found in chapter 7 to estimate cost.

1. MAINTENANCE AND RERAIR OF FINAL COVER			
1.A	Cost of installing clay layer	ft2	
1.B	Cost of installing geomembrane	MSF	
1.C	Costs of installing drainage layer	$_/MSF	
1.D	Cost of installing topsoil	$_/event	
1.E	Total cost of final cover	events/year	
1.F	**Cost to Maintain and Repair Final Cover**		$ N/A
2. POST-CLOSURE CARE INSPECTION			
2.A	Cost of Conducting one inspection	$150.00**/inspection	
2.B	Number of inspections per year	12 inspections per year	
2.C	Cost of Cconducting post-closure care inspections per year (Multiply line 2.A by line 2.B)	$1,800.00/year	
2.D	Number of years in post-closure care.*	30 years	
2.E	**Costs to Conduct Post-Closure Care Inspections Over the Post-Closure Care Period (Multiply line 2.C by line 2.D**		$54,000.00
TOTAL COST OF MAINTENANCE AND INSPECTION (Add lines 1.F and 2.E) (Enter total on Workshett PC-1, line 4)			$54,000.00

Notes: * Assume 30 years of post-closure care

** Based on 2 hours time per inspection @ $75.00/hour

POST-CLOSURE CARE PC-6

Facility Name: OSP, LLC

GROUNDWATER MONITORING

1. MAINTENANCE AND RERAIR OF FINAL COVER			
1	Number of years of groundwater monitoring during the post-closure period.	30 years	
2	Cost of groundwater monitoring per year	$17,100.00 /year	
TOTAL COST OF GROUNDWATER MONITORING (Multiply line 1 by line 2) (Enter on PC-1 worksheet, line 5)			$513,000

SAMPLING AND ANALYSIS SA-8

Facility Name: OSP, LLC

MAINTENANCE AND INSPECTION

Use this worksheet to estimate the cost of sampling and analysis of groundwater monitoring wells.

1. COLLECTION OF GROUNDWATER SAMPLE FOR CLOSURE			
1.A	Number of sample locations	17 sample locations	
1.B	Sampling team and equipment cost per work hour	$75	
	Choose the appropriate level of PPE: a. Protection Level D $75/work hr b. Protection Level C c. Protection Level B		
1.C	Work hours required to collect samples from one sampling location	2 work hrs/location	
1.D	Number of hours required to collect all samples (Multiply line 1.A by line 1.C)	34 work hours	
1.E	**Cost to Collect Groundwater Samples for Closure**		$2,550.00
2. ANALYSIS OF GROUNDWATER SAMPLE FOR CLOSURE			
2.A	Calculate the cost of analysis per sample event for groundwater samples.	N/A	
2.B	Enter the number of sampling events.	N/A	
2.C	**Costs to Analyze Groundwater Samples for Closure**		N/A
TOTAL COST OF SAMPLING AND ANALYSIS OF GROUNDWATER FOR CLOSURE			N/A
3. COLLECTION OF GROUNDWATER SAMPLE FOR CLOSURE			
3.A	Cost to sample groundwater wells for one sampling event (Enter from line 1.E	$2,550.00	
3.B	Enter the number of sampling events per year	2 event/year	
3.C	**Costs to Collect Groundwater Samples Annually for Post-Closure Care**		$5,100.00/year
4. ANALYSIS OF GROUNDWATER SAMPLE FOR POST-CLOSURE CARE			
4.A	Cost to analyze groundwater wells for one sampling event (Enter from line 1.E	$6,000.00	
4.B	Enter the number of analysis events per year	2 event/year	
4.C	**Costs to Analyze Groundwater Samples Annually for Post-Closure Care**		$12,000.00/year
TOTAL COST OF SAMPLING AND ANALYSIS OF GROUNDWATER ANNUALLY FOR POST-CLOSURE CARE			$17,100.00/year

Notes: Includes cost of collection and handling of samples, vehicle rental, and decontamination of sampling team and equipment.

APPENDIX G
FINANCIAL ASSURANCE MECHANISM

Bank of America

BANK OF AMERICA - CONFIDENTIAL PAGE: 1

DATE: FEBRUARY 25, 2013

IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER: 68069274

ISSUING BANK
BANK OF AMERICA, N.A.
ONE FLEET WAY
PA6-580-02-30
SCRANTON, PA 18507-1999

BENEFICIARY
ALABAMA DEPT OF ENVIRONMENTAL MGMT
1400 COLISEUM BLVD 36110-2400
MONTGOMERY, ALABAMA 36130-1463

APPLICANT
MUELLER PROPERTY HOLDINGS, LLC
1200 ABERNATHY RD
SUITE 1200
ATLANTA, GA 30328

AMOUNT
USD 1,475,100.00
ONE MILLION FOUR HUNDRED SEVENTY FIVE THOUSAND ONE HUNDRED AND 00/100'S US DOLLARS

EXPIRATION
FEBRUARY 25, 2014 AT OUR COUNTERS

WE HEREBY ESTABLISH OUR IRREVOCABLE STANDBY LETTER OF CREDIT NO. 68069274 IN YOUR FAVOR, AT THE REQUEST AND FOR THE ACCOUNT OF MUELLER PROPERTY HOLDINGS, LLC, 1200 ABERNATHY ROAD, NE, SUITE 1200, ATLANTA, GA 30328 UP TO THE AGGREGATE AMOUNT OF ONE MILLION FOUR HUNDRED SEVENTY FIVE THOUSAND ONE HUNDRED AND 00/100 UNITED STATES DOLLARS, (USD 1,475,100.00).

AVAILABLE UPON PRESENTATION OF:

1. YOUR SIGHT DRAFT, BEARING REFERENCE TO THIS LETTER OF CREDIT NO. 68069274, AND
2. YOUR SIGNED STATEMENT READING AS FOLLOWS: ''I CERTIFY THAT THE AMOUNT OF THE DRAFT IS PAYABLE PURSUANT TO REGULATIONS ISSUED UNDER AUTHORITY OF THE ALABAMA HAZARDOUS WASTES MANAGEMENT ACT OF 1978, AS AMENDED.''

THIS LETTER OF CREDIT IS EFFECTIVE AS OF FEBRUARY 25, 2013 AND SHALL EXPIRE ON FEBRUARY 25, 2014, BUT SUCH EXPIRATION DATE SHALL BE AUTOMATICALLY EXTENDED FOR A PERIOD OF ONE YEAR ON FEBRUARY 25, 2014 AND ON EACH SUCCESSIVE EXPIRATION DATE, UNLESS, AT LEAST 120 DAYS BEFORE THE CURRENT EXPIRATION DATE, WE NOTIFY BOTH YOU AND MUELLER PROPERTY HOLDINGS, LLC BY CERTIFIED MAIL THAT WE HAVE DECIDED NOT TO EXTEND THIS LETTER OF CREDIT BEYOND THE CURRENT EXPIRATION DATE. IN THE EVENT YOU ARE SO NOTIFIED, ANY UNUSED PORTION OF THE CREDIT SHALL BE AVAILABLE UPON PRESENTATION OF YOUR SIGHT DRAFT FOR 120 DAYS AFTER THE DATE OF RECEIPT BY BOTH YOU AND MUELLER PROPERTY HOLDINGS, LLC AS

ORIGINAL

THIS IS AN INTEGRAL PART OF LETTER OF CREDIT NUMBER: 68069274

SHOWN ON THE SIGNED RETURN RECEIPTS.

WHENEVER THIS LETTER OF CREDIT IS DRAWN UNDER AND IN COMPLIANCE WITH THE TERMS OF THIS CREDIT, WE SHALL DULY HONOR SUCH DRAFT UPON PRESENTATION TO US AT BANK OF AMERICA, N.A., ONE FLEET WAY, PA6-580-02-30, SCRANTON, PA 18507-1999, AND WE SHALL DEPOSIT THE AMOUNT OF THE DRAFT DIRECTLY INTO THE STANDBY TRUST FUND OF MUELLER PROPERTY HOLDINGS, LLC IN ACCORDANCE WITH YOUR INSTRUCTIONS.

WE CERTIFY THAT THE WORDING OF THIS LETTER OF CREDIT IS IDENTICAL TO THE WORDING SPECIFIED IN ADEM ADMINISTRATIVE CODE SUBPARAGRAPH 335-14-5-.08(12) (D) AS SUCH RULES WERE CONSTITUTED ON THE DATE SHOWN IMMEDIATELY ABOVE.

THIS LETTER OF CREDIT IS SUBJECT TO THE UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS (2007 REVISION) INTERNATIONAL CHAMBER OF COMMERCE PUBLICATION UPC 600.

IF YOU REQUIRE ANY ASSISTANCE OR HAVE ANY QUESTIONS REGARDING THIS TRANSACTION, PLEASE CALL 800-370-7519 OPT 1 .

AUTHORIZED SIGNATURE

THIS DOCUMENT CONSISTS OF 2 PAGE(S).

ORIGINAL

Bank of America

BANK OF AMERICA - CONFIDENTIAL PAGE: 1

STATEMENT OF FEES AND CHARGES

SCRANTON STANDBY
TRADE OPERATIONS PA6-580-02-30
1 FLEET WAY
SCRANTON PA 18507

LETTER OF CREDIT # 68069274
CUSTOMER NUMBER B0121405
STATEMENT DATE 02/25/13

BANKAMERICA BUSINESS CREDIT CHICAGO
DISBURSEMENTS
CT2-545-01-03 200 GLASTONBURY BLVD.
GLASTONBURY, CT 06033

US DOLLARS

YOUR REFERENCE:
APPLICANT: MUELLER PROPERTY HOLDINGS, LLC
BENEFICIARY: ALABAMA DEPT OF ENVIRONMENTAL MGMT

SUMMARY OF FEES

DATE INCURRED	FEE/CHARGE DESCRIPTION		FEE/AMOUNT AMOUNT
02/25/13	ISSUANCE FEE STBY PART	USD	250.00
02/25/13	COURIER FEE	USD	30.00
	TOTAL FEES DUE	USD	280.00
	TOTAL COMMISSIONS AND FEES DUE	USD	280.00

WE CHARGED YOUR ACCOUNT # **********3025 TODAY.

FOR QUESTIONS REGARDING THIS TRANSACTION, PLEASE CALL 800-370-7519 OR FAX 800-755-8743.

ORIGINAL

APPENDIX H
GROUNDWATER DATA

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
U.S. PIPE
North Birmingham Plant
Birmingham, Alabama

Sample ID	Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Bis (2-chloro-1-methylether	Bis (2-ethylhexyl)phthalate	Phenol	1,1-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dicnloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
GWPS		0.01	2.0	0.004	0.005	0.1	1.3	0.015	0.1	1.1	MDL	MDL	1.1	0.007	0.081	0.005	0.07	0.1	0.2	0.005	0.005	0.002
MW-1R	9/28/2009	<0.01	0.035	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.058	<0.00510	<0.0102	<0.00510	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-2R	9/28/2009	0.027	0.014	<0.001	<0.002	<0.005	<0.005	<0.006	0.036	0.216	<0.00510	**0.022**	<0.00510	**0.00799**	<0.001	<0.001	**1.77**	**0.075**	<0.001	<0.001	**0.502**	**0.0754**
MW-2BR	9/28/2009	<0.01	0.41	<0.001	<0.002	0.013	0.005	0.006	0.013	0.113	<0.00510	<0.0102	<0.00510	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-2C	9/28/2009	<0.01	0.052	<0.001	<0.002	0.047	0.039	**0.103**	0.027	0.523	<0.00510	<0.0102	<0.00510	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-3R	9/28/2009	<0.01	0.074	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.671	<0.00510	<0.0102	<0.00510	<0.001	0.00123	<0.001	0.00703	<0.001	<0.001	<0.001	<0.001	<0.001
MW-5R	9/28/2009	<0.01	0.129	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	<0.01	<0.00510	<0.0102	<0.00510	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-6	9/28/2009	<0.01	0.131	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.074	<0.00510	<0.0102	<0.00510	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-8	9/28/2009	<0.01	0.086	<0.001	<0.002	<0.005	<0.005	<0.006	0.011	0.500	<0.00510	<0.0102	<0.00510	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-12	9/28/2009	<0.01	0.07	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.057	<0.00510	<0.0102	<0.00510	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-13	9/28/2009	<0.01	0.088	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.127	<0.00510	<0.0102	<0.00510	<0.001	<0.001	<0.001	0.0077	<0.001	<0.001	<0.001	<0.001	0.00475

GWPS - Groundwater Protection Standard
All concentrations are reported in milligrams per liter (mg/L)
Bold type indicates concentration exceeds GWPS

U.S. Pipe North Birmingham
Birmingham, Alabama

		Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Phenol	Vinyl Chloride	1,1-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethane	cis-1,2-dichloroethene	1,1,1-Trichloroethane	1,2-Dichloroethane	Trichloroethene	1,1,2-Trichloroethane	Bis 2-chloro-1methyl Ether	Bis 2-ethylhexyl Phthlate	Acetone	Acrolein	Acrylonitrile	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chlorodibromomethane	Chloroethane	2-Chloroethyl vinyl ether	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	1,3-Dibromo-5-Chloropropane	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Dichlorodifluoromethane
MW-1R	d																																																			
	3/26/2010	<0.010	0.041	<0.001	<0.002	<0.005	<0.005	<0.006	0.006	0.019	<0.00505	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00505	<0.0101																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	< 0.0010	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-2R	d																																																					
	3/26/2010	**0.020**	0.017	<0.001	<0.002	<0.005	<0.005	<0.006	0.016	0.025	<0.0051	**0.0948**	<0.001	0.0444	<0.01	**1.3**	<0.01	<0.01	**0.28**	<0.01	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	**0.17**	**0.014**	0.059	<0.0010	**1.8**	<0.0010	<0.0010	**0.37**	<0.0010	<0.010	< 0.0010	0.018	<0.050	<0.010	0.00044	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-2BR	d																																																				
	3/26/2010	<0.010	0.330	<0.001	<0.002	<0.005	0.005	<0.006	<0.005	0.010	<0.0051	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	< 0.0010	<0.050	<0.050	<0.010	0.00044	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-2C	d																																																				
	3/26/2010	<0.010	0.048	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.045	<0.0051	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	< 0.0010	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-3R	d																																																			
	3/26/2010	<0.010	0.086	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	<0.010	<0.0051	<0.001	<0.001	<0.001	<0.001	0.00158	**0.0119**	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	0.0018	**0.011**	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	**0.0086**	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-5R	d																																																			
	3/26/2010	<0.010	0.198	<0.001	<0.002	<0.005	0.011	<0.006	<0.005	0.034	<0.0051	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-6	d																																																			
	3/26/2010	<0.010	0.090	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	<0.010	<0.0051	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-7	d																																																			
	3/26/2010	<0.010	0.100	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	<0.010	<0.0051	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-8	d																																																		
	3/26/2010	<0.010	0.120	<0.001	<0.002	<0.005	<0.005	<0.006	0.007	0.025	<0.0051	**0.00265**	<0.001	<0.001	<0.001	0.00265	<0.001	<0.001	<0.001	<0.001	<0.0051	>0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	0.0011	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	0.00096	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-8B	d																																																		
	3/26/2010	<0.010	0.297	<0.001	<0.002	<0.005	0.014	<0.006	<0.005	0.120	<0.0051	**0.00264**	<0.001	<0.001	<0.001	0.00169	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	**0.002**	<0.0010	<0.0010	<.0010	0.0017	<0.0016	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	0.0092	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-8C	d																																																		
	3/26/2010	<0.010	0.044	<0.001	<0.002	<0.005	0.005	<0.006	<0.005	0.017	<0.0051	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0051	**0.116**																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	**0.0023**	<0.0010	0.00031	<0.0010	**0.014**	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	0.0056	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-9	d																																																		
	3/26/2010	**0.016**	0.062	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.039	<0.0051	<0.001	<0.001	<0.001	<0.001	0.00449	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.116																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	0.001	<0.0010	0.00084	<0.0010	**0.011**	<0.0010	<0.0010	0.00083	<0.0010	<0.010	0.0011	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-9B	d																																																		
	3/26/2010	<0.010	0.367	<0.001	<0.002	<0.005	0.011	<0.006	<0.005	0.020	<0.0051	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0051	**0.565**																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	**0.02**	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-12	d																																																			
	3/26/2010	<0.010	0.066	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	<0.010	<0.0051	<0.001	<0.001	<0.001	<0.001	0.00123	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	0.00063	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-13	d																																																		
	3/26/2010	<0.010	0.131	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.011	<0.0051	<0.001	<0.001	<0.001	<0.001	0.00135	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	0.0017	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-14	d																																																		
	3/26/2010	<0.010	0.073	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.014	<0.0051	<0.001	<0.001	<0.001	<0.001	0.00145	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	0.0018	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	0.00035	<0.0010	<0.0050
MW-15	d																																																		
	3/26/2010	<0.010	0.062	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.015	<0.0051	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0107																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	0.0016	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-16	d																																																		
	3/26/2010	<0.010	0.027	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.012	<0.0051	<0.001	<0.001	<0.001	0.00216	**0.0241**	<0.001	<0.001	**0.00549**	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	0.0023	**0.032**	<0.0010	<0.0010	**0.0068**	<0.0010	<0.010	0.0011	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
MW-17	d																																																		
	3/26/2010	<0.010	0.058	<0.001	<0.002	<0.005	<0.005	<0.006	<0.005	0.108	<0.0051	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0051	<0.0102																																			
	5/20/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.050	<0.050	<0.010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.050	<0.0050	<0.0025	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
PSV		**0.01**	**2.00**				**1.30**		**0.10**	**1.00**		**0.002**	**0.007**	**0.10**	**0.081**	**0.007**				**0.005**			**0.006**																																		

All concentrations in mg/l
Bold = Exceedance

U.S. Pipe North Birmingham
Birmingham, Alabama

		1,2-Dichloropropane	1,1-Dichloropropene	1,3-Dichloropropane	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	2,2-Dichloropropane	Ethylbenzene	2-Hexanone	Hexachloro-1,3-butadiene	Isopropylbenzene	p-Isopropyltoluene	2-Butanone (MEK)	Methylene Chloride	4-Methyl-2-pentanone (MIBK	Naphthalene	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Toluene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	Trichlorofluoromethane	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Xylenes, Total	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachloroethane	Indeno(1,2,3-cd)pyrene	Isophorone	Nitrobenzene	n-Nitrosodiphenylamine	Phenanthrene	Di-n-butyl phthalate	Diethyl phthalate	Dimethyl phthalate	Di-n-octyl phthalate	Pyrene	Pentachlorophenol
MW-1R	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-2R	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.00061	<0.0010	<0.0010	<0.0050	<0.0010	0.00061	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	0.00069	<0.0010	<0.010	<0.0010	<0.010	<0.010	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-2BR	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-2C	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-3R	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.00084	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-5R	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	0.00040	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-6	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-7	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-8	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.00058	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-8B	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	>0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-8C	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-9	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-9B	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-12	d																																													
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-13	d																																												
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-14	d																																												
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-15	d																																												
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-16	d																																												
	3/25/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
MW-17	d																																												
	3/26/2010																																														
	5/20/2010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0050	<0.010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0030	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0010	<0.010	<0.010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.010
PSV																																										0.0460					

All concentrations in mg/l
Bold = Exceedance

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
U.S. PIPE
North Birmingham Plant
Birmingham, Alabama

Sample ID	Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Bis (2-chloro-1-methyl)ether	Bis (2-ethylhexyl)phthalate	Phenol	1,1-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Vinyl Chloride
GWPS		0.01	2.0	0.004	0.005	0.1	1.3	0.015	0.1	1.1	MDL	MDL	1.1	0.007	0.081	0.005	0.07	0.1	0.2	0.005	0.005	0.002
MW-1R	9/30/2010	<0.001	0.025	<0.002	<0.005	<0.010	<0.020	<0.005	<0.020	<0.030	<0.010	<0.001	<0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-2R	9/30/2010	**0.022**	0.0095	<0.002	<0.005	<0.010	<0.020	<0.005	<0.020	<0.030	<0.010	0.0036	<0.010	**0.01**	<0.001	<0.001	**2.7**	0.047	<0.001	<0.001	**0.73**	**0.13**
MW-2BR	9/30/2010	0.0099	0.47	<0.002	<0.005	0.055	<0.020	0.013	0.027	0.087	<0.010	<0.001	<0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-2C	9/30/2010	0.0015	0.064	<0.002	<0.005	0.021	<0.020	0.0052	<0.020	0.035	<0.010	<0.001	<0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-3R	9/30/2010	**0.019**	0.097	<0.002	<0.005	<0.010	<0.020	<0.005	<0.020	<0.030	<0.010	0.0015	<0.010	<0.001	0.001	<0.001	0.0062	<0.001	<0.001	<0.001	<0.001	<0.001
MW-5R	9/30/2010	**0.015**	0.11	<0.002	<0.005	<0.010	<0.020	<0.005	<0.020	<0.030	<0.010	<0.001	<0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-6	9/30/2010	0.0045	0.12	<0.002	<0.005	<0.010	<0.020	<0.005	<0.020	<0.030	<0.010	0.0026	<0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-8	9/30/2010	0.0087	0.13	<0.002	<0.005	<0.010	<0.020	<0.005	<0.020	<0.030	<0.010	<0.001	<0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-12	9/30/2010	**0.012**	0.07	<0.002	<0.005	<0.010	<0.020	<0.005	<0.020	0.054	<0.010	0.0034	<0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-13	9/30/2010	0.0035	0.088	<0.002	<0.005	<0.010	<0.020	<0.005	<0.020	<0.030	<0.010	0.0011	<0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

GWPS - Groundwater Protection Standard
All concentrations are reported in milligrams per liter (mg/L)
Bold type indicates concentration exceeds GWPS

Table 3
Groundwater Analytical Data - March 2010 / May 2010
U.S. Pipe North Birmingham
Birmingham, Alabama

Well Number	Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Phenol	Vinyl Chloride	1,1-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethane	cis-1,2-dichloroethene	1,1,1-Trichloroethane	1,2-Dichloroethane	Trichloroethene	1,1,2-Trichloroethane	Bis 2-chloro-1methyl Ether	Bis 2-ethylhexyl Phthlate	Acetone	Acrolein	Acrylonitrile	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chlorodibromomethane	Chloroethane	2-Chloroethyl vinyl ether	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	1,2-Dibromo-3-Chloroprop	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Dichlorodifluoromethane	1,2-Dichloropropane
MW-1R	d																																																			
	3/30/2011	<0.01	0.0244	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-2R	d																																																							
	3/30/2011	0.0212	0.0231	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	0.112	0.00671	0.0546	<0.001	<0.001	< 0.001	<0.001	0.332	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-2BR	d																																																						
	3/30/2011	<0.01	0.339	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-2C	d																																																						
	3/30/2011	<0.01	0.0506	<0.004	<0.001	0.0051	<0.01	0.0054	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-3R	d																																																					
	3/30/2011	<0.01	0.0898	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	0.00183	<0.001	<0.001	0.00904	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-5R	u																																																					
	3/30/2011	<0.01	0.136	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-6	d																																																						
	3/30/2011	<0.01	0.0605	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-7	d																																																					
	3/30/2011	<0.01	0.132	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-8	d																																																					
	3/30/2011	<0.01	0.116	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	0.0595	<0.001	0.00282	<0.001	0.0511	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-8B	d																																																					
	3/30/2011	<0.01	0.531	<0.004	<0.001	0.015	0.0143	0.0136	<0.01	<0.05	<0.00943	0.00109	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-8C	d																																																					
	3/30/2011	<0.01	0.259	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	0.00433	<0.001	<0.001	<0.001	0.0191	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-9	d																																																					
	3/30/2011	<0.01	0.0528	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	0.00274	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-9B	d																																																					
	3/30/2011	<0.01	0.266	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	0.0762	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-12	d																																																						
	3/30/2011	<0.01	0.0671	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-13	d																																																					
	3/30/2011	<0.01	0.0844	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-14	d																																																					
	3/30/2011	<0.01	0.0279	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-15	d																																																					
	3/30/2011	<0.01	0.0927	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-16	d																																																					
	3/30/2011	<0.01	0.0274	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	0.00192	0.0256	< 0.001	<0.001	0.00528	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW-17	d																																																					
	3/30/2011	<0.01	0.0658	<0.004	<0.001	<0.005	<0.01	<0.005	<0.01	<0.05	<0.00943	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.009	<0.00943	<0.05	<0.05	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
GWPS		0.01	2.00	0.00	0.01	0.10	1.30	0.02	0.10	1.10	1.1	0.002	0.007	0.10	0.081	0.07	0.2	0.005	0.005	0.005	NA	NA	0.55	4.2E-06	3.9E-05	0.005	MDL	MDL	NA	0.008	0.00087	0.024	0.024	0.024	0.1	0.005	0.1		0.0046	MDL	0.08	0.0016	0.012	MDL	0.0002	0.00005	0.61	0.6	0.018	0.075	0.039	0.005

All concentrations in mg/l
Bold = Exceedance
NA = No GWPS in Table III.3 of the facility permit

Table 3
Groundwater Analytical Data - March 2010 / May 2010
U.S. Pipe North Birmingham
Birmingham, Alabama

Well Number	Date	1,1-Dichloropropene	1,3-Dichloropropane	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	2,2-Dichloropropane	Ethylbenzene	2-Hexanone	Hexachloro-1,3-butadiene	Isopropylbenzene	2-Butanone (MEK)	Methylene Chloride	4-Methyl-2-pentanone (MIB	Naphthalene	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Toluene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	Trichlorofluoromethane	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Xylenes, Total	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachloroethane	Indeno(1,2,3-cd)pyrene	Isophorone	Nitrobenzene	n-Nitrosodiphenylamine	Phenanthrene	Di-n-butyl phthalate	Diethyl phthalate	Dimethyl phthalate	Di-n-octyl phthalate	Pyrene	Pentachlorophenol
MW-1R	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-2R	d																																													
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-2BR	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-2C	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-3R	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-5R	u																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-6	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-7	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-8	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-8B	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-8C	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-9	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-9B	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-12	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-13	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-14	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-15	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-16	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
MW-17	d																																												
	3/30/2011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.00943	<0.001	<0.05	<0.005	<0.01	<0.00189	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.00189	<0.00189	<0.00943	<0.00189	<0.00189	<0.00943	0.00189	<0.00943	<0.00943	<0.00943	<0.00189	<0.00943	<0.00943	<0.00943	<0.00943	<0.00189	<0.0236
GWPS		MDL	0.12	0.0084	0.0084	MDL	0.7	MDL	0.00886	0.66	0.7	0.005	0.2	0.00062	MDL	0.1	0.00043	5.5E-05	0.005	1	MDL	0.07	0.13	5.6E-06	0.0012	0.0012	10	0.0092	9.2E-06	0.0012	0.15	0.024	0.001	0.0048	9.2E-05	0.071	0.00034	0.014	0.0069	0.36	2.9	35	0.15	0.018	0.003

All concentrations in mg/l
Bold = Exceedance
NA = No GWPS in Table III.3 of the facility permit

sample container was labeled, wrapped in bubblepack, and placed immediately in a cooler containing ice. Sample coolers were shipped via overnight courier under proper chain-of-custody protocol to Test America in Nashville, Tennessee for analyses of the constituents listed in Appendix C. VOCs were analyzed by EPA method 8260B; metals were analyzed by EPA methods 6010B or 6020; and SVOCs were analyzed by EPA method 8270C.

The groundwater protection standards (GWPS) for the constituents presented in Table III.2 (Appendix C) are provided in Table III.3. of the Post-Closure Permit which is also included with this report in Appendix C. The September 2010 groundwater analytical results are presented in Table 4.0 below. A copy of the groundwater analytical laboratory report is included as Appendix D.

TABLE 4.0 – SUMMARY OF DETECTED CONSTITUENTS – SEPTEMBER 2011

MONITORING WELL	METALS			VOCS AND SVOCS						
	ARSENIC	BARIUM	ZINC	1,1-DCA	1,1-DCE	DEHP	CIS-1,2-DCE	TRANS-1,2-DCE	TCE	VINYL CHLORIDE
GWPS	**0.01**	**2.0**	**1.1**	**0.081**	**0.007**	**0.006***	**0.07**	**0.1**	**0.005**	**0.002**
MW-1R	BDL	0.034	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-2R	**0.01620**	0.012	BDL	BDL	0.00514	**0.013**	**0.894**	0.0249	**0.194**	**0.075**
MW-2BR	BDL	0.317	BDL	BDL	BDL	**0.0799**	0.00949	BDL	0.00342	BDL
MW-2C	BDL	0.0458	BDL	BDL	BDL	**0.0547**	BDL	BDL	BDL	BDL
MW-3R	0.00283	0.0793	BDL	0.00132	BDL	BDL	0.00423	BDL	BDL	BDL
MW-5R	0.00509	0.111	BDL	BDL	BDL	**0.00903**	BDL	BDL	BDL	BDL
MW-6	0.00450	0.171	BDL	BDL	BDL	0.00583	BDL	BDL	BDL	BDL
MW-8	**0.01270**	0.206	0.0608	BDL	BDL	BDL	0.00539	BDL	BDL	**0.00656**
MW-12	0.00510	0.0752	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-13	0.00525	0.190	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Concentrations in ppm/milligrams per liter (mg/l)
GWPS – Groundwater Protection Standard
* No GWPS established. Posted value represents Preliminary Screening Value (PSV) – ARBCA Guidance Manual, April 2008
BDL – below method detection limits
DCA - dichloroethane
DCE – dichloroethene
DEHP – bis(2-ethylhexyl)phthalate
TCE – trichloroethene
Bold – exceeds GWPS/PSV

Review of the laboratory analysis of the groundwater samples collected as part of the September 26, 2011 sampling event indicated the following:

- Detectable concentrations of one or more of the following VOCs and SVOCs in samples collected from MW-2R, MW-2BR, MW-2C, MW-3R, MW-5R, MW-6, and MW-8: 1,1-dichloroethane (DCA), 1,1-dichloroethene (DCE), bis(2-ethylhexyl)phthalate (DEHP),

containing ice. Sample coolers were shipped via overnight courier under proper chain-of-custody protocol to Test America in Nashville, Tennessee for analyses of the constituents listed in Appendix C. VOCs were analyzed using EPA method 8260B; metals were analyzed using EPA methods 6010B or 6020; and SVOCs were analyzed using EPA method 8270C.

The groundwater protection standards (GWPS) for the constituents are presented in Appendix C. The March 2012 groundwater analytical results are presented in Tables 4.0a and 4.0b below. A copy of the groundwater analytical laboratory report is included as Appendix D.

TABLE 4.0A – SUMMARY OF DETECTED CONSTITUENTS; BKG, EFF, & POC WELLS – MARCH 2012

CONSTITUENT	GWPS	MW-1R	MW-2BR	MW-2C	MW-2R	MW-3R	MW-5R	MW-6	MW-8	MW-12	MW-13
		POC	POC	POC	POC	POC	BKG	EFF	EFF	EFF	EFF
ARSENIC	**0.01**	--	--	--	**0.0150**	--	--	--	**0.0105**	--	--
BARIUM	**2.0**	0.0312	0.300	0.0432	0.0106	0.0730	0.119	0.0505	0.132	0.0725	0.119
CHROMIUM	**0.1**	--	--	--	--	--	--	--	--	--	0.005
1,1-DCA	**0.081**	--	--	--	--	0.00189	--	--	--	--	--
1,1-DCE	**0.007**	--	--	--	**0.00887**	--	--	--	--	--	--
DEHP	**0.006***	--	**0.0252**	--	--	--	--	--	--	--	--
CIS-1,2-DCE	**0.07**	--	--	--	--	0.00798	--	--	0.00368	--	--
TRANS-1,2-DCE	**0.1**	--	--	--	0.044	--	--	--	--	--	--
TOLUENE	**1.0**	--	0.0106	0.00644	0.00131	--	--	--	--	--	--
TCE	**0.005**	--	--	--	--	0.00154	--	--	--	--	--
VINYL CHLORIDE	**0.002**	--	--	--	**0.190**	--	--	--	**0.00633**	--	--

Concentrations in ppm/milligrams per liter (mg/l)
GWPS – Groundwater Protection Standard
* No GWPS established. Posted value represents Preliminary Screening Value (PSV) – ARBCA Guidance Manual, April 2008
POC – point of compliance monitoring well
BKG– background monitoring well
EFF – effectiveness monitoring well
-- – below method detection limits
DCA - dichloroethane
DCE – dichloroethene
DEHP – bis(2-ethylhexyl)phthalate
TCE – trichloroethene
Bold – exceeds GWPS/PSV

TABLE 4.0B – SUMMARY OF DETECTED CONSTITUENTS; BDY WELLS – MARCH 2012

CONSTITUENT	GWPS	MW-7	MW-8B	MW-8C	MW-9	MW-9B	MW-15	MW-16	MW-17
ARSENIC	**0.01**	--	--	--	**0.0265**	--	--	--	--
BARIUM	**2.0**	0.128	0.314	0.209	0.0555	0.188	0.0597	--	0.0631
COPPER	**1.3**	--	0.0104	--	--	--	--	--	--
CHLOROFORM	**0.08**	--	--	--	--	--	--	0.0487	--
DEHP	**0.006***	--	--	--	--	--	--	**0.0109**	--
CIS-1,2-DCE	**0.07**	--	--	0.00111	0.00567	--	--	--	--
TOLUENE	**1.0**	--	0.00634	0.00457	--	--	--	--	--
VINYL CHLORIDE	**0.002**	--	--	--	**0.00250**	--	--	--	--

Concentrations in ppm/milligrams per liter (mg/l)
GWPS – Groundwater Protection Standard
* No GWPS established. Posted value represents Preliminary Screening Value (PSV) – ARBCA Guidance Manual, April 2008
BDY – boundary monitoring well
-- – below method detection limits
DCA - dichloroethane
DCE – dichloroethene
DEHP – bis(2-ethylhexyl)phthalate
TCE – trichloroethene
Bold – exceeds GWPS/PSV

Review of the laboratory analysis of the groundwater samples collected as part of the March 2012 sampling event indicated the following:

- Detectable concentrations of one or more of the following VOCs and SVOCs in samples collected from the monitoring well network: chloroform, 1,1-dichloroethane (DCA), 1,1-dichloroethene (DCE), bis(2-ethylhexyl)phthalate (DEHP), cis-1,2-DCE, trans-1,2-DCE, toluene, trichloroethene (TCE), and vinyl chloride.

- Of the detected VOCs, concentrations of 1,1-DCE and vinyl chloride exceeded the GWPS in the sample collected from monitoring well MW-2R; and the concentration of vinyl chloride exceeded the GWPS in the samples collected from MW-8 and MW-9. All other VOCs were either not detected or detected at concentrations below the GWPS in all other monitoring wells.

- Detectable concentrations of semi-volatile DEHP were reported in the samples collected from MW-2BR and MW-16 at concentrations exceeding the Preliminary Screening Value (PSV). No GWPS was established for this constituent in the Post-Closure Permit. It is noted that DEHP has historically been detected in the upgradient well indicating that the presence of this constituent in groundwater is possibly due to the influence of an off-site source.

containers [40-ml vials with hydrochloric acid (HCl) for VOCs, 250-ml plastic bottles with nitric acid (HN03) for metals, and 100 ml amber glass bottles with no chemical preservative for semi-volatiles] by the laboratory, prior to use by HTSI personnel. Upon collection of each sample, the sample container was labeled, wrapped in bubblepack, and placed immediately in a cooler containing ice. Sample coolers were shipped via overnight courier under proper chain-of-custody protocol to ESC Lab Sciences in Mt. Juliet, Tennessee for analyses of the constituents listed in Appendix C. VOCs were analyzed by EPA method 8260B; metals were analyzed by EPA methods 6010B or 6020; and SVOCs were analyzed by EPA method 8270C.

The groundwater protection standards (GWPS) for the constituents presented in Table III.2 (Appendix C) are provided in Table III.3. of the Post-Closure Permit which is also included with this report in Appendix C. The September 2012 groundwater analytical results are presented in Table 4.0 below. A copy of the groundwater analytical laboratory report is included as Appendix D.

TABLE 4.0 – SUMMARY OF DETECTED CONSTITUENTS – SEPTEMBER 2012

MONITORING WELL	METALS			VOCS AND SVOCS					
	ARSENIC	BARIUM	ZINC	1,1-DCE	DEHP	CIS-1,2-DCE	TRANS-1,2-DCE	TCE	VINYL CHLORIDE
GWPS	**0.01**	**2.0**	**1.1**	**0.007**	**0.006***	**0.07**	**0.1**	**0.005**	**0.002**
MW-1R	BDL	0.019	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-2R	**0.022**	0.0094	BDL	0.0026	BDL	**0.53**	0.012	**0.30**	**0.035**
MW-2BR	0.0018	0.29	0.031	BDL	BDL	BDL	BDL	BDL	BDL
MW-2C	0.0013	0.045	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-3R	**0.015**	0.026	BDL	BDL	BDL	0.0030	BDL	BDL	BDL
MW-5R	**0.017**	0.10	0.034	BDL	0.0039	BDL	BDL	BDL	BDL
MW-6	0.0021	0.020	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-8	0.0082	0.12	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-12	0.0031	0.046	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MW-13	0.0018	0.035	BDL	BDL	0.0030	0.011	BDL	BDL	BDL

Concentrations in ppm/milligrams per liter (mg/l)
GWPS – Groundwater Protection Standard
* No GWPS established. Posted value represents Preliminary Screening Value (PSV) – ARBCA Guidance Manual, April 2008
BDL – below detection limit
DCE – dichloroethene
DEHP – bis(2-ethylhexyl)phthalate
TCE – trichloroethene
Bold – exceeds GWPS/PSV

Review of the laboratory analysis of the groundwater samples collected as part of the September 24-25, 2012 sampling event indicated the following:

TABLE 4.0A – SUMMARY OF DETECTED CONSTITUENTS; BKG, EFF, & POC WELLS – APRIL 2013

MONITORING WELL	METALS		
	ARSENIC	BARIUM	ZINC
GWPS	**0.01**	**2.0**	**1.1**
MW-1R	–	0.041	–
MW-2R	**0.021**	0.014	–
MW-2BR	0.0016	0.34	–
MW-2C	–	0.050	–
MW-3R	**0.028**	0.080	–
MW-5R	**0.018**	0.12	–
MW-6	0.0033	0.089	–
MW-8	**0.020**	0.16	–
MW-12	0.0051	0.055	0.051
MW-13	0.0029	0.13	0.056

VOCS AND SVOCS										
MONITORING WELL	1,1-DCA	DEHP	CIS-1,2-DCE	TRANS-1,2-DCE	1,2-DICHLOROPROPANE	FLUORENE	PHENANTHRENE	TCE	1,2,4-TRIMETHYLBENZENE	VINYL CHLORIDE
GWPS	**0.081**	**0.006***	**0.07**	**0.1**	**0.005**	**0.024**	**0.0469**	**0.005**	**0.0012**	**0.002**
MW-1R	--	**0.0066**	–	–	–	–	–	--	–	–
MW-2R	--	0.0052	**0.099**	0.0054	0.0014	0.0016	0.0024	**0.094**	0.0011	**0.014**
MW-2BR	--	**0.0068**	–	–	–	–	–	--	–	–
MW-2C	--	0.0046	–	–	–	–	–	--	–	–
MW-3R	0.0012	0.0041	0.0045	–	--	–	–	--	–	–
MW-5R	--	–	–	–	–	–	–	--	–	–
MW-6	--	–	–	–	–	–	–	--	–	–
MW-8	--	–	0.0024	–	–	–	–	--	--	**0.0032**
MW-12	--	0.0031	–	–	–	–	–	--	–	–
MW-13	--	–	0.011	–	–	–	–	--	–	**0.0036**

Concentrations in ppm/milligrams per liter (mg/l)
GWPS – Groundwater Protection Standard
* No GWPS established. Posted value represents Preliminary Screening Value (PSV) – ARBCA Guidance Manual, April 2008
– – Below detection limit (BDL)
DCA - dichloroethane
DCE – dichloroethene
DEHP – bis(2-ethylhexyl)phthalate
TCE – trichloroethene
Bold – exceeds GWPS/PSV

TABLE 4.0B – SUMMARY OF DETECTED CONSTITUENTS; BDY WELLS – APRIL 2013

MONITORING WELL	METALS				VOCS AND SVOCS			
	ARSENIC	BARIUM	CADMIUM	ZINC	CHLOROFORM	DEHP	CIS-1,2-DCE	VINYL CHLORIDE
GWPS	**0.01**	**2.0**	**0.005**	**1.1**	**0.08**	**0.006***	**0.07**	**0.002**
MW-7	0.0013	0.12	--	--	--	--	--	–
MW-8B	0.0022	0.20	--	--	--	--	--	–
MW-8C	0.0020	0.34	**0.016**	--	--	**0.016**	0.0050	0.0019
MW-9	**0.010**	0.054	--	0.046	--	--	0.0022	–
MW-9B	0.0011	0.16	--	--	--	0.0039	--	–
MW-14R	0.0046	0.14	--	0.073	--	--	0.0020	--
MW-15	--	0.055	--	0.073	--	**0.0069**	--	--
MW-16	0.0011	0.031	--	0.045	0.023	**0.015**	--	--
MW-17	0.0028	0.040	--	0.072	--	**0.0093**	--	--

Concentrations in ppm/milligrams per liter (mg/l)
GWPS – Groundwater Protection Standard
* No GWPS established. Posted value represents Preliminary Screening Value (PSV) – ARBCA Guidance Manual, April 2008
– – Below detection limit (BDL)
DCE – dichloroethene
DEHP – bis(2-ethylhexyl)phthalate
Bold – exceeds GWPS/PSV

Review of the laboratory analysis of the groundwater samples collected as part of the April 2013 sampling event indicated the following:

- Concentrations of one or more of the following VOCs and SVOCs were detected in the samples collected from the monitoring well network: chloroform, 1,1-dichloroethane (1,1-DCA), bis(2-ethylhexyl)phthalate (DEHP), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-DCE, 1,2-dichloropropane, fluorene, phenanthrene, trichloroethene (TCE), 1,2,4-trimethylbenzene, and vinyl chloride.

- Of the detected VOCs, concentrations of cis-1,2-DCE and TCE exceeded the GWPS in the sample collected from monitoring well MW-2R. Additionally, detected concentrations of vinyl chloride exceeded the GWPS in MW-2R, MW-8, and MW-13. All other VOCs were either not detected or detected at concentrations below the GWPS in all other monitoring wells.

- Detectable concentrations of semi-volatile DEHP were reported in the samples collected from MW-1R, MW-2BR, MW-8C, MW-15, MW-16, and MW-17 at concentrations exceeding the Preliminary Screening Value (PSV). No GWPS was established for this constituent in the Post-Closure Permit. It is noted that DEHP has historically been detected in the upgradient well indicating that the presence of this constituent in groundwater is possibly due to the influence of an off-site source.

Table 6. Summary of Groundwater Analytical Data - September 18, 2013
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant

Constituent	Units	GWPS	MW-1R	MW-2R	MW-2BR	MW-2C	MW-3R	MW-5R	MW-6	MW-8	MW-12	MW-13
Arsenic	mg/l	0.01	<0.020	**0.033**	<0.020	<0.020	**0.023**	**0.078**	<0.020	**0.020**	<0.020	**0.022**
Barium	mg/l	2	**0.065**	**0.0096**	**0.320**	**0.045**	**0.090**	**0.440**	**0.093**	**0.220**	**0.080**	**0.180**
Beryllium	mg/l	0.004	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	**0.0021**	<0.0020	<0.0020	<0.0020	<0.0020
Cadmium	mg/l	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**0.0057**	<0.0050	<0.0050	<0.0050	<0.0050
Chromium	mg/l	0.1	<0.010	<0.010	<0.010	<0.010	<0.010	**0.038**	<0.010	<0.010	<0.010	<0.010
Copper	mg/l	1.3	<0.020	<0.020	<0.020	<0.020	<0.020	**0.067**	<0.020	<0.020	<0.020	<0.020
Lead	mg/l	0.015	**0.0060**	<0.0050	<0.0050	<0.0050	<0.0050	**0.056**	<0.0050	<0.0050	<0.0050	**0.0089**
Nickel	mg/l	0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.0200
Zinc	mg/l	1.1	<0.030	<0.030	<0.030	<0.030	<0.030	**0.210**	<0.030	<0.030	<0.030	<0.0200
Bis(2-chloro-1-methyl)ether	mg/l	MDL	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bis(2-ethyhexyl)phthalate	mg/l	MDL	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	**0.0035**	<0.0030	<0.0030	<0.0030	<0.0030
Phenol	mg/l	1.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,1-Dichloroethane	mg/l	0.81	<0.0010	<0.010	<0.0010	<0.0010	**0.0011**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethene	mg/l	0.007	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloroethane	mg/l	0.005	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
cis-1,2-Dichloroethene	mg/l	0.07	<0.0010	**1.4**	<0.0010	<0.0010	**0.0021**	<0.0010	<0.0010	<0.0010	<0.0010	**0.0014**
trans-1,2-Dichloroethene	mg/l	0.1	<0.0010	**0.026**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1-Trichloroethane	mg/l	0.2	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/l	0.005	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichloroethene	mg/l	0.005	<0.0010	**0.780**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Vinyl chloride	mg/l	0.002	<0.0010	**0.089**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

GWPS = Groundwater Protection Standards
Bold/shaded concentrations exceed the GWPS
mg/l = milligrams per liter (parts per million)
Bis(2-chloro-1-methyl)ether

Table 6
March 20, 2014 Groundwater Data
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant

Parameter	Units	GWPS	MW-1R	MW-2R	MW-2BR	MW-2C	MW-3R	MW-5R	MW-6	MW-7	MW-8	MW-8B	MW-8C	MW-9	MW-9B	MW-12	MW-13	MW-14R	MW-15	MW-16	MW-17
Arsenic	mg/L	**0.01**	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Barium	mg/L	**2.0**	0.026	0.010	0.29	0.048	0.068	0.14	0.044	0.25	0.15	0.33	0.25	0.051	0.22	0.071	0.14	0.10	0.046	0.017	0.067
Beryllium	mg/L	**0.004**	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Cadmium	mg/L	**0.005**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Chromium	mg/L	**0.1**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Copper	mg/L	**1.3**	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Lead	mg/L	**0.015**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	mg/L	**0.1**	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Zinc	mg/L	**1.1**	<0.030	<0.030	0.033	<0.030	<0.030	0.034	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.037
Phenol	mg/L	**1.1**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chrysene	mg/L	**0.0092**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dibenzo(a,h)anthracene	mg/L	**0.0000092**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dibenzofuran	mg/L	**0.0012**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,2-Dichlorobenzene	mg/L	**0.6**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0016	<0.0010	<0.0010	<0.0010
1,3-Dichlorobenzene	mg/L	**0.018**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,4-Dichlorobenzene	mg/L	**0.075**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Diethyl phthalate	mg/L	**2.9**	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Dimethyl phthalate	mg/L	**360**	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Di-n-butyl phthalate	mg/L	**0.36**	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Di-n-octyl phthalate	mg/L	**0.15**	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Fluoranthene	mg/L	**1.5**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Fluorene	mg/L	**0.024**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Hexachlorobenzene	mg/L	**0.001**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Hexachlorobutadiene	mg/L	**0.00086**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Hexachloroethane	mg/L	**0.0048**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Indeno(1,2,3-cd)pyrene	mg/L	**0.000092**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Isophorone	mg/L	**0.071**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Naphthalene	mg/L	**0.00062**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nitrobenzene	mg/L	**0.00034**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Pentachlorophenol	mg/L	**0.001**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phenanthrene	mg/L	**0.0469**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Pyrene	mg/L	**0.018**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Acetone	mg/L	**0.55**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Acrolein	mg/L	**0.0000042**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Acrylonitrile	mg/L	**0.000039**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzene	mg/L	**0.005**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromobenzene	mg/L	**MDL**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromochloromethane	mg/L	**MDL**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromodichloromethane	mg/L	**0.08**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromoform	mg/L	**0.008**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromomethane	mg/L	**0.00087**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
n-Butylbenzene	mg/L	**0.024**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
sec-Butylbenzene	mg/L	**0.024**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
tert-Butylbenzene	mg/L	**0.024**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chlorobenzene	mg/L	**0.1**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010
Chloroethane	mg/L	**0.0046**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Chloroform	mg/L	**0.08**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.017	<0.0050
Chloromethane	mg/L	**0.0016**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
2-Chlorotoluene	mg/L	**0.12**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
4-Chlorotoluene	mg/L	**MDL**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
2-Chloroethyl vinyl ether	mg/L	**MDL**	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050

Table 6
March 20, 2014 Groundwater Data
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant

Parameter	Units	GWPS	MW-1R	MW-2R	MW-2BR	MW-2C	MW-3R	MW-5R	MW-6	MW-7	MW-8	MW-8B	MW-8C	MW-9	MW-9B	MW-12	MW-13	MW-14R	MW-15	MW-16	MW-17
Carbon disulfide	mg/L	**0.1**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Carbon tetrachloride	mg/L	**0.005**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethane	mg/L	**0.081**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethene	mg/L	**0.007**	<0.0010	0.0055	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloropropene	mg/L	**MDL**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dibromo-3-chloropropane	mg/L	**0.0002**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
1,2-Dibromoethane	mg/L	**0.00005**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloroethane	mg/L	**0.005**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloropropane	mg/L	**0.005**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,3-Dichloropropane	mg/L	**0.12**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
2,2-Dichloropropane	mg/L	**MDL**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dibromochloromethane	mg/L	**0.08**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dichlorodifluoromethane	mg/L	**0.039**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dibromomethane	mg/L	**0.61**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
cis-1,2-Dichloroethene	mg/L	**0.07**	<0.0010	0.075	<0.0010	<0.0010	0.0028	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	0.012	0.0028	<0.0010	<0.0010	0.016	0.0020	0.0014	0.063	<0.0050
cis-1,3-Dichloropropene	mg/L	**0.0004**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
trans-1,2-Dichloroethene	mg/L	**0.1**	<0.0010	0.0034	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
trans-1,3-Dichloropropene	mg/L	**0.0004**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ethylbenzene	mg/L	**0.7**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
2-Hexanone	mg/L	**MDL**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Isopropylbenzene	mg/L	**0.66**	<0.0010	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
p-Isopropyltoluene	mg/L	**MDL**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
4-Methyl-2-pentanone	mg/L	**0.2**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Methylene chloride	mg/L	**0.005**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Methyl ethyl ketone (2-Butanone)	mg/L	**0.7**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
n-Propylbenzene	mg/L	**MDL**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Styrene	mg/L	**0.1**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1,2-Tetrachloroethane	mg/L	**0.00043**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1-Trichloroethane	mg/L	**0.2**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	**0.000055**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/L	**0.005**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,3-Trichlorobenzene	mg/L	**MDL**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,3-Trichloropropane	mg/L	**0.0000056**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
1,2,4-Trichlorobenzene	mg/L	**0.07**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,4-Trimethylbenzene	mg/L	**0.0012**	<0.0010	0.0018	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,3,5-Trimethylbenzene	mg/L	**0.0012**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Tetrachloroethene	mg/L	**0.005**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	**1.0**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0060	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Trichloroethene	mg/L	**0.005**	<0.0010	0.023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichlorofluoromethane	mg/L	**0.13**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Vinyl chloride	mg/L	**0.002**	<0.0010	0.0089	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0021	<0.0010	<0.0010	<0.0010	0.0046	<0.0020	<0.0020	<0.0020	<0.0020
Xylenes, Total	mg/L	**10**	<0.0030	0.0033	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Gross Alpha	pCi/l	**15**	<1.5	<1.2	1.6	<1.2	<2.0	3.1	<1.8	3.2	2.2	4.8	<2.8	<2.7	3.5	3.9	4.8	3.2	3.0	1.7	<1.6
Gross Beta	pCi/l	**50**	5.6	14	3.2	4.2	3.3	2.7	7.5	6.6	4.5	16	7.2	3.2	11	4.0	7.2	4.7	6.9	4.4	<1.8

GWPS = Groundwater Protection Standards
Detected Constituents
Bold/shaded concentrations exceed the GWPS

MDL = Method Detection Limit
mg/L = milligrams per liter (parts per million)
PCi/l = picocuries per liter

Table 6. Summary of Groundwater Analytical Data - September 25, 2014
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant

Constituent	Units	GWPS	MW-1R	MW-2R	MW-2BR	MW-2C	MW-3R	MW-5R	MW-6	MW-8	MW-12	MW-13
Arsenic	mg/l	0.01	<0.020	**0.027**	<0.020	0.011*	0.011*	0.013*	0.0094*	0.017*	0.0090*	0.0085*
Barium	mg/l	2	**0.035**	**0.011**	**0.31**	**0.055**	**0.081**	**0.14**	**0.089**	**0.26**	**0.080**	**0.14**
Beryllium	mg/l	0.004	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	**0.0013**	<0.0020	<0.0020	<0.0020	<0.0020
Cadmium	mg/l	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Chromium	mg/l	0.1	0.0023*	0.0014*	0.0097*	0.0096*	0.0094*	0.0040*	0.0020*	0.0018*	0.0015*	0.0029*
Copper	mg/l	1.3	**0.026**	0.011*	0.0097*	0.0095*	0.026*	**0.14**	0.019*	0.014*	**0.024**	0.016*
Lead	mg/l	0.015	0.0022*	<0.0050	0.0046*	**0.0087**	<0.0050	**0.0062**	<0.0050	<0.0050	<0.0050	0.0034*
Nickel	mg/l	0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Zinc	mg/l	1.1	0.017*	0.0060*	**0.094**	0.040*	0.014*	**0.17**	0.018*	0.017*	0.018*	0.0099*
Bis(2-chloro-1-methyl)ether	mg/l	MDL	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bis(2-ethyhexyl)phthalate	mg/l	MDL	<0.0030	0.00092*	<0.0030	0.0015*	0.00074*	0.0011*	0.0012*	0.0012*	0.0013*	0.0013*
Phenol	mg/l	1.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,1-Dichloroethane	mg/l	0.81	<0.0010	<0.010	<0.0010	<0.0010	0.00064*	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethene	mg/l	0.007	<0.0010	**0.014**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloroethane	mg/l	0.005	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
cis-1,2-Dichloroethene	mg/l	0.07	**0.0021**	**2.2**	<0.0010	<0.0010	**0.0030**	<0.0010	**0.0014**	0.00046*	0.00040*	**0.0010**
trans-1,2-Dichloroethene	mg/l	0.1	<0.0010	**0.034**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1-Trichloroethane	mg/l	0.2	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/l	0.005	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichloroethene	mg/l	0.005	**0.0018**	**1.5**	<0.0010	<0.0010	**0.0015**	<0.0010	0.00053*	<0.0010	<0.0010	<0.0010
Vinyl chloride	mg/l	0.002	<0.0010	**0.15**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

GWPS = Groundwater Protection Standards
Bold/shaded concentrations exceed the GWPS
Bold constituents exceed the Reporting limits
*J-flagged = Estimated concentrations
mg/l = milligrams per liter (parts per million)
Bis(2-chloro-1-methyl) ether = Bis(2-chloroisopropyl) ether

Table 6
March 19, 2015 Groundwater Data
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant

	Units	GWPS	MW-1R	MW-2R	MW-2BR	MW-2C	MW-3R	MW-5R	MW-6	MW-7	MW-8	MW-8B	MW-8C	MW-9	MW-9B	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17
Arsenic	mg/L	**0.01**	**0.0392**	**0.0212**	<0.0065	<0.0065	<0.0065	0.0128 J	<0.0065	0.0071 J	<0.0065	<0.0065	<0.0065	0.0124 J	<0.0065	<0.0065	0.00889 J	0.00779 J	<0.0065	<0.0065	<0.0065
Barium	mg/L	**2**	**0.986**	**0.0131**	**0.306**	**0.0446**	**0.0616**	**0.155**	**0.0435**	**0.208**	**0.143**	**0.261**	**0.215**	**0.0453**	**0.194**	**0.0773**	**0.172**	**0.193**	**0.0423**	**0.015**	**0.0489**
Beryllium	mg/L	**0.004**	**0.0111**	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	0.000842 J	<0.0007	<0.0007	<0.0007
Cadmium	mg/L	**0.005**	<0.0007	&[Picture]	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	0.000894 J	<0.0007	<0.0007	<0.0007
Chromium	mg/L	**0.1**	**0.195**	<0.0014	0.00639 J	0.00322 J	0.00186 J	0.00338 J	<0.0014	0.00183 J	<0.0014	<0.0014	<0.0014	<0.0014	<0.0014	<0.0014	<0.0014	0.00538 J	<0.0014	<0.0014	<0.0014
Copper	mg/L	**1.3**	0.0185 J	<0.0053	<0.0053	<0.0053	<0.0053	0.0098 J	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	0.00853 J	<0.0053	<0.0053	<0.0053
Lead	mg/L	**0.015**	**0.125**	<0.0019	0.0023 J	0.00245 J	0.00203 J	**0.00989**	<0.0019	0.00202 J	<0.0019	0.00313 J	<0.0019	<0.0019	0.00197 J	0.00303 J	<0.0019	**0.00997**	0.00324 J	<0.0019	<0.0019
Nickel	mg/L	**0.1**	**0.101**	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	0.00512 J	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	0.0181 J	<0.0049	<0.0049	<0.0049
Zinc	mg/L	**1.1**	**0.93**	<0.0059	0.02 J	0.00831 J	<0.0059	0.0444 J	<0.0059	0.0375 J	<0.0059	0.00786 J	0.0133 J	0.033 J	<0.0059	<0.0059	<0.0059	**0.0575**	<0.0059	<0.0059	0.034 J
Acetone	mg/L	**0.055**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acrolein	mg/L	**4.2E-06**	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089	<0.0089
Acrylonitrile	mg/L	**0.000039**	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019
Benzene	mg/L	**0.005**	<0.00033	0.00063 J	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033
Bromobenzene	mg/L	**MDL**	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035
Mromochloromethane	mg/L	**MDL**	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052
Bromoform	mg/L	**0.008**	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047	<0.00047
Bromomethane	mg/L	**0.00087**	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087	<0.00087
N-butylbenzene	mg/L	**0.024**	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036
Sec-butylbenzene	mg/L	**0.024**	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036
Tert-butylbenzene	mg/L	**0.024**	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Carbon disulfide	mg/L	**0.1**	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028 J6	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028
Carbon tetrachloride	mg/L	**0.005**	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038
Chlorobenzene	mg/L	**0.1**	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	0.000689 J	<0.00035	<0.00035	<0.00035
Cloroethane	mg/L	**0.0046**	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045	<0.00045 J4	<0.00045 J4	<0.00045 J4	<0.00045 J4	<0.00045 J4	<0.00045 J4	<0.00045 J4
2-Chloro vinyl ether	mg/L	**MDL**	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003 J6J3	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chlorofrom	mg/L	**0.08**	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	**0.0127**	<0.00032
Cholomethane	mg/L	**0.0016**	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028
2-Chlorotoluene	mg/L	**0.012**	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038
4-Chlorotoluene	mg/L	**MDL**	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035
1,2-Dibromo-3-chloropropane	mg/L	**0.0002**	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013
1,2-Dibromomethane	mg/L	**0.0005**	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038
Dibromomethane	mg/L	**0.61**	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035
1,2-Dichlorobenzene	mg/L	**0.6**	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	**0.00117**	<0.00035	<0.00035	<0.00035
1,3-Dichlorobenzene	mg/L	**0.018**	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022
1,4-Dichlorobenzene	mg/L	**0.075**	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	0.000368 J	<0.00027	<0.00027	<0.00027
Dicholodofluoromethane	mg/L	**0.039**	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055
1,1-Dichloroethane	mg/L	**0.081**	<0.00026	<0.00026	<0.00026	<0.00026	0.000857 J	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	0.000314 J	<0.00026	<0.00026
1,2-Dichloroethane	mg/L	**0.005**	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036
1,1-Dichloroethene	mg/L	**0.007**	<0.0004	**0.00103**	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Cis-1,2-Dichloroethene	mg/L	**0.07**	<0.00026	**0.163**	<0.00026	<0.00026	**0.00283**	<0.00026	0.000527 J	<0.00026	0.000591 J	**0.001**	**0.00122**	**0.00211**	<0.00026	0.000675 J	**0.00182**	**0.00173**	**0.00132**	<0.00026	<0.00026
Trans-1,2-Dichloroethene	mg/L	**0.1**	<0.0004	**0.00384**	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,2-Dichloropropane	mg/L	**0.005**	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031
1,1-Dichloropropene	mg/L	**MDL**	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035
1,3-Dichloropropane	mg/L	**0.12**	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037
Cis-1,3-Dichloropropene	mg/L	**0.0004**	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042
Trans-1,3-DDichloropropene	mg/L	**0.0004**	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042	<0.00042
2,2-Dichloropropane	mg/L	**MDL**	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032
Ethylbenzene	mg/L	**0.7**	<0.00038	0.000672 J	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038
2-Hexanone	mg/L	**MDL**	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038
Isopropylbenzene	mg/L	**0.66**	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033
P-Isopropyltoluene	mg/L	**MDL**	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035
2-Buntanone (MEK)	mg/L	**0.7**	<0.0039 J3	<0.0039 J3	<0.0039 J3	<0.0039 J3	<0.0039 J3	<0.0039 J3	<0.0039 J3	<0.0039 J3	<0.0039 J3	<0.0039 J3	<0.0039 J3	<0.0039 J3	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039
Methylene Chloride	mg/L	**0.005**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
4-Methyl-2-Pentanone (MIBK)	mg/L	**0.2**	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021
N-Propylbenzene	mg/L	**MDL**	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035	<0.00035
Styrene	mg/L	**0.1**	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031
1,1,1,2-Tetrachloroethane	mg/L	**0.00043**	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038
1,1,2,2-Tetrachloroethane	mg/L	**0.000055**	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013
Tetrachloroethene	mg/L	**0.005**	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	**0.00107**	<0.00037	<0.00037	<0.00037
Toluene	mg/L	**1**	<0.00078	0.00423 J	0.00218 J	<0.00078	<0.00078	<0.00078	<0.00078	<0.00078	<0.00078	0.00144 J	<0.00078	<0.00078	<0.00078	<0.00078	<0.00078	<0.00078	<0.00078	<0.00078	<0.00078
1,2,3-Trichlorobenzene	mg/L	**MDL**	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023	<0.00023
1,1,1-Trichloroethane	mg/L	**0.2**	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319
1,1,2-Trichloroethane	mg/L	**0.005**	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038	<0.00038
Trichloroethene	mg/L	**0.005**	<0.0004	**0.0905**	<0.0004	<0.0004	0.000459 J	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.00073 J	<0.0004	<0.0004	<0.0004
Trichlorofluoromethane	mg/L	**0.13**	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012

Table 6
March 19, 2015 Groundwater Data
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant

	Units	GWPS	MW-1R	MW-2R	MW-2BR	MW-2C	MW-3R	MW-5R	MW-6	MW-7	MW-8	MW-8B	MW-8C	MW-9	MW-9B	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17
1,2,3-Trichloropropane	mg/L	**5.6E-06**	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081	<0.00081
1,2,4-Trimethylbenzene	mg/L	**0.0012**	<0.00037	**0.00236**	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037
1,3,5-Trimethylbenzene	mg/L	**0.0012**	<0.00039	**0.00109**	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039	<0.00039
Vinyl Chloride	mg/L	**0.002**	<0.00026	**0.0176**	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	0.000782 J	0.000431 J	0.000428 J	<0.00026	<0.00026	<0.00026	0.000628 J	<0.00026	<0.00026	<0.00026	<0.00026
Xylenes, Ttotal	mg/L	**10**	<0.0011	**0.00359**	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011
Chrysene	mg/L	**0.0092**	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033
Dibenz(a,h)anthracene	mg/L	**9.2E-06**	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028
Dibenzofuran	mg/L	**0.0012**	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034
Fluoranthene	mg/L	**0.15**	<0.00031	0.000644 J	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031
Fluorene	mg/L	**0.024**	<0.00032	0.000526 J	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032	<0.00032
Hexachlorobenzene	mg/L	**0.001**	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034	<0.00034
Hexachloro-1,3-Butadiene	mg/L	**0.00086**	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033
Hexachloroethane	mg/L	**0.0048**	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036
Indeno(1,2,3-cd)pyrene	mg/L	**0.000092**	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028
Isophorone	mg/L	**0.071**	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027	<0.00027
Naphthalene	mg/L	**0.00062**	<0.00037	0.00371 J	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037
Nitrobenzene	mg/L	**0.00034**	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037
N-Nitrosodiphenylamine	mg/L	**0.014**	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Phenanthrene	mg/L	**0.0469**	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037
Di-n-butyl phthalate	mg/L	**0.36**	0.00111 J	<0.00027	<0.00027	0.00135 J	0.000848 J	0.000288 J	0.000281 J	<0.00027	<0.00027	<0.00027	0.000419 J	<0.00027	0.000937 J	<0.00027	0.00029 J	<0.00027	0.000554 J	0.00136 J	<0.00027
Diethyl phthalate	mg/L	**2.9**	<0.00028	<0.00028	0.000612 J	0.000616 J	0.000548 J	<0.00028	<0.00028	0.000549 J	0.000412 J	0.00071 J	0.000684 J	0.000676 J	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028
Dimethyl phthalate	mg/L	**36**	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028
Di-n-octyl phthalate	mg/L	**0.15**	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028	<0.00028
Pyrene	mg/L	**0.018**	<0.00033	0.000395 J	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033
1,2,4-Trichlorobenzene	mg/L	**0.07**	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036	<0.00036
Pentachlorophenol	mg/L	**0.001**	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	0.000785 J	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031
Phenol	mg/L	**1.1**	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033	<0.00033
Gross alpha	pCi/l	**15**	**3.8**	<1.45	<2.33	<1.98	<3.75	<5.15	<2.24	**10.1**	**3.7**	<3.53	<2.66	<1.97	<3.59	<1.27	**5.7**	**10**	<3.00	<2.93	<3.00
Gross Beta	pCi/l	**50**	**13.1**	**19.5**	**3.2**	**1.07**	**2.8**	**7.97**	**9.24**	**7.66**	**4.39**	**18.2**	**20.5**	**6.17**	**4.24**	<1.62	**6.67**	**20.7**	**3.5**	**3.47**	**2.21**

GWPS = Groundwater Protection Standards **RDL = Reporting Detection Limit**
Detected Constituents above RDL are in bold **mg/L = milligrams per liter (parts per million)**
Bold/shaded concentrations exceed the GWPS **PCi/l = picocuries per liter**

Table 6. Summary of Groundwater Analytical Data - September 23, 2015
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant

Constituent	Units	GWPS	MW-1R	MW-2R	MW-2BR	MW-2C	MW-3R	MW-5R	MW-6	MW-8	MW-12	MW-13
Arsenic	mg/l	0.01	0.00685*	**0.026**	0.00860*	<0.0100	**0.0138**	**0.0205**	0.00861*	**0.0373**	**0.0115**	**0.0110**
Barium	mg/l	2	**0.0614**	**0.0132**	**0.31**	**0.0464**	**0.0869**	**0.164**	**0.113**	**0.244**	**0.156**	**0.0930**
Beryllium	mg/l	0.004	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Cadmium	mg/l	0.005	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Chromium	mg/l	0.1	0.0025*	<0.0100	0.00319*	0.00193*	<0.0100	0.00258*	<0.0100	0.00211*	<0.0100	<0.0100
Copper	mg/l	1.3	<0.0100	<0.0100	**0.0107**	0.00746*	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Lead	mg/l	0.015	0.00221*	0.00240*	0.00353*	0.00198*	0.00197*	**0.00755**	<0.0050	**0.0101**	0.00341*	**0.00308**
Nickel	mg/l	0.1	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Zinc	mg/l	1.1	0.00750*	<0.0500	**0.198**	0.00365*	<0.0500	**0.017**	<0.0500	0.00825*	<0.0500	<0.0500
Bis(2-chloro-1-methyl)ether	mg/l	0.00036	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bis(2-ethyhexyl)phthalate	mg/l	0.006	0.00151*	0.00175*	0.00234*	0.00194*	**0.606**	0.00218*	0.00165*	0.00149*	0.00134*	0.00125*
Phenol	mg/l	1.1	<0.010	<0.010	0.00251*	0.000432*	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1,1-Dichloroethane	mg/l	0.81	<0.0010	<0.0500	<0.0010	<0.0010	0.000496*	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethene	mg/l	0.007	<0.0010	0.0210*	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloroethane	mg/l	0.005	<0.0010	<0.0500	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
cis-1,2-Dichloroethene	mg/l	0.07	**0.0021**	**4.4**	<0.0010	<0.0010	**0.00101**	<0.0010	0.00033*	**0.00117**	0.000667*	<0.0010
trans-1,2-Dichloroethene	mg/l	0.1	<0.0010	**0.0498***	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1-Trichloroethane	mg/l	0.2	<0.0010	<0.0500	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/l	0.005	<0.0010	<0.0500	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichloroethene	mg/l	0.005	**0.0018**	**2.51**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Vinyl chloride	mg/l	0.002	<0.0010	**0.257**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.00053*	<0.0010	<0.0010

GWPS = Groundwater Protection Standards
Bold/shaded concentrations exceed the GWPS
Bold constituents exceed the Reporting limits
*J-flagged = Estimated concentrations
mg/l = milligrams per liter (parts per million)
Bis(2-chloro-1-methyl) ether = Bis(2-chloroisopropyl) ether

Table 6
March 30 and 31, 2016 Groundwater Data
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant

	Units	GWPS	MW-1R		MW-2R		MW-2BR		MW-2C		MW-3R		MW-5R		MW-6		MW-7		MW-8		MW-8B		MW-8C		MW-9		MW-9B		MW-12		MW-13		MW-14		MW-15		MW-16		MW-17	
Arsenic	mg/L	**0.01**	<0.01		**0.0221**		<0.01		<0.01		**0.00805**	J	**0.0166**		<0.01		<0.01		**0.0142**		**0.0094**	J	<0.01		**0.014**		0.00804	J	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Barium	mg/L	**2**	**0.0412**		**0.0138**		**0.32**		**0.0493**		**0.0743**		**0.144**		**0.0781**		**0.104**		**0.176**		**0.293**		**0.256**		**0.0753**		**0.259**		**0.0826**		**0.146**		**0.0928**		**0.0566**		**0.0329**		**0.0413**	
Beryllium	mg/L	**0.004**	<0.002		<0.002		<0.002		<0.002		<0.002		**0.000724**	J	<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002	
Cadmium	mg/L	**0.005**	<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002		<0.002	
Chromium	mg/L	**0.1**	**0.00225**	J	<0.01		**0.00367**	J	**0.01**		**0.00178**	J	**0.00265**	J	<0.01		<0.01		<0.01		**0.024**		<0.01		**0.00669**	J	**0.0449**		<0.01		<0.01		**0.00185**	J	<0.01		<0.01		**0.00176**	J
Copper	mg/L	**1.3**	<0.01		<0.01		<0.01		**0.00996**	J	<0.01		**0.0073**	J	<0.01		<0.01		<0.01		**0.0144**		<0.01		**0.015**		**0.0235**		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Lead	mg/L	**0.015**	<0.005		<0.005		<0.005		<0.005		<0.005		**0.00301**	J	<0.005		<0.005		<0.005		<0.005		<0.005		**0.00758**		**0.00929**		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005	
Nickel	mg/L	**0.1**	<0.01		<0.01		<0.01		**0.00973**	J	<0.01		<0.01		<0.01		<0.01		<0.01		**0.0179**		<0.01		**0.00993**	J	**0.0362**		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Zinc	mg/L	**1.1**	**0.0234**	J	<0.05		**0.0354**	J	**0.0696**		**0.0133**	J	**0.0339**	J	**0.00637**	J	<0.05		<0.05		**0.071**		**0.0082**	J	**0.028**	J	**0.0632**		**0.0142**	J	**0.012**	J	**0.0178**	J	<0.05		<0.05		**0.00596**	J
Acetone	mg/L	**0.055**	<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05	
Acrolein	mg/L	**4.2E-06**	<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05	
Acrylonitrile	mg/L	**0.000039**	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Benzene	mg/L	**0.005**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Bromobenzene	mg/L	**0.088**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Bromochloromethane	mg/L	**MDL**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Bromoform	mg/L	**0.008**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Bromomethane	mg/L	**0.00087**	<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005	
N-butylbenzene	mg/L	**0.024**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Sec-butylbenzene	mg/L	**0.024**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Tert-butylbenzene	mg/L	**0.024**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Carbon disulfide	mg/L	**0.1**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Carbon tetrachloride	mg/L	**0.005**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Chlorobenzene	mg/L	**0.1**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		**0.000666**	J	<0.001		<0.001		<0.001	
Chloroethane	mg/L	**0.0046**	<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005	
2-Chloro vinyl ether	mg/L	**MDL**	<0.05	J3|J4	<0.05	J3|J4	<0.05	J3|J4	<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05	
Chlorofrom	mg/L	**0.08**	<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		**0.000621**	J	<0.005	
Cholomethane	mg/L	**0.0016**	<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025	
2-Chlorotoluene	mg/L	**0.012**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
4-Chlorotoluene	mg/L	**2.6**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,2-Dibromo-3-chloropropane	mg/L	**0.0002**	<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005	
1,2-Dibromomethane	mg/L	**0.0005**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Dibromomethane	mg/L	**0.61**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,2-Dichlorobenzene	mg/L	**0.6**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		**0.00122**		<0.001		<0.001		<0.001	
1,3-Dichlorobenzene	mg/L	**0.018**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,4-Dichlorobenzene	mg/L	**0.075**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Dicholodofluoromethane	mg/L	**0.039**	<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005	
1,1-Dichloroethane	mg/L	**0.081**	<0.001		<0.001		<0.001		<0.001		**0.000536**	J	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		**0.000468**	J	<0.001	
1,2-Dichloroethane	mg/L	**0.005**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,1-Dichloroethene	mg/L	**0.007**	<0.001		**0.000876**	J	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Cis-1,2-Dichloroethene	mg/L	**0.07**	<0.001		**0.139**		**0.000461**	J	<0.001		**0.00144**		<0.001		**0.000454**	J	<0.001		**0.017**		**0.000366**	J	**0.0126**		**0.00252**		<0.001		**0.000619**	J	**0.000407**	J	**0.00273**		**0.000506**	J	**0.01**		<0.001	
Trans-1,2-Dichloroethene	mg/L	**0.1**	<0.001		**0.00365**		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		**0.00069**	J	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,2-Dichloropropane	mg/L	**0.005**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,1-Dichloropropene	mg/L	**MDL**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,3-Dichloropropane	mg/L	**0.12**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Cis-1,3-Dichloropropene	mg/L	**0.0004**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Trans-1,3-DDichloropropene	mg/L	**0.0004**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
2,2-Dichloropropane	mg/L	**MDL**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Ethylbenzene	mg/L	**0.7**	<0.001		**0.000401**	J	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
2-Hexanone	mg/L	**0.047**	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Isopropylbenzene	mg/L	**0.66**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
P-Isopropyltoluene	mg/L	**MDL**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
2-Buntanone (MEK)	mg/L	**0.7**	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Methylene Chloride	mg/L	**0.005**	<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005	
4-Methyl-2-Pentanone (MIBK)	mg/L	**0.2**	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
N-Propylbenzene	mg/L	**1.3**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Styrene	mg/L	**0.1**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,1,1,2-Tetrachloroethane	mg/L	**0.00043**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,1,2,2-Tetrachloroethane	mg/L	**0.000055**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Tetrachloroethene	mg/L	**0.005**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		**0.00128**		<0.001		<0.001		<0.001	
Toluene	mg/L	**1**	<0.005		**0.00196**	J	<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005	
1,2,3-Trichlorobenzene	mg/L	**0.029**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,1,1-Trichloroethane	mg/L	**0.2**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,1,2-Trichloroethane	mg/L	**0.005**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Trichloroethene	mg/L	**0.005**	<0.001		**0.0494**		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		**0.000718**	J	<0.001		**0.0016**		<0.001	
Trichlorofluoromethane	mg/L	**0.13**	<0.001		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005		<0.005	
1,2,3-Trichloropropane	mg/L	**5.6E-06**	<0.005		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025		<0.0025	
1,2,4-Trimethylbenzene	mg/L	**0.0012**	<0.0025		**0.00138**		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,3,5-Trimethylbenzene	mg/L	**0.0012**	<0.001		**0.000553**	J	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Vinyl Chloride	mg/L	**0.002**	<0.001		**0.0394**		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		**0.0213**		<0.001		**0.008**		**0.000955**	J	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	

Table 6
March 30 and 31, 2016 Groundwater Data
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant

	Units	GWPS	MW-1R		MW-2R		MW-2BR		MW-2C		MW-3R		MW-5R		MW-6		MW-7		MW-8		MW-8B		MW-8C		MW-9		MW-9B		MW-12		MW-13		MW-14		MW-15		MW-16		MW-17	
Xylenes, Ttotal	mg/L	**10**	<0.001		**0.00199**	J	<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003	
Chrysene	mg/L	**0.0092**	<0.003		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Dibenz(a,h)anthracene	mg/L	**9.2E-06**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Dibenzofuran	mg/L	**0.0012**	<0.001		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Fluoranthene	mg/L	**0.15**	<0.01		**0.000409**	J	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Fluorene	mg/L	**0.024**	<0.001		**0.000782**	J	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Hexachlorobenzene	mg/L	**0.001**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Hexachloro-1,3-Butadiene	mg/L	**0.00086**	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Hexachloroethane	mg/L	**0.0048**	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Indeno(1,2,3-cd)pyrene	mg/L	**0.000092**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Isophorone	mg/L	**0.071**	<0.01		<0.01		**0.000488**	J	**0.00096**	J	<0.01		<0.01		<0.01		<0.01		<0.01		**0.00187**	J	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Naphthalene	mg/L	**0.00062**	<0.001		**0.000965**	J	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Nitrobenzene	mg/L	**0.00034**	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
N-Nitrosodiphenylamine	mg/L	**0.014**	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Phenanthrene	mg/L	**0.0469**	<0.001		**0.0011**		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
Di-n-butyl phthalate	mg/L	**0.36**	<0.003		<0.003		<0.003		<0.003		<0.003		**0.000326**	J	<0.003		<0.003		**0.000318**	J	<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003	
Diethyl phthalate	mg/L	**2.9**	<0.003		**0.000308**	J	**0.000848**	J	**0.000509**	J	<0.003		<0.003		<0.003		<0.003		<0.003		**0.000335**	J	<0.003		**0.000636**	J	<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003	
Dimethyl phthalate	mg/L	**36**	<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003	
Di-n-octyl phthalate	mg/L	**0.15**	<0.003		<0.003		**0.00887**		**0.00211**	J	<0.003		<0.003		<0.003		<0.003		<0.003		**0.00347**		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003		<0.003	
Pyrene	mg/L	**0.018**	<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001		<0.001	
1,2,4-Trichlorobenzene	mg/L	**0.07**	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Pentachlorophenol	mg/L	**0.001**	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Phenol	mg/L	**1.1**	<0.01		<0.01		**0.00082**	J	**0.00349**	J	<0.01		<0.01		<0.01		<0.01		<0.01		**0.00421**	J	<0.01		<0.01		**0.000628**	J	<0.01		<0.01		<0.01		<0.01		<0.01		<0.01	
Gross alpha	pCi/l	**15**	<3.86		**5.48**		**1.80**		<4.94		**6.22**		<4.95		<4.97		<4.05		<4.53		<4.90		<4.96		**11.8**		**13.6**		<4.92		<4.79		<4.89		<4.91		<4.98		<4.82	
Gross Beta	pCi/l	**50**	**6.59**		**23.9**		**2.63**		<3.33		**5.27**		**4.36**		**11.6**		**3.28**		<4.96		**13.3**		<3.71		**18.1**		**17.4**		<3.39		**10.6**		**5.78**		**7.46**		**3.53**		**2.53**	

GWPS = Groundwater Protection Standards **RDL = Reporting Detection Limit**
Detected Constituents above RDL are in bold **mg/L = milligrams per liter (parts per million)**
Bold/shaded concentrations exceed the GWPS **PCi/l = picocuries per liter**

Table 6. Summary of Groundwater Analytical Data - September 28, 2016
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant

Constituent	Units	GWPS	MW-1R	MW-2R	MW-2BR	MW-2C	MW-3R	MW-5R	MW-6	MW-8	MW-12	MW-13
Arsenic	mg/l	0.01	**0.0238**	**0.0269**	<0.0100	<0.0100	**0.0106**	**0.0566**	**0.0135**	**0.0194**	<0.0100	0.00978*
Barium	mg/l	2	**0.328**	**0.0226**	**0.316**	**0.0460**	**0.0914**	**0.431**	**0.215**	**0.242**	**0.095**	**0.153**
Beryllium	mg/l	0.004	**0.00372**	<0.00200	<0.00200	<0.00200	<0.00200	**0.00256**	<0.00200	<0.00200	<0.0020	<0.0020
Cadmium	mg/l	0.005	**0.00168**	<0.00200	<0.00200	<0.00200	<0.00200	**0.000769**	<0.00200	<0.00200	<0.0020	<0.0020
Chromium	mg/l	0.1	**0.0263**	0.00531*	0.00356*	0.00324*	0.00628*	**0.0457**	**0.0106**	0.00434*	0.00386*	0.00343*
Copper	mg/l	1.3	**0.0715**	<0.0100	<0.0100	<0.0100	<0.0100	**0.0366**	<0.0100	<0.0100	<0.0100	<0.0100
Lead	mg/l	0.015	**0.0333**	0.00222*	<0.00500	<0.00500	0.00245*	**0.057**	**0.0132**	0.00440*	<0.00500	0.00209*
Nickel	mg/l	0.1	**0.0781**	0.00929*	0.00583*	0.00579*	0.00600*	**0.0266**	0.00933*	0.00500*	<0.0100	<0.0100
Zinc	mg/l	1.1	**0.263**	0.0140*	**0.0601**	0.0345*	**0.0503**	**0.211**	0.0289*	0.00822*	<0.0500	<0.0500
Bis(2-chloro-1-methyl)ether	mg/l	0.00036	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bis(2-ethyhexyl)phthalate	mg/l	0.006	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Phenol	mg/l	1.1	<0.010	<0.010	0.000412*	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00100
1,1-Dichloroethane	mg/l	0.81	<0.00100	<0.00100	<0.00100	<0.00100	0.000364*	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
1,1-Dichloroethene	mg/l	0.007	<0.00100	**0.0211**	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
1,2-Dichloroethane	mg/l	0.005	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
cis-1,2-Dichloroethene	mg/l	0.07	<0.00100	**4.08**	<0.00100	<0.00100	**0.00104**	<0.00100	0.000744*	0.000342*	<0.00100	0.000459*
trans-1,2-Dichloroethene	mg/l	0.1	<0.00100	**0.0721**	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
1,1,1-Trichloroethane	mg/l	0.2	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
1,1,2-Trichloroethane	mg/l	0.005	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Trichloroethene	mg/l	0.005	<0.00100	**1.86**	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Vinyl chloride	mg/l	0.002	<0.00100	**0.211**	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100

GWPS = Groundwater Protection Standards
Bold/shaded concentrations exceed the GWPS
Bold constituents exceed the Reporting limits
*J-flagged = Estimated concentrations
mg/l = milligrams per liter (parts per million)
Bis(2-chloro-1-methyl) ether = Bis(2-chloroisopropyl) ether

Table 6
March 15,16, and 17, 2017 Groundwater Data
Mueller Property Holdings, LLC
Former North Birmingham Pipe Plant

	Units	GWPS	MW-1R	MW-2R	MW-2BR	MW-2C	MW-3R	MW-5R	MW-6	MW-7	MW-8	MW-8B	MW-8C	MW-9	MW-9B	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17
Arsenic	mg/L	**0.01**	**0.0166**	**0.0192**	<0.0065	<0.0065	0.00805 J	<0.0065	0.00947 J	0.00688 J	**0.0293**	<0.0065	<0.0065	0.00846 J	<0.0065	0.00857 J	<0.0065	**0.0122**	<0.0065	<0.0065	<0.0065
Barium	mg/L	**2**	**0.0978**	**0.0197**	**0.336**	**0.0426**	**0.112**	**0.11**	**0.158**	**0.177**	**0.23**	**0.19**	**0.249**	**0.0586**	**0.163**	**0.0961**	**0.17**	**0.157**	**0.0512**	**0.0285**	**0.0457**
Beryllium	mg/L	**0.004**	**0.00251**	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007
Cadmium	mg/L	**0.005**	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007
Chromium	mg/L	**0.1**	**0.0221**	0.0025 J	0.00145 J	<0.0014	0.00668 J	0.00394 J	0.00627 J	0.00754 J	0.00381 J	<0.0014	<0.0014	0.00591 J	<0.0014	<0.0014	<0.0014	0.00492 J	<0.0014	<0.0014	<0.0014
Copper	mg/L	**1.3**	**0.0145**	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	0.00648 J	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	0.00731 J	<0.0053	<0.0053	<0.0053
Lead	mg/L	**0.015**	**0.0151**	<0.0019	<0.0019	<0.0019	0.00402 J	0.00267 J	0.00489 J	**0.00625**	**0.00562**	0.00246 J	<0.0019	0.00464 J	0.00211 J	<0.0019	<0.0019	0.00463 J	<0.0019	<0.0019	0.00239 J
Nickel	mg/L	**0.1**	**0.0245**	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	0.00506 J	<0.0049	<0.0049	<0.0049	0.00841 J	<0.0049	<0.0049	<0.0049
Zinc	mg/L	**1.1**	**0.078**	0.00639 J	0.00815 J	<0.0059	0.01 J	0.0128 J	0.0101 J	0.0109 J	0.00873 J	<0.0059	<0.0059	0.0084 J	<0.0059	**0.0533**	<0.0059	0.0398 J	<0.0059	<0.0059	0.00776 J
Acrolein	mg/L	**4.2E-06**	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887	<0.00887
Acrylonitrile	mg/L	**0.000039**	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187	<0.00187
Bis(2-chloroisopropyl)ether	mg/L	**0.00036**	<0.000525	<0.000405	<0.000405	<0.000405	<0.000405	<0.000405	<0.000405	<0.000494	<0.000445	<0.000445	<0.000405	<0.000405	<0.000405	<0.000405	<0.000405	<0.000405	<0.000405	<0.000405	<0.000405
Bis(2-ethylhexyl)phthalate	mg/L	**0.006**	<0.000837	<0.000645	<0.000645	<0.000645	<0.000645	<0.000645	0.00125 J	<0.000787	<0.000709	<0.000709	<0.000645	<0.000645	0.00107 J	<0.000645	<0.000645	<0.000645	<0.000645	<0.000645	0.00151 J
1,2-Dibromo-3-chloropropane	mg/L	**0.0002**	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133	<0.00133
1,2-Dibromomethane	mg/L	**0.0005**	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381	<0.000381
Dibenz(a,h)anthracene	mg/L	**9.2E-06**	<0.000329	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.00031	<0.000279	<0.000279	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254
1,1-Dichloroethane	mg/L	**0.081**	<0.000259	<0.000259	<0.000259	<0.000259	0.000621 J	<0.000259	<0.000259	<0.000259	<0.000259	<0.000259	<0.000259	<0.000259	<0.000259	<0.000259	<0.000259	<0.000259	0.000306 J	**0.0014**	<0.000259
1,2-Dichloroethane	mg/L	**0.005**	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361	<0.000361
1,1-Dichloroethene	mg/L	**0.007**	<0.000398	0.000972 J	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398
Cis-1,2-Dichloroethene	mg/L	**0.07**	<0.00026	**0.164**	0.000689 J	<0.00026	**0.00171**	<0.00026	0.000434 J	<0.00026	0.000445 J	0.000698 J	**0.0134**	**0.00161**	<0.00026	0.000429 J	0.000902 J	**0.00254**	**0.00107**	**0.0249**	<0.00026
Trans-1,2-Dichloroethene	mg/L	**0.1**	<0.000396	**0.00337**	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	0.000442 J	<0.000396
Cis-1,3-Dichloropropene	mg/L	**0.0004**	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418	<0.000418
Trans-1,3-Dichloropropene	mg/L	**0.0004**	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419	<0.000419
Indeno(1,2,3-cd)pyrene	mg/L	**0.000092**	<0.000329	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.00031	<0.000279	<0.000279	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254	<0.000254
Vinyl Chloride	mg/L	**0.002**	<0.000259	**0.0405**	**0.00248**	<0.000259	<0.000259	<0.000259	<0.000259	<0.000259	0.000717 J	<0.000259	**0.0112**	**0.00125**	<0.000259	<0.000259	0.000635 J	<0.000259	<0.000259	<0.000259	<0.000259
Naphthalene	mg/L	**0.00062**	<0.000439	**0.00169**	<0.000338	<0.000338	<0.000338	<0.000338	<0.000338	<0.000413	<0.000372	<0.000372	<0.000338	<0.000338	<0.000338	<0.000338	<0.000338	<0.000338	<0.000338	<0.000338	<0.000338
Pentachlorophenol	mg/L	**0.001**	<0.000369	<0.000285	<0.000285	<0.000285	<0.000285	<0.000285	<0.000285	<0.000347	<0.000313	<0.000313	<0.000285	<0.000285	<0.000285	<0.000285	<0.000285	<0.000285	<0.000285	<0.000285	<0.000285
1,1,2,2-Tetrachloroethane	mg/L	**0.000055**	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013
1,2,3-Trichloropropane	mg/L	**5.6E-06**	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807	<0.000807
1,1,1-Trichloroethane	mg/L	**0.2**	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319	<0.000319
1,1,2-Trichloroethane	mg/L	**0.005**	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383	<0.000383
Trichloroethene	mg/L	**0.005**	<0.000398	**0.0628**	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	0.000742 J	0.000547 J	**0.00356**	<0.000398

GWPS = Groundwater Protection Standards
Detected Constituents above RDL are in bold
Bold/shaded concentrations exceed the GWPS

RDL = Reporting Detection Limit
mg/L = milligrams per liter (parts per million)
PCi/l = picocuries per liter

Table 6. Summary of Groundwater Analytical Data - September 13, 2017
U.S. Pipe and Foundry Company
North Birmingham Pipe Plant

Constituent	Units	GWPS	MW-1R	MW-2R	MW-2BR	MW-2C	MW-3R	MW-5R	MW-6	MW-8	MW-12	MW-13
Arsenic	mg/l	0.01	<0.0100	**0.0136**	<0.0100	<0.0100	<0.0100	**0.0225**	**0.0161**	**0.140**	<0.0100	0.0183
Barium	mg/l	2	**0.661**	**0.0241**	**0.307**	**0.0435**	**0.131**	**0.342**	**0.293**	**0.474**	**0.104**	**0.274**
Beryllium	mg/l	0.004	0.00117*	<0.00200	<0.00200	<0.00200	<0.00200	0.00125*	0.000972*	0.000730*	<0.00200	0.000826*
Cadmium	mg/l	0.005	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	0.00181*	<0.00200	<0.0020
Chromium	mg/l	0.1	0.00361*	<0.0100	<0.0100	0.00324*	0.00280*	**0.0267**	**0.0104**	**0.192**	<0.0100	0.00506*
Copper	mg/l	1.3	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	**0.0204**	0.00710*	**0.0174**	<0.0100	0.00676*
Lead	mg/l	0.015	0.00352*	<0.00500	<0.00500	<0.00500	<0.00500	**0.0273**	**0.00925**	**0.0383**	<0.00500	**0.0193**
Nickel	mg/l	0.1	**0.0101**	<0.0100	<0.0100	0.00579*	0.00600*	**0.0127**	**0.0104**	**0.0223**	<0.0100	<0.0100
Zinc	mg/l	1.1	0.0281*	<0.0500	0.0129*	0.0345*	0.00641*	**0.0876**	**0.0270**	**0.0529**	0.0123*	0.0195*
Bis(2-chloro-1-methyl)ether	mg/l	0.00036	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bis(2-ethyhexyl)phthalate	mg/l	0.006	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300
Phenol	mg/l	1.1	<0.010	<0.010	<0.010	0.00258*	0.00668*	0.00216*	0.00174*	0.00152*	0.00270*	0.000539*
1,1-Dichloroethane	mg/l	0.81	<0.00100	<0.00100	<0.00100	<0.00100	0.000663*	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
1,1-Dichloroethene	mg/l	0.007	<0.00100	**0.00043**	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
1,2-Dichloroethane	mg/l	0.005	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
cis-1,2-Dichloroethene	mg/l	0.07	<0.00100	**0.0562**	0.000537*	<0.00100	**0.00155**	<0.00100	0.000875*	**0.0165**	0.000859*	0.000452*
trans-1,2-Dichloroethene	mg/l	0.1	<0.00100	**0.00232**	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	0.000876*	<0.00100	<0.00100
1,1,1-Trichloroethane	mg/l	0.2	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
1,1,2-Trichloroethane	mg/l	0.005	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Trichloroethene	mg/l	0.005	<0.00100	**0.0102**	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Vinyl chloride	mg/l	0.002	<0.00100	**0.0535**	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	**0.0166**	<0.00100	<0.00100

GWPS = Groundwater Protection Standards
Bold/shaded concentrations exceed the GWPS
Bold constituents exceed the Reporting limits
*J-flagged = Estimated concentrations
mg/l = milligrams per liter (parts per million)
Bis(2-chloro-1-methyl) ether = Bis(2-chloroisopropyl) ether

APPENDIX I
TABLE III.2 OF THE CURRENT
PART B POST-CLOSURE CARE PERMIT

TABLE III.2

GROUNDWATER QUALITY MONITORING CONSTITUENTS*

HAZARDOUS CONSTITUENT	UNIT*
Arsenic	Landfill
Barium	Landfill
Beryllium	Landfill
Cadmium	Landfill
Chromium	Landfill
Copper	Landfill
Lead	Landfill
Nickel	Landfill
Zinc	Landfill
Bis(2-chloro-1-methylethyl)ether	Landfill
Bis(2-ethylhexyl)phthalate	Landfill
1,1-Dichloroethane	Landfill
1,2-Dichloroethane	Landfill
1,1-Dichloroethylene	Landfill
cis-1,2-Dichloroethylene	Landfill
trans-1,2-Dichloroethylene	Landfill
1,1,1-Trichloroethane	Landfill
1,1,2-Tichloroethane	Landfill
Trichloroethylene	Landfill
Vinyl Chloride	Landfill

The constituents listed herein are the subset of the Groundwater Protection Standard listed in Table III.3 for which monitoring is required.

* Identifies the unit(s) at which the given constituent must be monitored.

APPENDIX J
TABLE III.3 OF THE CURRENT
PART B POST-CLOSURE CARE PERMIT

TABLE III.3

GROUNDWATER PROTECTION STANDARD

Bis(2-chloroisopropyl)ether

HAZARDOUS CONSTITUENT	UNIT*	CONCENTRATION LIMIT (mg/L)
Arsenic	Landfill	0.01
Barium	Landfill	2
Beryllium	Landfill	0.004
Cadmium	Landfill	0.005
Chromium	Landfill	0.1
Copper	Landfill	1.3
Lead	Landfill	0.015
Nickel	Landfill	0.1
Zinc	Landfill	1.1
Acrolein	Landfill	0.0000042
Acrylonitrile	Landfill	0.000039
Bis(2-chloro-1-methylethyl)ether	Landfill	0.00036
Bis(2-ethylhexyl)phthalate	Landfill	0.006
1,2-Dibromo-3-chloropropane	Landfill	0.0002
1,2-Dibromoethane	Landfill	0.00005
Dibenzo(A,H)Anthracene	Landfill	0.0000092
1,1-Dichlorethane	Landfill	0.081
1,2-Dichloroethane	Landfill	0.005
1,1-Dichlorethene	Landfill	0.007
cis-1,2-Dichlorethene	Landfill	0.07
trans-1,2-Dichloroethene	Landfill	0.1
cis-1,3-Dichloropropene	Landfill	0.0004
trans-1,3-Dichloropropene	Landfill	0.0004
Indeno (123-CD) Pyrene	Landfill	0.000092
Vinyl Chloride	Landfill	0.002
Naphthalene	Landfill	0.00062
Pentachlorophenol	Landfill	0.001
1,1,2,2-Tetrachloroethane	Landfill	0.000055
1,2,3-Trichloropropane	Landfill	0.0000056
1,1,1-Trichloroethane	Landfill	0.2
1,1,2-Trichloroethane	Landfill	0.005
Trichloroethene	Landfill	0.005

APPENDIX K
PROPOSED TABLE III.2 AND III.3

Appendix K Groundwater Quality Monitoring Constituents and Groundwater Protection Standards
OSP, LLC - Birmingham, Alabama

Hazardous Constituent	Unit	Concentration Limit (mg/L)
Arsenic, total	Landfill	0.01
Barium, total	Landfill	2
Beryllium, total	Landfill	0.004
Cadmium, total	Landfill	0.005
Chromium, total	Landfill	0.1
Copper, total	Landfill	1.3
Lead, total	Landfill	0.015
Nickel, total	Landfill	0.02
Zinc, total	Landfill	0.6
Bis(2-ethylhexyl)phthalate (117-81-7)	Landfill	0.006
1,1-Dichloroethane (75-34-3)	Landfill	0.0028
1,2-Dichloroethane (107-06-2)	Landfill	0.005
1,1-Dichloroethylene (75-35-4)	Landfill	0.007
cis-1,2-Dichloroethylene (156-59-2)	Landfill	0.07
trans-1,2-Dichloroethylene (156-60-5)	Landfill	0.1
1,1,1-Trichloroethane (71-55-6)	Landfill	0.2
1,1,2-Trichloroethane (79-00-5)	Landfill	0.005
Trichloroethylene (79-01-6)	Landfill	0.005
Vinyl Chloride (75-01-4)	Landfill	0.002