

# GEC

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CONSULTANTS, INC

May 22, 2015

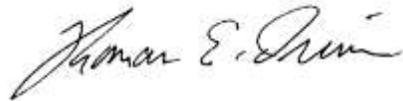
Mr. David Hayes  
Response and Remediation Program Georgia Department of  
Natural Resources  
2 Martin Luther King Jr. Drive, SE, Suite 1462 East Atlanta, Georgia 30334

**Subject: Voluntary Investigation and Remediation Plan  
Former Macon 2 MGP Facility Macon, Georgia  
HSI #10692  
GEC Project No.: 130659.241**

Dear Mr. Hayes:

Attached please find one hard copy and two cd copies of the *Voluntary Investigation and Remediation Plan* for the Macon 2 MGP Facility located in Macon Georgia.

Should you have any questions, please do not hesitate to contact me. Sincerely,



Thomas E. Driver, P.E.  
President  
Ga. Reg. #17394

Attachments

# Voluntary Investigation and Remediation Plan

## PREPARED FOR

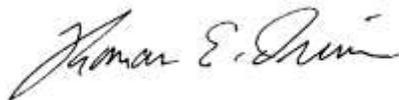
Former Macon 2 MGP Facility  
Macon, Georgia HSI #10692

## PREPARED BY

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## ISSUE DATE

May 22, 2015



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Thomas E. Driver, P.E.  
President  
GA Reg. #17394

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Sampling Results from Williams Environmental Services, Inc. CSR dated  
June 17, 2002, Revised September 5, 2003.
- D Compliance Status Investigation Report, Dated June 17, 2002, Revised  
September 5, 2003 by Williams Environmental Services, Inc.

## **1.0 INTRODUCTION**

### **1.1 PURPOSE**

The Macon 2 MGP which is owned by Macon-Bibb County (County) was previously listed on the Hazardous Site Inventory (HSI) as Site #10692. The site was investigated and a Compliance Status Report (CSR) was approved on 12/19/2003 certifying compliance with Type 4 Risk Reduction Standards (RRS) for soil. Groundwater was certified as compliant with Type 1 RRS. EPD also approved a Corrective Action Plan (CAP) for the Macon 2 MGP on January 4, 2006 which required a deed notice on the property. In order to comply with the CAP, a Consent Order was executed to prevent placing, permitting or approving any residential purpose on the Site. The "Site" is defined as the area shown within the polygon shaped area depicted on Figure 2 (Appendix C).

For the purpose of this VIRP, only three parcels and two right-of-ways are subject to the Type 4 RRS and consequently restricted to nonresidential uses. These include the following:

Parcel No. OC-98-5J (R071-0316 in tax map included in Appendix B)  
Parcel No. OC-99-4A (R073-0398 in tax map included in Appendix B)  
Parcel No. OC-99-9-4AB (R073-0033 in tax map included in Appendix B)  
Portions of Right-of-Way of Willow Street  
Portions of Right-of-Way of Spring Street Lane

Macon-Bibb County now wishes to modify the current site restrictions to allow residential use of the entire property in order to provide more opportunities for redevelopment while maintaining important limitations in some areas. The extent of contamination has been defined both horizontally and vertically; however Macon-Bibb County is submitting this Voluntary Remediation Program (VRP) Application to describe additional investigation and possible corrective action that will be needed in order to demonstrate the Site's suitability for residential development to a depth of fifteen feet and provide the basis for changing the current property use restrictions.

This VRP application is not designed to revisit the basis for the delisting or previously approved CSR, only to further characterize contamination in the upper fifteen feet of the Site in order to enable a corrective action plan to be developed that will result in remediation to Residential Risk Reduction Standards within these depths at the site.

It is anticipated that once the upper 15 feet of soils within the polygon are

approved for residential use, a Uniform Environmental Covenant (UEC) will be issued and the current Consent Order will be revised to include restrictions below 15 feet, including a corrective action plan which will detail requirements necessary for any excavation or other disturbance of soil below 15 feet in the existing polygon. This corrective action plan will be designed to insure the protection of construction workers.

## **1.2 *QUALIFYING PROPERTIES & PARTICIPANT ELIGIBILITY***

The site meets the eligibility criteria for the VRP. The qualifying properties included in the VRP application are provided on Figure 2 (Appendix C). The properties are all owned by Macon-Bibb County.

The property is not listed on the National Priorities List (NPL), is not currently undergoing response activities required by an order of the Regional Administrator of the United States Environmental Protection Agency (USEPA), or is a facility required to have a permit under Official Code of Georgia (O.C.G.A) Section 12-8-66. There are currently no outstanding liens filed against the property pursuant to O.C.G.A Sections 12-8-96 and 12-13-12. Qualifying the property under the VRP would not violate the terms and conditions under which the division operates and administers remedial programs by delegation or by similar authorization from the USEPA. In addition, qualification of the indicated property would not violate any order, judgment, statute, rule or regulation subject to the enforcement authority of the Director of the EPD. In the event additional affected properties are identified, Macon-Bibb County will notify EPD and revise the VIRP accordingly.

## **2.0 *SITE BACKGROUND AND HISTORY***

### **2.1 *MANUFACTURED GAS PLANT SITE DESCRIPTION***

The former Macon 2 MGP facility is located to the north of the intersection of Spring Street Lane and Willow Street (Figure 1). The site description and location was addressed in the approved CSR for the site and will not be addressed herein. For the purpose of this evaluation, the VIRP is focused on the upper 15 feet of fill above the former MGP site and the properties included in the CSR. Some samplings up to 18 feet below grade will also be performed to concerns of potential vapor intrusion.

## **2.2 SOURCES OF RELEASE**

Sources which potentially have or are contributing to a release of a hazardous constituent or substance at the former MGP facility were defined during several investigations at the site and were addressed in the CSR.

As stated in the CSR, in addition to the former MGP structures, fill material used to develop the property may be a potential source of regulated substances. The former MGP facility and surrounding properties were backfilled on several occasions to reach the current topography. Fill thickness ranges from 4.5 feet to the west of the former MGP facility to approximately 36 feet on the eastern portion and to the southeast of the former MGP facility. The fill material consists of silts, sands, and clays consistent with the area lithology and construction debris including brick, concrete, glass, and asphalt. The upper fifteen to 18 feet of this fill material will be the subject of this investigation.

## **2.3 REGULATORY HISTORY**

### **2.3.1 Summary of Previous Investigations**

#### **2.3.1.1 Law Environmental Studies**

Law Environmental, Inc. (LAW) conducted a Preliminary Assessment (PA) of the Site in 1991 which included a review of available file material, on-site and off-site reconnaissance, review of historical property ownership and a limited pathway survey. No sampling or analysis was conducted during the PA.

#### **2.3.1.2 Williams Environmental Services Studies**

The Compliance Status Investigation Report (CSR) for the site was initiated by Williams Environmental Services in June of 2002 and the Revised CSR was submitted on September 5, 2003. According to the CSR, thirty-five HSRA regulated substances were detected in soil or groundwater at the site.

The soil contaminants encountered during the site investigation and shown to be within the area of non-residential RRS were compared to Type 1 and/or Type 2 RRS. Type 1 or 2 RRS for soils at the site were exceeded by two semi-volatile organic compounds: benzo(a)pyrene and dibenzo(a,h)anthracene. Type 1 or 2 RRS for soils were exceeded by two inorganics: arsenic and lead.

The area in which residential RRS are exceeded in soil are shown on Figure 2.

The groundwater contaminates encountered at the site were compared to Type 1 RRS. None of the constituents encountered in the groundwater sampling performed at the site were above Type 1 RRS.

### **3.0            *CONCEPTUAL SITE MODEL***

A Conceptual Site Model (CSM) will be developed based on the data obtained during the implementation of the VIRP and prior data obtained during historic documentation from previous reports. The objective of the CSM will be to illustrate current site conditions and describe the processes that control the transport, migration, and possible impacts to potential human ecological receptors. A discussion of the various components to be included in the CSM are included in the sections below.

### **3.1            *GEOLOGY***

#### **3.1.1            *Regional Geology***

The southern part of Macon, Bibb County, Georgia, is located in the Atlantic Coastal Plain Physiographic province and the northern part is in the Piedmont province. The Fall Line is defined as an arbitrary line that separates the two physiographic regions and is why this region is sometimes referred to as the Fall Line District. The Coastal Plain province in Bibb County is characterized by distinctive light-colored sandy hills of Cretaceous age that slope gently towards the southeast. The Piedmont province is characterized by a rolling to hilly upland area of moderate relief that slopes gently to the south.

The former Macon 2 MGP facility is located in the vicinity of the Fall Line between the Atlantic Coastal Plain and the Piedmont Province, approximately 200 feet southwest of the Ocmulgee River. Elevations in the investigation area range from approximately 300 to 320 feet above mean sea level (USGS Topographic Map Macon .West and Macon East, Georgia; Figure 1). The area is underlain by Pleistocene- to recent-age alluvial deposits up to 40 feet thick. These alluvial deposits are described as unsorted sand, gravel and clay (LeGrand, 1962). Below the alluvial deposits, the Late Eocene upper sand member of the Barnwell Formation, if present, lies unconformably above the Cretaceous-age Tuscaloosa Formation, if present. The upper sand of the Barnwell Formation is described as deep red clayey sand (LeGrand and others, 1956). The Tuscaloosa Formation consists of fine to coarse, subangular, micaceous, arkosic sands that are interbedded with gray to green, locally iron-

stained kaolinitic, micaceous sandy clays (Herrick and Vorhis, 1963). The base of the Tuscaloosa in this area dips slightly to the southeast at approximately 30 feet per mile and lies unconformably above the much older crystalline rocks below. The Paleozoic and older igneous and metamorphic rock lie at a depth of approximately 50 feet bgs (LeGrand, 1962).

According to the City of Macon Water Department, the Ocmulgee River is the only source of drinking water in the Macon water system. The intake is located on the Ocmulgee River approximately three miles upstream from the former Macon 2 MGP facility (Figure 5). Towards the south and west there is an increase in well usage; the Tuscaloosa sands gradually increase in thickness allowing for more availability of water from wells. Recharge to the Tuscaloosa occurs in outcrop areas west of the Ocmulgee River. Natural discharge from the Tuscaloosa is into the Flint and Ocmulgee Rivers and smaller streams crossing the outcrop area (Pollard and Vorhis, 1980).

### **3.1.2 Site Geology**

The geology encountered during the CSI consisted of unconsolidated alluvial clays, sands, gravels, and clays, saprolite (a clayey silt to fine sand), and a mafic to felsic gneiss bedrock (Figure 6). Cross sections A-A' through C-C' (Figures 7, 8, and 9) were prepared to illustrate the Site geology. Fill material consisting of sand, silt, clay, gravel, construction debris and asphalt was encountered from the ground surface to depths ranging from approximately 0.5 to 36 feet bgs. The fill material is thicker on the northern and eastern portions of the Site, where the 20 foot embankment was previously located (see 1889 Sanborn Fire Insurance map). Underlying the fill material across most of the Site is an alluvial deposit that consists primarily of micaceous silts and clays with some fine to coarse sand and gravel in scattered lenses. The alluvium also contains some deposited organic matter such as leaves and wood fragments. Alluvium was not encountered in borings installed to the south and southwest of the property or on the southwest corner of the property in the vicinity of Gas Holder No. 1. The alluvial deposit, where encountered, ranges in thickness from 5 to 35 feet at the Site and is encountered at the surface in borings (SB-30 through SB-31) installed along the west side of the Ocmulgee River. The alluvial deposit lies unconformably above the saprolite. The saprolite in the area of the Site is generally a micaceous silt and very fine sand that is characterized by relic foliation and other structures associated with igneous and metamorphic rock. Saprolite was encountered at depths ranging from 4.5 feet (in SB-36, located southwest of the former MGP property) to 61 feet bgs. The depth at which saprolite is encountered increases towards the river and was not observed to a total depth of 64 feet in boring SB-43 located southeast of the former MGP property. Where encountered, the thickness of the saprolite ranges from a few inches to four feet thick and is thickest on the south and southwest portions of the Site. The underlying bedrock consists of a

mafic to felsic gneiss and, where encountered, ranges in depth from six feet to 62 feet bgs. The bedrock appears to slope to the east and northeast of the Site towards the Ocmulgee River.

### 3.2 *SITE HYDROLOGY AND HYDROGEOLOGY*

Figure 5 (Site Map and Surface/Storm Water Flow Path) in the Williams CSR (Appendix D) identifies the flow paths of surface water at the Site and surrounding areas. Storm water at the former MGP property flows to various storm drains located at the facility (Figure 3 in Appendix D) or as a sheet flow over the embankment located on the eastern boundary of the property. Storm water that flows towards the embankment accumulates in standing pools on the western side of the Norfolk Southern Railway and eventually seeps through the railway gravel bed and to the Ocmulgee River. Stormwater which falls on up-gradient properties including the Exxon station, Pizza Hut restaurant, Burger King restaurant, and Conoco Station, flows into either storm drains that feed into storm drains located at the facility, as surface flow over the embankment previously mentioned, or into a drainage located on the southwestern side of the Spring Street bridge. Storm water that flows into the drainage located on the southwestern side of the Spring Street Bridge empties into the Ocmulgee River at a point on the southeastern side of the bridge (Figure 5, Appendix D).

Hydrogeology at the Site was evaluated by the use of six monitoring wells (this includes four installed during the SI and two installed during the CSI). The uppermost portion of the surficial aquifer is located in fill material across the Site. Cross-sections A-A', B-B', and C-C' (Figures 7, 8, and 9, Appendix D) indicate the relationship of the top of groundwater with geologic units at the Site. Monitoring wells MW-1 through MW-5 are all screened within the fill material. Monitoring well MW-6 is screened within the alluvium. The fill material consists of clays and silty clays with abundant debris including concrete, brick, and asphalt. The matrix of the fill material does not appear very porous; however, due to the abundance of debris that creates void spaces within the fill material, wells screened within the fill material exhibited high conductivity values. The base of the alluvium in locations of the eastern area of the Site contains an alluvial clay which in some areas lies directly above the saprolite; this and the underlying saprolite appear to serve as an aquitard consisting of clays, silty clays, and clayey silts. A mafic to felsic gneiss bedrock underlies the saprolite. Based on water level measurements obtained on March 29, 2001, the top of the water table ranges from 9.5 (MW-01) to 25.61 feet bgs (MW-04). Water level measurements obtained from MW-06 were not used in determining the water table elevations due to the fact that it is screened

below the top of groundwater. In addition, the proximity of MW-04 to MW-06 and their relative water levels indicate a downward flow gradient with the upper water bearing zone. Groundwater under the former MGP facility has a horizontal flow to the east and northeast. Three surface water bodies are located near the facility. The first is a drainage ditch located to the northwest of the former MGP property that feeds into the Ocmulgee River in the vicinity of the Spring Street Bridge. Another drainage ditch is located approximately 130 feet southeast of the former MGP property and feeds into a drainage on the west side of the Norfolk Southern Railway. Based on field observations made during a period of heavy rainfall, the railway drainage has no obvious flow direction but most likely seeps through the railroad base material and into the Ocmulgee River. The third is the Ocmulgee River which is located approximately 250 feet to the east/northeast of the facility and appears to be a gaining water body.

### **3.3**      ***EXPOSURE ASSESSMENT***

The former CSR addressed the risk at the site for non-residential use. The investigation and subsequent VRP application will address the potential for residential use on the property. Therefore, the potential exposure will be to a resident living on the property. The investigation to be performed will be on the upper 15 to 18 feet of soil at the site to determine the potential for residential use.

In addition to the evaluation of the site for residential use, the VRP application will address the potential exposure of construction workers at the site and will propose corrective action needed during construction to protect these workers.

#### **3.3.1**      ***Potential Receptors***

The potential receptors are future residents residing on the property. In addition, potential exposure of construction workers at the site will be addressed.

#### **3.3.2**      ***Exposure Media and Potential Exposure Pathways***

This section identifies the potential exposure pathways and exposure routes (ingestion, dermal contact, inhalation) for COIs for the property, if applicable, and associated potential receptors.

##### **3.3.2.1**      ***Surface Soil***

Incidental ingestion and dermal contact with surface soil (i.e., the upper 2 feet of soil) are considered potentially complete pathways for receptors in areas where COI's are present in surface soil.

The potential receptors are future residents on the property.

### **3.3.2.2        *Subsurface Soil***

The potential receptors are future residents living on the property and construction workers working in soil below the 15 foot depth approved for residential development.

### **3.3.2.3        *Groundwater***

The prior CSR performed at the site confirmed that the Groundwater meets Type I RRS. No actions or investigations relative to groundwater at the site are proposed.

### **3.3.2.4        *Indoor Air***

The former Macon 2 MGP site is identified to have a low potential for Vapor Intrusion (VI.) It is recognized that EPD requires consideration of the VI pathway for VRP sites. A technical evaluation of the VI pathway will be performed using the results from the sampling for volatile organic components, including benzene, toluene, ethylbenzene, and xylenes (BTEX) and Naphthalene, which are highly volatile and are often encountered at MGP sites. In addition, vapor samples will be collected at varying depths in two locations on the site as described below.

## **4.0            *PLANNED INVESTIGATIONS***

The following Sections describe planned investigations to fulfill VRP requirements.

### **4.1            *Soil Sampling***

As discussed, the goal of the VRP is to allow for the development of the site for residential use. To that end, the soil sampling plan is focused on the upper fifteen feet of soil at the site. Based on the CSR (samples shown as SB-xx) reports, the

only samples above the highest Residential RRS for the particular constituents at the site include the following:

SB-4C 21.5-23.5' Benzo(a)anthracene at 37 mg/kg, Benzo(b)fluoranthene at 27 mg/kg, Indeno(1,2,3-cd)pyrene at 15 mg/kg, Benzo(a)pyrene at 26 mg/kg  
SB-14 16-20' Benzo(a)pyrene at 6.8 mg/kg, Dibenzo(a,h)anthracene at 3.5 mg/kg  
SB-14 24-28' Benzo(a)pyrene at 10.0 mg/kg, Dibenzo(a,h)anthracene at 4.2 mg/kg  
SB-17 16-20' Benzo(a)pyrene at 5.0 mg/kg, Dibenzo(a,h)anthracene at 2.3 mg/kg  
SB-24 2-4' Benzo(a)pyrene at 2.9 mg/kg  
SB-25 2-4' Benzo(a)pyrene at 11.0 mg/kg  
SB-41 19-24' Benzo(a)pyrene at 2.2 mg/kg  
SB-42 2-4' Benzo(a)pyrene at 5.6 mg/kg  
SB-20 0-2' Arsenic at 31.5 mg/kg  
SB-23 14-19 Lead at 298 mg/kg  
SB-24 8-12' Lead at 338 mg/kg  
SB-27 8-12' Lead at 634 mg/kg  
SB-41 24-29' Lead at 484 mg/kg  
SB-45 10-12' Lead at 425 mg/kg  
SB-45 15-17' Lead at 1070 mg/kg

The test locations are shown on the attached Figure 2 in Appendix C.

Based on our review of the CSR report, and in consideration of the above, the following sampling locations are proposed (see attached Figure 2 in Appendix C for test locations):

GB-1 0-0.5', 0.5'-2'  
GB-2 0-0.5', 0.5'-2'  
GB-3 0-0.5', 0.5'-2', 8-10', 13-15'  
GB-4 0-0.5', 0.5'-2'  
GB-5 0-0.5', 0.5'-2', 8-10', 13-15', 18'  
GB-6 0-0.5', 0.5'-2'  
GB-7 0-0.5', 0.5'-2', 8-10', 13-15', 18'  
GB-8 0-0.5', 0.5'-2'  
GB-9 0-0.5', 0.5'-2', 8-10', 13-15'  
GB-10 0-0.5', 0.5'-2'  
GB-11 0-0.5', 0.5'-2', 3-5', 8-10', 13-15'

GB-12	0-0.5', 0.5'-2'
GB-13	0-0.5', 0.5'-2'
GB-14	0-0.5', 0.5'-2', 3-5', 8-10', 13-15'
GB-15	0-0.5', 0.5'-2'
GB-16	0-0.5', 0.5'-2'
GB-17	0-0.5', 0.5'-2'
GB-18	0-0.5', 0.5'-2'
GB-19	0-0.5', 0.5'-2', 8-10', 13-15'
GB-20	0-0.5', 0.5'-2'
GB-21	0-0.5', 0.5'-2', 8-10', 13-15'
GB-22	0-0.5', 0.5'-2'
GB-23	0-0.5', 0.5'-2'
GB-24	0-0.5', 0.5'-2'
GB-25	0-0.5', 0.5'-2'
GB-26	0-0.5', 0.5'-2'
GB-27	0-0.5', 0.5'-2', 3-5', 8-10', 13-15'
GB-28	2-4', 8-10', 13-15'
SB-17	8-10', 13-15'
SB-20	0-2', 2-4'
SB-24	2-4', 4-6', 8-10', 13-15'
SB-25	0-2', 2-4', 4-6', 8-10', 13-15'
SB-41	4-6', 8-10', 13-15'
SB-42	2-4', 4-6', 8-10', 13-15'

All samples will be tested for SVOC's and metals. Test locations GB-5 and GB-7, both located in the area of former Gas Holders from the MGP sitewill also be sampled and tested for the BTEX constituents.

All soil samples will be collected with a skid steer mounted Geoprobe rig or tracked CME 45 drill rig. All downhole equipment will be decontaminated prior to use and between sampling locations. All samples will be collected by on site environmental professionals using approved sampling methods and procedures and shipped using proper protocols. All analysis will be performed by a laboratory certified in the State of Georgia.

#### **4.2 Groundwater Sampling**

Since no groundwater contamination has been encountered above Type 1 RRS, no additional groundwater sampling is proposed or will be performed.

#### **4.3 Vapor Intrusion**

Potential vapor intrusion at the site will be addressed by sampling in two locations at the site. The locations are the former Gas Holder No. 1 (boring location GB-5) and the former Gas Holder No. 2 (boring location GB-7). Tar Like Material (TLM) and Oil Like Material (OLM) were encountered in both of these areas during previous studies at the site at depths of 13 feet or greater. Sampling at depths of 9-10' and 4-5' will be performed using a nested tube methodology. This method consists of the burial of a small diameter Teflon tube at the required depth and the collection of a soil gas sample after a 24 hour stabilization period. The tubing will be buried using either a direct push system or drilled borehole. Clean sand will be used around the sample tip, and the remainder of the borehole will be sealed with a bentonite-water slurry.

A sample of the gas in each sampling point will be collected into a 1 liter stainless steel Summa Canister with a pre-set flow controller set for a 10 minute collection period. The canister will then be sealed and labeled, and submitted to the laboratory for VOC and SVOC analysis.

In addition, Vapor intrusion studies will be performed using the sampling data obtained during the onsite investigations. The vapor evaluation will be performed using the Johnson & Ettinger (1991) Model (JEM) for Subsurface Vapor Intrusion into buildings to assess the potential vapor risk. The JEM estimates indoor air concentrations and associated health risks associated with vapor intrusion based on site specific characteristics.

## 5.0 *Type I Risk Reduction Standards*

The following Type I Risk Reduction Standards in soil are proposed for delineation of contamination at the site. Remediation standards will be proposed in future correspondence.

Constituent	Type 1 RRS (mg/kg)
<i><b>Inorganics</b></i>	
Arsenic	20
Barium	1,000
Beryllium	2
Cadmium	2
Chromium	100
Copper	100
Lead	75
Mercury	0.5
Nickel	50

Vanadium	100
Zinc	100
Total Cyanide	20
Constituent	Type 1 RRS (mg/kg)
<b><i>VOC's</i></b>	
Benzene	0.5
Ethylbenzene	70
Toluene	100
Xylenes	1000
Carbon Disulfide	400
Methylene chloride	0.5
<b><i>SVOC's</i></b>	
Acenaphthene	300
Acenaphthylene	130
Acetophenone	400
Anthracene	500
Benzo(a)anthracene	5
Benzo(a)pyrene	1.64
Benzo(b)fluoranthene	5
Benzo(k)fluoranthene	5
Benzo(g,h,i)perylene	500
Chrysene	5
Dibenz(a,h)Anthracene	2
Fluoranthene	500
Fluorene	360
Indeno(1,2,3-cd)pyrene	5
Naphthalene	100
Phenanthrene	110
Phenol	400
Pyrene	500

## 6.0

### ***PROJECT SCHEDULE***

The site investigation for the Site will be completed within 90 days of acceptance into the VRP Program. Corrective action, if necessary, will be completed and the Site will be certified as meeting Risk Reduction Standards within five years of acceptance into the VRP Program.

**7.0**

***REFERENCES***

Compliance Status Investigation Report, Former Macon 2 MGP Facility, Macon, Ga. Williams Environmental Services, Inc. Preparation Date June 17, 2003, Revised September 5, 2003.

# APPENDICES

# **APPENDIX A**

# Voluntary Investigation and Remediation Plan Application Form and Checklist

VRP APPLICANT INFORMATION					
<b>COMPANY NAME</b>	Macon-Bibb County				
<b>CONTACT PERSON/TITLE</b>	Mayor Robert Reichert				
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GEORGIA CERTIFIED PROFESSIONAL GEOLOGIST OR PROFESSIONAL ENGINEER OVERSEEING CLEANUP					
<b>NAME</b>	Thomas E. Driver		<b>GA PE/PG NUMBER</b>	PE17394	
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<b>PHONE</b>	478-757-1606	<b>FAX</b>		<b>E-MAIL</b>	<a href="mailto:tdriver@geconsultants.com">tdriver@geconsultants.com</a>
APPLICANT'S CERTIFICATION					
<p>In order to be considered a qualifying property for the VRP:</p> <p>(1) The property must have a release of regulated substances into the environment;</p> <p>(2) The property shall not be:</p> <p style="padding-left: 20px;">(A) Listed on the federal National Priorities List pursuant to the federal Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. Section 9601.</p> <p style="padding-left: 20px;">(B) Currently undergoing response activities required by an order of the regional administrator of the federal Environmental Protection Agency; or</p> <p style="padding-left: 20px;">(C) A facility required to have a permit under Code Section 12-8-66.</p> <p>(3) Qualifying the property under this part would not violate the terms and conditions under which the division operates and administers remedial programs by delegation or similar authorization from the United States Environmental Protection Agency.</p> <p>(4) Any lien filed under subsection (e) of Code Section 12-8-96 or subsection (b) of Code Section 12-13-12 against the property shall be satisfied or settled and released by the director pursuant to Code Section 12-8-94 or Code Section 12-13-6.</p> <p>In order to be considered a participant under the VRP:</p> <p>(1) The participant must be the property owner of the voluntary remediation property or have express permission to enter another's property to perform corrective action.</p> <p>(2) The participant must not be in violation of any order, judgment, statute, rule, or regulation subject to the enforcement authority of the director.</p> <p>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 fine and imprisonment for knowing violations.</p> <p>I also certify that this property is eligible for the Voluntary Remediation Program (VRP) as defined in Code Section 12-8-105 and I am eligible as a participant as defined in Code Section 12-8-106.</p>					
<b>APPLICANT'S SIGNATURE</b>					
<b>APPLICANT'S NAME/TITLE (PRINT)</b>	Mayor, Macon-Bibb County			<b>DATE</b>	

QUALIFYING PROPERTY INFORMATION (For additional qualifying properties, please refer to the last page of application form)			
HAZARDOUS SITE INVENTORY INFORMATION (if applicable)			
HSI Number	Former HSI Site # 10692	Date HSI Site listed	January 5, 2001
HSI Facility Name	Former Macon 2 MGP Facility	NAICS CODE	221210
PROPERTY INFORMATION			
TAX PARCEL ID	OC-98-5J; OC-99-4A; OC-99-9-4AB; Portions of Willow St, ROW	PROPERTY SIZE (ACRES)	7.03
PROPERTY ADDRESS	Intersection of Spring Street Lane and Willow Street, Macon Georgia		
CITY	Macon	COUNTY	Bibb
STATE	Georgia	ZIPCODE	31201
LATITUDE (decimal format)	32.842402700	LONGITUDE (decimal format)	-83.628753000
PROPERTY OWNER INFORMATION			
PROPERTY OWNER(S)	Macon-Bibb County	PHONE # 478-751-7170	
MAILING ADDRESS	700 Poplar Street, PO Box 274		
CITY	Macon	STATE/ZIPCODE	Georgia/31202-0247
ITEM #	DESCRIPTION OF REQUIREMENT	Location in VRP (i.e. pg., Table #, Figure #, etc.)	For EPD Comment Only (Leave Blank)
1.	<b>\$5,000 APPLICATION FEE</b> IN THE FORM OF A CHECK PAYABLE TO THE GEORGIA DEPARTMENT OF NATURAL RESOURCES. (PLEASE LIST CHECK DATE AND CHECK NUMBER IN COLUMN TITLED "LOCATION IN VRP." PLEASE DO NOT INCLUDE A SCANNED COPY OF CHECK IN ELECTRONIC COPY OF APPLICATION.)	<b>Check #: 20183 Check Date: 2/24/15</b>	
2.	<b>WARRANTY DEED(S)</b> FOR QUALIFYING PROPERTY.	<b>Appendix B</b>	
3.	<b>TAX PLAT</b> OR OTHER FIGURE INCLUDING QUALIFYING PROPERTY BOUNDARIES, ABUTTING PROPERTIES, AND TAX PARCEL IDENTIFICATION NUMBER(S).	<b>Appendix B</b>	
4.	<b>ONE (1) PAPER COPY AND TWO (2) COMPACT DISC (CD) COPIES</b> OF THE VOLUNTARY REMEDIATION PLAN IN A SEARCHABLE PORTABLE DOCUMENT FORMAT (PDF).	<b>Enclosed</b>	
5.	The VRP participant's initial plan and application must include, using all reasonably available current information to the extent known at the time of application, a graphic three-dimensional preliminary conceptual site model (CSM) including a preliminary remediation plan with a table of delineation standards, brief supporting text, charts, and figures (no more than 10 pages, total) that illustrates the site's surface and subsurface setting, the known or suspected source(s) of contamination, how contamination might move within the environment, the potential human health and ecological receptors, and the complete or incomplete exposure pathways that may exist at the site; the preliminary CSM must be updated as the investigation and remediation progresses and an up-to-date CSM must be included in each semi-annual status report submitted to the director by the participant; a <b>PROJECTED MILESTONE SCHEDULE</b> for investigation and remediation of the site, and	<b>Section 4, page 7-8 &amp; Appendix C, Figure 2  Section 5, page 9 Section 6, page 10</b>	

	<p>after enrollment as a participant, must update the schedule in each semi-annual status report to the director describing implementation of the plan during the preceding period. A Gantt chart format is preferred for the milestone schedule.</p> <p>The following four (4) generic milestones are required in all initial plans with the results reported in the participant's next applicable semi-annual reports to the director. The director may extend the time for or waive these or other milestones in the participant's plan where the director determines, based on a showing by the participant, that a longer time period is reasonably necessary:</p>		
5.a.	Within the first 12 months after enrollment, the participant must complete horizontal delineation of the release and associated constituents of concern on property where access is available at the time of enrollment;		
5.b.	Within the first 24 months after enrollment, the participant must complete horizontal delineation of the release and associated constituents of concern extending onto property for which access was not available at the time of enrollment;		
5.c.	Within 30 months after enrollment, the participant must update the site CSM to include vertical delineation, finalize the remediation plan and provide a preliminary cost estimate for implementation of remediation and associated continuing actions; and		
5.d.	Within 60 months after enrollment, the participant must submit the compliance status report required under the VRP, including the requisite certifications.		
6.	<p><b>SIGNED AND SEALED PE/PG CERTIFICATION AND SUPPORTING DOCUMENTATION:</b></p> <p>"I certify under penalty of law that this report and all attachments were prepared by me or under my direct supervision in accordance with the Voluntary Remediation Program Act (O.C.G.A. Section 12-8-101, <u>et seq.</u>). I am a professional engineer/professional geologist who is registered with the Georgia State Board of Registration for Professional Engineers and Land Surveyors/Georgia State Board of Registration for Professional Geologists and I have the necessary experience and am in charge of the investigation and remediation of this release of regulated substances.</p> <p>Furthermore, to document my direct oversight of the Voluntary Remediation Plan development, implementation of corrective action, and long term monitoring, I have attached a monthly summary of hours invoiced and description of services provided by me to the Voluntary Remediation Program participant since the previous submittal to the Georgia Environmental Protection Division.</p> <p>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."</p> <p>Thomas E. Driver, P.E., GA Reg. #17394</p> <p>Printed Name and GA PE/PG Number _____</p> <p><i>Thomas E. Driver</i></p> <p>Signature and Stamp _____</p> <p style="text-align: right;">May 21, 2015 Date</p> 		

**ADDITIONAL QUALIFYING PROPERTIES (COPY THIS PAGE AS NEEDED)**

<b>PROPERTY INFORMATION</b>			
TAX PARCEL ID	R-O-W Willow Street	PROPERTY SIZE (ACRES)	.09
PROPERTY ADDRESS	0863 Willow Street		
CITY	Macon	COUNTY	Bibb
STATE	GA	ZIPCODE	31201
LATITUDE (decimal format)	32.841814400	LONGITUDE (decimal format)	-83.628753000
<b>PROPERTY OWNER INFORMATION</b>			
PROPERTY OWNER(S)	City of Macon	PHONE #	478-751-7110
MAILING ADDRESS	700 Poplar Street		
CITY	Macon	STATE/ZIPCODE	GA/31202

<b>PROPERTY INFORMATION</b>			
TAX PARCEL ID	R-O-W Spring Street Lane	PROPERTY SIZE (ACRES)	.0027
PROPERTY ADDRESS			
CITY	Macon	COUNTY	Bibb
STATE	GA	ZIPCODE	31201
LATITUDE (decimal format)	32.841814400	LONGITUDE (decimal format)	-83.627843900
<b>PROPERTY OWNER INFORMATION</b>			
PROPERTY OWNER(S)	City of Macon	PHONE #	478-751-7110
MAILING ADDRESS	700 Poplar Street		
CITY	Macon	STATE/ZIPCODE	GA/31202

# **APPENDIX B**



# Macon/Bibb County

## Board of Tax Assessors

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### Owner and Parcel Information

Owner Name	MACON-BIBB COUNTY URBAN DEVE	Today's Date	May 20, 2015
Mailing Address	305 COLISEUM DRIVE	Parcel Number	R071-0316
	MACON, GA 31201	Tax District	08 (District 08)
Location Address	861 WILLOW ST	2014 Millage Rate	08
Legal Description		Acres	2.55
Property Class(NOTE: Not Zoning Info)	E1-Exempt	Neighborhood	Residual, 1100, SF
Zoning	CBD-2	Homestead Exemption	No (\$0)
Landlot/District	/	Parcel Map	<a href="#">Show Parcel Map</a>

### 2015 Tax Year Value Information

Land Value	Improvement Value	Accessory Value	Total Value	Previous Value
\$ 305,911	\$ 791,216	\$ 2,222	\$ 1,099,349	\$ 1,099,349

### Land Information

Type	Description	Calculation Method	Square Footage	Acres	Photo
RES	1102	Square Feet	111078	2.55	NA

### Improvement Information

Description	Value	Actual Year Built	Effective Year Built	Square Feet	Wall Height	Wall Frames	Exterior Wall
Governmental Buildings	\$ 493,506	1960		17,082	20		
Roof Cover	Interior Walls	Floor Construction	Floor Finish	Ceiling Finish	Lighting	Heating	Sketch
						002-0	<a href="#">Sketch Building 1</a> <a href="#">Show Photo</a>
Description	Value	Actual Year Built	Effective Year Built	Square Feet	Wall Height	Wall Frames	Exterior Wall
Governmental Buildings	\$ 297,710	1960		4,947	20		
Roof Cover	Interior Walls	Floor Construction	Floor Finish	Ceiling Finish	Lighting	Heating	Sketch
						002-0	<a href="#">Sketch Building 2</a> <a href="#">Show Photo</a>

### Accessory Information

Description	Year Built	Dimensions/Units	Value
ASPH PAVING	1960	0x0 2027	\$ 2,222

### Sale Information

Sale Date	Deed Book / Page	Plat Book / Page	Sale Price	Reason	Grantor	Grantee
01/24/2013	8919 115		\$ 0	GOVERNMENT TO GOVT	CITY OF MACON	MACON-BIBB COUNTY URBAN DEVELOPMENT AUTH
10/17/1977	1308 308	1308	\$ 10	CONVERSION OF PAST SALES	MACON-BIBB COUNTY URBAN DEV AUTHORITY	CITY OF MACON

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The Assessor's Office makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation. The assessment information is from the last certified taxroll. All data is subject to change before the next certified taxroll. Website Updated: May 15, 2015

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Cross-reference:  
Deed book 8919  
Page 115-117



Doc ID: 010857150005 Type: GLR  
Recorded: 01/24/2014 at 08:30:00 AM  
Fee Amt: \$18.00 Page 1 of 5  
Bibb County Superior Court  
Erica Woodford Clerk

BK 9180 PG 322-326

Return to: Blake C. Sharpton, Peck, Shaffer & Williams, LLP, 435 2<sup>nd</sup> Street, Suite 204, Macon, GA 31201 (478) 803-8051

### QUITCLAIM DEED

BIBB COUNTY, GEORGIA

THIS INDENTURE is made as of December 4, 2013, by and between **MACON-BIBB COUNTY URBAN DEVELOPMENT AUTHORITY ("Grantor")**, and **CITY OF MACON ("Grantee")**.

#### WITNESSETH:

For and in consideration of Ten and 00/100 Dollars (\$10.00) and other good and valuable considerations, the receipt and sufficiency whereof are hereby acknowledged, Grantor has this day bargained, sold and does by these presents bargain, sell, remise, release and forever quitclaim to Grantee, and the heirs, successors, executors, administrators and assigns of Grantee, that certain real property lying and being in Bibb County, Georgia, more particularly described in EXHIBIT "A" attached hereto and made a part hereof by reference (the "Property").

Notwithstanding anything herein to the contrary, this conveyance is expressly made subject to those certain matters set forth in EXHIBIT "B" attached hereto and made a part hereof by reference.

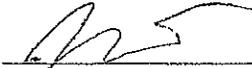
This deed is given for the purpose of forever releasing and quit-claiming any interest the Grantor has now or ever had in the Property.

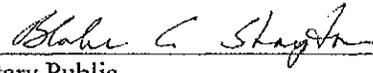
TO HAVE AND TO HOLD the said described premises unto Grantee, its successors, successors-in-title and assigns, so that neither the Grantor nor any person or persons claiming under Grantor shall at any time, claim or demand any right, title or interest to the Property or its appurtenances.

[EXECUTION APPEARS ON FOLLOWING PAGE]

IN WITNESS WHEREOF, Grantor has hereunto set its hand and affixed its seal as of the day and year above written.

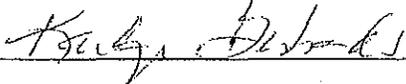
Signed, sealed and delivered  
in the presence of:

  
\_\_\_\_\_  
Unofficial Witness

  
\_\_\_\_\_  
Notary Public

[NOTARY SEAL]

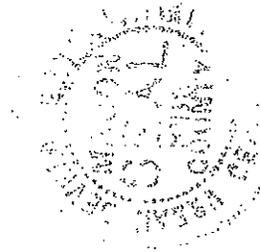
MACON-BIBB COUNTY URBAN  
DEVELOPMENT AUTHORITY, a public  
body corporate and politic

By:   
\_\_\_\_\_

Typed Name: Kathryn Gerhardt

Office: Vice-Chair

[CORPORATE SEAL]



**EXHIBIT "A"**

**LEGAL DESCRIPTION**

All that tract or parcel of land situate, lying and being in Square 98 and Square 99 of Old City, Macon, Bibb County, Georgia, and Portions of closed streets therein, said property being more particularly described according to a plat prepared by Joe A. Witherington, City Engineer, dated September 15, 1977, revised January 1978 and recorded in Deed Book 1320, Page 820, Clerk's Office, Bibb Superior Court.

This is the same parcel that was conveyed to the MACON-BIBB COUNTY URBAN DEVELOPMENT AUTHORITY by Quitclaim Deed from the CITY OF MACON dated January 24, 2013 and recorded in deed book 8919, page 115-117, Clerk's Office, Bibb Superior Court.

The Property is known by the current system of street numbering as 801 Riverside Drive, was formerly known as 861 Willow Street, and is commonly referred to as the "Central Services Tract."

**EXHIBIT "B"**

**EXCEPTIONS**

LESS and except those parcels conveyed to Georgia Power Company as described in deed book 6698, page 352, and Atlanta Gas Light Company as described in deed book 6698, page 336, Clerk's Office, Bibb Superior Court.

200 American Fed.

352393

State of Georgia,

BIBB

County

CC-98 6-15

In Consideration of \$10.00 and other valuable considerations, Dollars, to Grantor paid, receipt of which is hereby acknowledged, MACON-BIBB COUNTY URBAN DEVELOPMENT AUTHORITY of Bibb County, Georgia hereinafter referred to as Grantor, has this day bargained and sold, and does hereby transfer and convey, unto CITY OF MACON, GEORGIA of its successors, heirs, executors, administrators and assigns, hereinafter referred to as Grantee, the following described property, to-wit:

All that tract or parcel of land situate, lying and being in Square 98 and Square 99 of Old City, Macon, Bibb County, Georgia, and Portions of closed Streets therein, said property being more particularly described as follows:

Beginning at a railroad iron located at a point where the northeasterly line of original 20' Alley through Square 98 intersects with the southeasterly line of original 10' Alley running through said Square 98, and from said beginning point running along said northeasterly line of said original 20' Alley a distance of 164.25 feet; thence running N 36° 00' E a distance of 104.25 feet; thence running S 54° 00' E a distance of 50 feet to a point; thence N 36° 00' E a distance of 224.25 feet to a point; thence running S 54° 00' E a distance of 104.25 feet to a point; thence N 36° 04' E a distance of 18.4 feet, more or less, to the right of way of Southern Railroad Company property; thence running S 33° 33' E along the right of way of Southern Railroad Company property a distance of 361.3 feet; thence running S 36° 00' W a distance of 63.04 feet; thence running S 54° 00' E a distance of 80.70 feet; thence running S 36° 00' W a distance of 40 feet; thence running N 54° 00' W a distance of 283.3 feet; thence running S 71° 45' 34" W a distance of 215.48 feet to the southeasterly side of said original 10' Alley; thence running N 36° 00' E along the southeasterly side of said original 10' Alley to the point of beginning.

All according to a plat prepared by Joe A. Witherington, City Engineer, dated September 15, 1977, as a plat of City Electronics Shop, City of Macon, a copy of said plat being attached to and made a part of a deed from Georgia Bank & Trust Company to Macon-Bibb County Urban Development Authority.

RECEIVED  
CLERK'S OFFICE  
OCT 19 PM 1:42  
SUPERIOR COURT OF  
BIBB COUNTY, GEORGIA

GEORGIA, Bibb County, Clerk's Office Superior Court  
Filed for Record OCT 19 1977 at 1:42 PM  
Recorded OCT 20 1977  
Dep. Clerk

Said Grantee, and the successors, heirs, executors, administrators and assigns of said Grantee to have and to hold said lot of land and its appurtenances forever, in Fee Simple.

Each of the undersigned warrants the title to said described premises unto the said Grantee, and the successors, heirs, executors, administrators, and assigns of Grantee, against the claims of Grantors, its successors, transferees, or assigns, or any person claiming thereunder.

Wherever the words "Grantor" and "Grantee" are used herein the same shall be construed to include, when appropriate, either gender and both singular and plural, and the grammatical construction of sentences shall conform thereto.

Witness the hand and seal of Grantor, this 17<sup>th</sup> day of October, 1977.

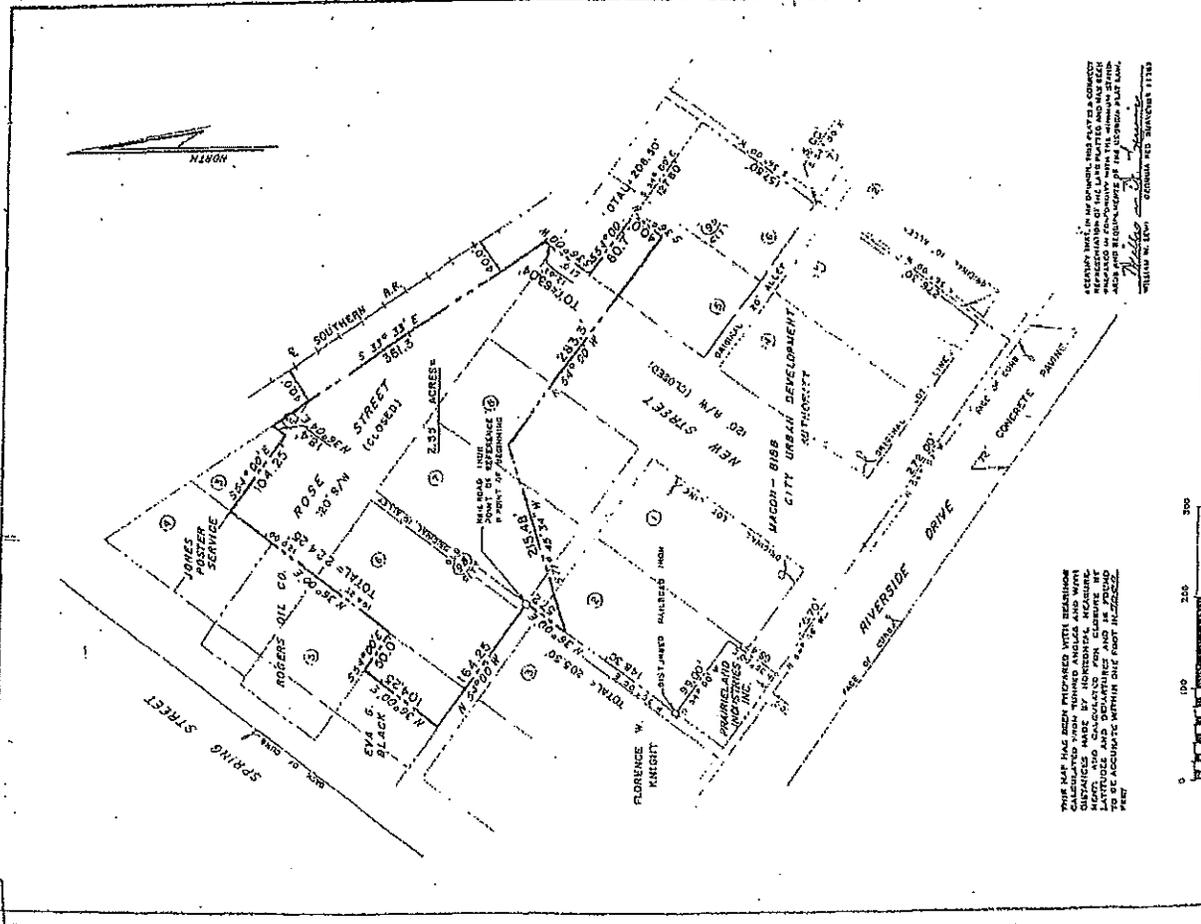
Signed, sealed and delivered in the presence of:

*James R. Roberts*  
Notary Public  
MY COMMISSION EXPIRES JANUARY, 12, 1980

MACON-BIBB COUNTY URBAN DEVELOPMENT AUTHORITY

By: *[Signature]* (I, S.)  
Title *[Signature]*  
By: *[Signature]* (I, S.)  
Title *[Signature]*

BOOK 1308 PAGE 310



PLAT OF PROPERTY  
 FOR  
 CITY ELECTRONICS SHOP  
 CITY OF MACON  
 LOCATION: PART OF SQUARES 98 & 99  
 480 F. S.

THIS MAP HAS BEEN PREPARED WITH REGARDANCE  
 TO THE ACTS OF PARLIAMENT AND THE  
 STATUTES IN THAT BEHALF MADE AND WITH  
 CARE AND ACCURACY FOR THE PURPOSES  
 TO BE ACCURATE WITHIN ONE FOOT IN  
 ANY LINE



ACCEPTED FOR RECORD THIS 15th DAY OF SEPTEMBER  
 1988 BY THE CLERK OF SUPERIOR COURT  
 AND REGISTERED PROFESSIONAL SURVEYOR  
 WILLIAM W. LEWIS



# Macon/Bibb County

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### Owner and Parcel Information

Owner Name	CITY OF MACON	Today's Date	May 20, 2015
Mailing Address	P O BOX 247	Parcel Number	R073-0398
	MACON, GA 31201-0247	Tax District	08 (District 08)
Location Address	815 RIVERSIDE DR	2014 Millage Rate	08
Legal Description	O C	Acres	2.75
Property Class(NOTE: Not Zoning Info)	E1-Exempt	Neighborhood	Major Strip, 3100, SF
Zoning	CBD-2	Homestead Exemption	No (S0)
Landlot/District	/	Parcel Map	<a href="#">Show Parcel Map</a>

### 2015 Tax Year Value Information

Land Value	Improvement Value	Accessory Value	Total Value	Previous Value
\$ 923,463	\$ 0	\$ 0	\$ 923,463	\$ 923,463

### Land Information

Type	Description	Calculation Method	Square Footage	Acres	Photo
RES	3110	Square Feet	119929	2.75	NA

### Improvement Information

No improvement information associated with this parcel.

### Accessory Information

Description	Year Built	Dimensions/Units	Value
No accessory information associated with this parcel.			

### Sale Information

Sale Date	Deed Book / Page	Plat Book / Page	Sale Price	Reason	Grantor	Grantee
03/31/1981	1403 286		\$ 10	CONVERSION OF PAST SALES	MACON-BIBB COUNTY URBAN DEV AUTHORITY	CITY OF MACON

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APR 2 1981 - 8 30 AM

MTA PROPERTY

Bill City Mason  
Act sent to James Elliott  
JC MS B

446260

BOOK 1403 PAGE 286 LIMITED WARRANTY DEED

STATE OF GEORGIA

COUNTY OF BIBB

IN CONSIDERATION of Ten and 00/100 (\$10.00) Dollars and other valuable consideration, to Grantor paid, the receipt of which is hereby acknowledged MACON-BIBB COUNTY URBAN DEVELOPMENT AUTHORITY of Bibb County, Georgia, hereinafter referred to as Grantor, has this day bargained and sold, and does hereby transfer and convey unto the CITY OF MACON, GEORGIA, its successors or assigns, hereinafter referred to as Grantee, the following described property, to-wit:

All that tract or parcel of land situate, lying and being in Square 98 and Square 99 of Old City, Macon, Bibb County, Georgia, and portions of closed streets therein, said property being more particularly described as follows:

Beginning at a railroad iron located at a point where the northeasterly line of original 20 foot alley to Square 98 intersects with the southeasterly line of original 10 foot alley running through said Square 98 and from said beginning point running south 36 degrees 00 minutes west a distance of 57.2 feet to the point of beginning; thence running north 71 degrees 45 minutes 34 seconds east a distance of 215.48 feet to a point; thence running south 54 degrees 00 minutes east a distance of 248.60 feet to a point; thence running south 36 degrees 00 minutes west a distance of 387.60 feet to a point; thence running north 54 degrees 57 minutes west a distance of 104.50 feet to a point; thence running north 54 degrees 46 minutes west a distance of 170.70 feet to a point; thence running north 36 degrees 00 minutes east distance of 68.47 feet to a point; thence running north 54 degrees 00 minutes west a distance of 99.00 feet to a point; thence running north 36 degrees 00 minutes east a distance of 148.30 feet to the point of beginning.

All according to a plat prepared by Joe A. Witherington, City Engineer, dated March 20th, 1981, a copy of said plat being attached to and made a part of this instrument.

Said Grantee, and the successors, heirs, executors, administrators and assigns of said Grantee to have and to hold said lot of land and its appurtenances forever, in Fee Simple.

Each of the undersigned warrants the title to said described premises unto the said Grantee, and the successors,

heirs, executors, administrators, and assigns of Grantee, against the claims of Grantor, its successors, transferees, or assigns, or any person claiming thereunder.

Wherever the words "Grantor" and "Grantee" are used herein the same shall be construed to include, when appropriate, either gender and both singular and plural, and the grammatical construction of sentences shall conform thereto.

WITNESS the hand and seal of Grantor, this 31 day of MARCH, 1981.

MACON-BIBB COUNTY URBAN DEVELOPMENT AUTHORITY

BY: [Signature] CHAIRMAN  
(Title)

ATTEST: [Signature] Exec. Dir.  
(Title)

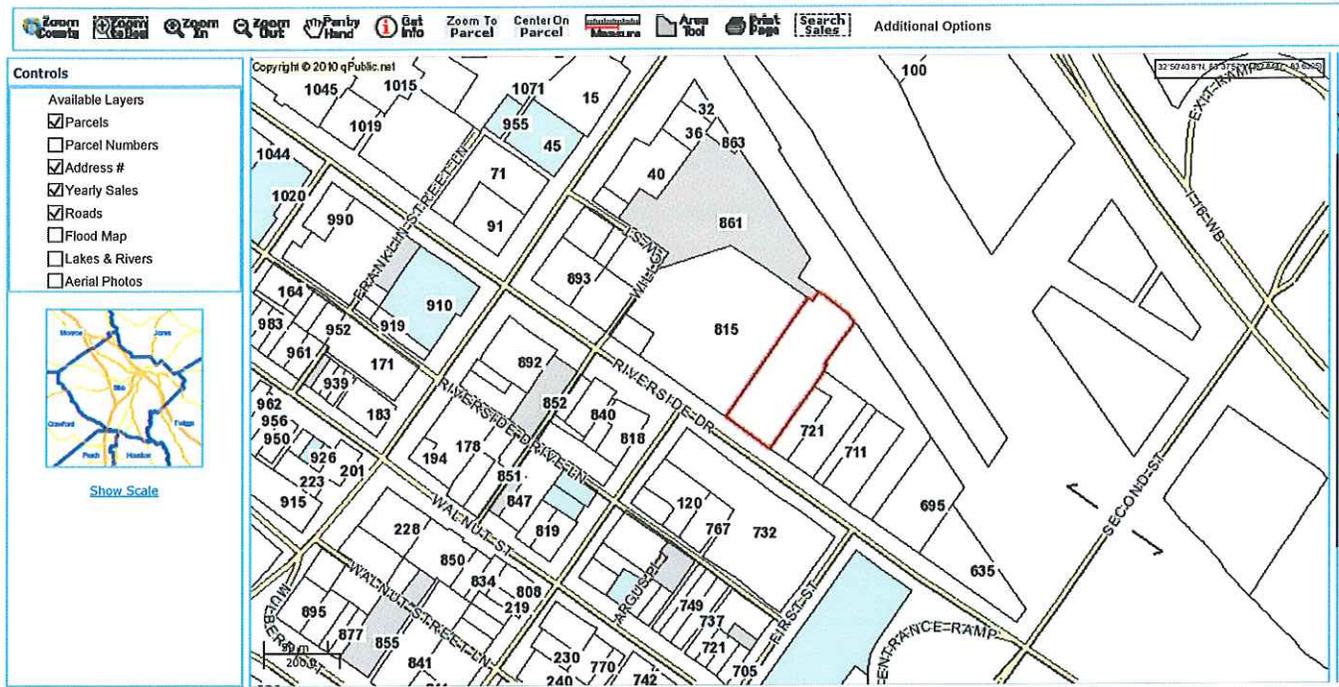
Signed, sealed and delivered in the presence of:

[Signature]  
[Signature]  
Notary Public  
My Commission Expires April 2, 1982



GEORGIA, Bibb County, Clerk's Office Superior Court  
Filed for Record APR 2 1981 8:30 AM  
Recorded APR 3 1981

\_\_\_\_\_  
Dep. Clerk  
[Signature]



Bibb County makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation. The assessment information is from the next certified taxroll.

# Macon/Bibb County

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### Owner and Parcel Information

Owner Name	MACON BIBB COUNTY URBAN DEV	Today's Date	May 20, 2015
Mailing Address	815 RIVERSIDE DR	Parcel Number	R073-0033
	MACON, GA 31201-2629	Tax District	08 (District 08)
Location Address	815 RIVERSIDE DR	2014 Millage Rate	08
Legal Description		Acres	1.63
Property Class(NOTE: Not Zoning Info)	E1-Exempt	Neighborhood	3100
Zoning	CBD-2	Homestead Exemption	No (S0)
Landlot/District	/	Parcel Map	<a href="#">Show Parcel Map</a>

### 2015 Tax Year Value Information

Land Value	Improvement Value	Accessory Value	Total Value	Previous Value
\$ 171,252	\$ 0	\$ 0	\$ 171,252	\$ 168,696

### Land Information

Type	Description	Calculation Method	Square Footage	Acres	Photo
RES	3106	Square Feet	71355	1.63	<a href="#">Show Photo</a>

### Improvement Information

No improvement information associated with this parcel.

### Accessory Information

Description	Year Built	Dimensions/Units	Value
No accessory information associated with this parcel.			

### Sale Information

Sale Date	Deed Book / Page	Plat Book / Page	Sale Price	Reason	Grantor	Grantee
03/30/1998	4142 344	54 75	400,000	\$ CONVERSION OF PAST SALES	BROWN JAMES L	MACON BIBB COUNTY URBAN DEV

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1998 MAR 30 PM 4 21

SUPERIOR COURT OF  
BIBB COUNTY, GEORGIA

WARRANTY DEED

EX/PAID RETURN TO  
SELL A NELTON, (LL)  
P.O. BOX 229  
MACON, GA 31207-2299

STATE OF GEORGIA,  
COUNTY OF BIBB.

THIS INDENTURE, made this 30th day of March in the year of our Lord One Thousand Nine Hundred and Ninety-eight between JAMES L. BROWN of the State of Georgia and County of Bibb, hereinafter called the "First Party," and MACON-BIBB COUNTY URBAN DEVELOPMENT AUTHORITY of the State of Georgia and County of Bibb, hereinafter called the "Second Party,"

WITNESSETH: That the First Party, for and in consideration of the sum of One Hundred Dollars (\$100.00) and other valuable considerations, cash in hand paid at and before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, does by these presents, grant, sell, convey and confirm unto the Second Party, all of the following described property, to-wit:

ALL THAT TRACT OR PARCEL OF LAND situate, lying and being in the City of Macon, Bibb County, Georgia, being known as all of Lot 3 and part of Lots 4, 5 and 6 in Square 99 of the Old City as more particularly shown on a plat recorded in Plat Book 54, Page 75, Clerk's Office, Bibb Superior Court and also an encroachment into Riverside Drive and a portion of alleys adjacent to said described lots. Said property is more particularly described as follows: BEGINNING at an iron pin at the southeasterly corner of Lot 6 in Square 99 where the same is intersected by the northwesterly side of a 10-foot alley and the northeasterly side of a 20-foot alley as shown on the original plats of the whole city, thence south 54 degrees 00 minutes east, a distance of 5.0 feet to the center line of a 10-foot alley; thence south 36 degrees 00 minutes west a distance of 267.3 feet to an iron pin on the northeasterly right of way of Riverside Drive as extended by an encroachment; thence north 54 degrees 57 minutes west along the northeasterly side of Riverside Drive a distance of 167.5 feet to a point, thence north 36 degrees 00 minutes east a distance of 427.6 feet to a point, thence south 54 degrees 00 minutes east a distance of 162.5 feet to an iron

SELL A NELTON, L.L.P.  
1400 Center Street (140)  
P.O. Box 229  
Macon, GA 31207-2299  
478-766-2421  
Fax 478-766-2422

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pin, thence south 36 degrees 00 minutes west a distance of 157.5 feet to an iron pin and the point of beginning.

LESS AND EXCEPT; All that tract or parcel of land situate, lying and being in Square 99 of Old City, Macon, Bibb County, Georgia, being more particularly described as follows: BEGINNING at a railroad iron located at a point where the northeasterly line of the original 20-foot alley through Square 98 intersects with the southeasterly line of the original 10-foot alley running through said Square 98; and from said beginning point running south 36 degrees 00 minutes west, a distance of 57.2 feet; thence angle left and run north 71 degrees 45 minutes 34 seconds east a distance of 215.48 feet, thence angle right and run south 54 degrees 00 minutes east a distance of 248.60 feet to the POINT OF BEGINNING, thence continue running south 54 degrees 00 minutes east a distance of 17.0 feet, thence angle right and run south 36 degrees 00 minutes west a distance of 387.32 feet, thence angle right and run north 54 degrees 57 minutes west a distance of 17.0 feet, thence angle right and run north 36 degrees 00 minutes east a distance of 387.60 feet to the POINT OF BEGINNING, all according to a plat recorded in Plat Book 74, page 38, Clerk's Office, Bibb Superior Court.

Said property is known as 725 Riverside Drive, Macon, GA. This is the same property described in a Warranty Deed dated November 25, 1996, from Empire Financial Services, Inc. to James L. Brown, recorded in Deed Book 2977, Page 76, Said Clerk's Office.

TO HAVE AND TO HOLD the said bargained premises, together with all and singular the rights, members and appurtenances thereto belonging or in any wise appertaining to every proper use, benefit and behoof of the Second Party, its heirs, executors, administrators and assigns in FEE SIMPLE;

And the First Party, its heirs, executors, and administrators, will warrant and forever defend the right and title to the above-described property unto the Second Party, its heirs, executors, administrators and assigns, against the lawful claims and demands of all persons whomsoever.

TELL AMERICA, L.L.P.  
1430 Capital Square (4th)  
P.O. Box 770  
Macon, GA 31201-0770  
919-754-4331  
FAX 919-754-4328

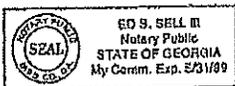
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IN WITNESS WHEREOF, the First Party has signed, sealed and delivered these presents, the day and year first above written.

*[Signature]*  
JAMES L. BROWN (SEAL)

Signed, sealed and delivered in the presence of:  
*[Signature]*  
*[Signature]*  
(UNOFFICIAL WITNESSES)  
NOTARY PUBLIC.

My commission expires: \_\_\_\_\_  
(AFFIX NOTARY SEAL HERE)



GEORGIA, 323 County, Clerk's Office Superior Court  
Filed for Record MAR 30 1998 4:12 P M  
Recorded MAR 31 1998  
Dep. Clerk

SELL & MELTON, L.L.P.  
1400 Cherokee Medical Center  
P.O. Box 227  
Macon, GA 31202-0227  
Tel: 774-5521  
Fax: 774-5420

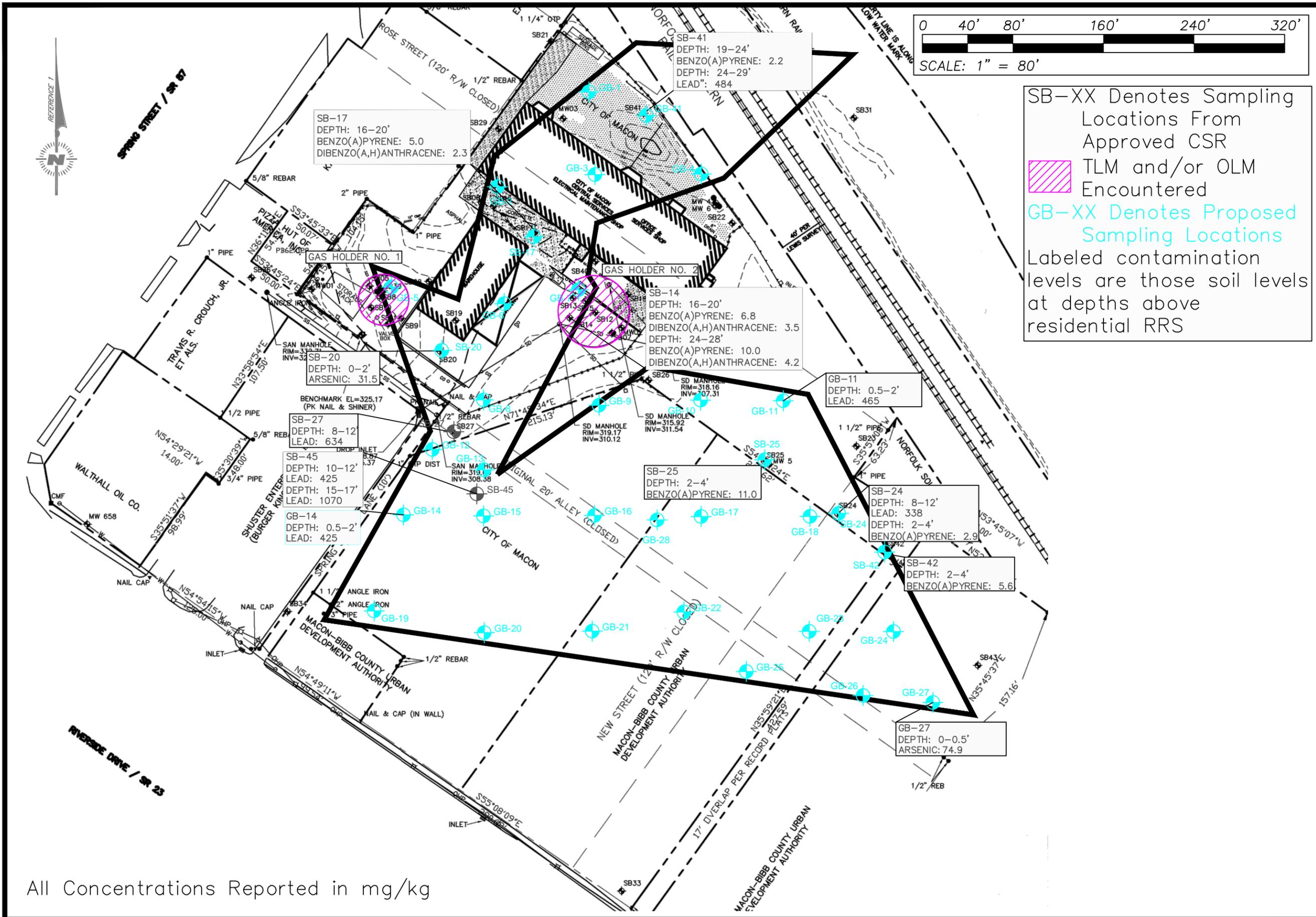
# APPENDIX C



**Figure 1**  
**Site Location Map**  
**Former Macon 2 MGP Facility**  
**Macon, Bibb County, Georgia**  
**GEC Project No. 130659.241**  
**Approximate Scale: 1" = 2,000'**  
**Source: Macon West, GA Quadrangle (1985)**

**GEC**  
**GEOTECHNICAL**  
**&**  
**ENVIRONMENTAL**  
**CONSULTANTS, INC**

514 Hillcrest Industrial Boulevard, Macon, GA 31204 • Phone: (478) 757-1606 • Fax: (478) 757-1608  
 5031 Milgen Court, Columbus, GA 31907 • Phone: (706) 569-0008 • Fax: (706) 569-0940



All Concentrations Reported in mg/kg

514 HILLCREST INDUSTRIAL BLVD.  
 MACON, GEORGIA 31204  
 478-757-1606 (Fax) 478-757-1608  
 WWW.GECONSULTANTS.COM

**GEC**  
 GEOTECHNICAL  
 &  
 ENVIRONMENTAL  
 CONSULTANTS, INC.

**FIGURE 2: GEC PROPOSED SOIL SAMPLING LOCATION PLAN**  
**FORMER MACON 2 MPG SITE**  
**MACON, GEORGIA**  
 GEC PROJECT NO. 130659.241

## Key of Abbreviations, Data Flags and Method Flags

### Abbreviations

UBL - Upper Background Limit

DL - Detection Limit

U - Unsaturated

S - Saturated

Shaded cells indicate COI exceeds UBL

### Data Flags

#### Organics

U - Indicates parameter was analyzed for but not detected at or above the reported Quantitation Limit

J - Indicates an estimated value

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor

#### Inorganics

U - Indicates parameter was analyzed for but not detected

J - Indicates an estimated value

B - The reported value was obtained from a reading less than the Contract Required Detection Limit but greater than or equal to the Instrument Detection Limit

E - This reported value is estimated because of the presence of interference

N - Spiked sample recovery not within control limits

W - Post-digestion spike for Furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance

\* - Duplicate analysis not within control limits

### Method Flags

P - ICP

F - Graphite Furnace

CV - Cold Vapor Mercury

C - Cyanide

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**VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-SITE INSPECTION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

		Saturated/Unsaturated	Unit	Benzene	Carbon Disulfide	Ethylbenzene	Methylene Chloride	Toluene	Xylenes	Total Detected VOCs
UBL - Fill Material				DL	DL	DL	DL	DL	DL	--
UBL - Natural Soils				DL	DL	DL	DL	DL	DL	--
SB-1A-20-22	S	Nat. Soils	6UJ		6UJ	6UJ	6UJ	6UJ	6UJ	37
SB-1B-6-8	U	Nat. Soils	6UJ	6UJ	6UJ	6UJ	6UJ	6UJ	6UJ	0
SB-2A-18-20	U	Fill	6UJ		1J	6UJ	6UJ	6UJ	5J	32
SB-2B-22-24	S	Fill	6UJ		6UJ	6UJ	6UJ	6UJ	6UJ	7
SB-2C-26-28	S	Nat. Soils	7U		7U	7UJ	7U	7U	7J	52
SB-3A-20-22	U	Fill	6UJ		6UJ				6UJ	58
SB-3B-22-24	S	Fill	6UJ	4J	6UJ	6UJ	6UJ	4J	6UJ	0
SB-4A-10-12	U	Fill	6U	5J	6U				6U	75
SB-4B-24-26	S	Fill	6UJ	6U	6UJ	6UJ	6UJ	6U	6UJ	8
SB-4C-21.5-23.5	U	Fill	1J	2J	5UJ	0.035J	2J	5UJ	5UJ	0
SB-5A-8-10	U	Fill	6UJ	6U	6UJ	6UJ	6UJ	6UJ	6UJ	0
SB-6A-6-8	U	Fill	6UJ		6U	6UJ	6U	6U	3J	10
SB-6B-12-14	U	Fill	1J	5J	6U	6UJ	6UJ	4J	4J	0
SB-7A-6-7	U	Fill	6U	6U	6U	6UJ	6U	6U	6U	0

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**INORGANIC COMPOUNDS**  
**SOIL SAMPLES-SITE INSPECTION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER KILOGRAMS (mg/kg)**

	Saturated/ Unsaturated	Unit	INORGANIC COMPOUNDS											
			Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Vanadium	T-Cyanide
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	257	58.9	DL
UBL - Natural Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	80.3	120	DL
SB-1A-20-22	S	Nat. Soils	0.87UJ	87.3N*J	0.81BP	0.42BE	2.2BP	5.0BJP	9.0N*J	0.12U	2.6BP	14.7UJ	3.4BJP	
SB-1B-6-8	U	Nat. Soils	2.40NW	2.0BN*	0.55U	0.39UJ	23.4P	4.1BJP	3.40N*	0.11U	9.8P	17.7U	2.6BJP	
SB-2A-18-20	U	Fill	2.7ENJ	40.7BN*	0.64BP	0.42UJ	14.5P	15.8JP	13.0N*J	0.12U	5.4BP	38.4U	28.6JP	
SB-2B-22-24	S	Fill	2.2BNJ	45.7BN*	0.64U	0.46UJ	9.9P	15.9JP	57.7N*J	0.13U	11.4P	50.7U	17.5JP	
SB-2C-26-28	S	Nat. Soils	0.95UJ	97.2N*J	0.64U	0.46UJ	27.5P	18.1JP	24.2N*J	0.13U	11.0P	72U	46.8JP	
SB-3A-20-22	U	Fill	1.8BENJ	70.8N*J	0.74BP	0.43UJ	11.9P	13.3JP		0.38EN	4.0BP	84.9U	18.8JP	
SB-3B-22-24	S	Fill	1.6BNW		0.71BP	0.41UJ	10.7P	17.6JP	171N*JF		5.0BP	189EJP	22.3JP	
SB-4A-10-12	U	Fill	3.2ENJ	86.7N*J	0.61BP	0.4UJ	9.4P	30.4JP	131N*JF		5.2BP	103UJ	16.2JP	
SB-4C-21.5-23.5	U	Fill	2.7NJF	38.9BN*	0.61BP	0.4UJ	10.1P	15.0JP	61.9N*J	0.27EN	5.8BP	55.6U	14.6JP	
SB-5A-8-10	U	Fill	2.2BEN	37.5BN*	0.70BP	0.41UJ	12.8P	36.2JP	46.6N*J	0.17EN	5.8BP	53U	23.4JP	
SB-6A-6-8	U	Fill	2.5NJF	20.8BN*	0.79BP	0.41UJ	10.1P	0.46UJ	27.9N*J	0.11U	4.3BP	47.1U	41.0JP	
SB-6B-12-14	U	Fill	1.6BNJ	24.7BN*	0.78BP	0.41UJ	6.1P	5.1BJP	54.6N*J	0.28NC	2.4BP	45.8U	11.6JP	
SB-7A-6-7	U	Fill	3.7ENJ	76.0N*J	0.61BP	0.4UJ	10.3P	17.1JP	192N*JF	0.45NC	5.1BP	91.7UJ	19.1JP	

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**VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

		Saturated/Unsaturated	Unit	Benzene	Carbon Disulfide	Ethylbenzene	Methylene Chloride	Toluene	Xylenes	Total Detected VOCs
UBL - Fill Material				DL	DL	DL	DL	DL	DL	--
UBL - Nat. Soils				DL	DL	DL	DL	DL	DL	--
SB-14-0.5-2	U	Fill		5.8U	5.8U	5.8U	23U	5.8U	5.8U	0
SB-14-16-20	U	Fill		5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
SB-14-24-28	S	Fill		9.3	8.2U	8.2U	33U	8.2U	8.2U	9.3
SB-15-4-8	U	Fill		4.2U	4.2U	4.2U	17U	4.2U	4.2U	0
SB-15-36-41	S	Fill		5.1U	17	5.1U	20U	5.1U	5.1U	17
SB-16-0.5-2	U	Fill		6U	6U	6U	24U	6U	6U	0
SB-16-2-4	U	Fill		4.9U	4.9U	4.9U	20U	4.9U	4.9U	0
SB-16-19-24	U	Fill		4.9U	4.9U	4.9U	20U	4.9U	4.9U	0
SB-16-24-29	S	Fill		6.6U	14	6.6U	26U	6.6U	6.6U	14
SB-16-29-34	S	Nat. Soil		7U	7U	7U	28U	7U	7U	0
SB-16-34-37	S	Nat. Soil		5.6U	5.6U	5.6U	22U	5.6U	5.6U	0
SB-17-0.5-2	U	Fill		6.1U	6.1U	6.1U	24U	6.1U	6.1U	0
SB-17-2-4	U	Fill		4.4U	4.4U	4.4U	18U	4.4U	4.4U	0
SB-17-16-20	U	Fill		5U	5.3	5U	20U	5U	5U	5.3
SB-17-24-28	S	Fill		5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
SB-17-29-33	S	Fill		13	6.3U	6.3U	25U	6.3U	6.3U	13
SB-17-44-49	S	Nat. Soil		5100	6.9U	23	28U	150	61	5300
SB-17-49-51	S	Nat. Soil		10	5U	5U	20U	5U	5U	10
SB-17-54-59	S	Nat. Soil		15	4.9U	4.9U	20U	4.9U	4.9U	15
SB-18-0.5-2	U	Fill		5.6U	5.6U	5.6U	22U	5.6U	5.6U	0
SB-18-2-4	U	Fill		5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
SB-18-16-18	U	Fill		5.2U	5.2U	5.2U	21U	5.2U	5.2U	0
SB-18-28-32	S	Fill		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-18-32-36	S	Nat. Soil		94	5.7U	15	23U	976	37	160
SB-18-56-60	S	Nat. Soil		6.5U	6.5U	6.5U	26U	6.5U	6.5U	0
SB-19-0.5-2	U	Fill		4.4U	4.4U	4.4U	18U	4.4U	4.4U	0
SB-19-2-4	U	Fill		5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
DUP032101A	U	Fill		4.8U	4.8U	4.8U	19U	4.8U	4.8U	0
SB-19-4-8	U	Fill		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-19-8-11	U	Nat. Soil		5.2U	5.2U	5.2U	21U	5.2U	5.2U	0
SB-20-0-2	U	Fill		5.8U	5.8U	5.8U	23U	5.8U	5.8U	0
DUP031501B	U	Fill		5.3U	5.3U	5.3U	21U	5.3U	5.3U	0
SB-20-2-4	U	Fill		4.3U	4.3U	4.3U	17U	4.3U	4.3U	0
SB-20-4-8	U	Fill		4.8U	4.8U	4.8U	19U	4.8U	4.8U	0
SB-20-9-13	U	Nat. Soil		5.5U	5.5U	5.5U	22U	5.5U	5.5U	0
SB-21-0-2	U	Fill		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
DUP030601A	U	Fill		4.8U	4.8U	4.8U	19U	4.8U	4.8U	0
SB-21-2-4	U	Fill		7.1U	7.1U	7.1U	29U	7.1U	7.1U	0
SB-21-12-16	U	Fill		4.9U	4.9U	4.9U	20U	6.7	4.9U	6.7
SB-21-16-20	U	Fill		5.4U	5.4U	5.4U	22U	5.4U	5.4U	0
SB-21-28-30	S	Fill		5.3U	10	5.3U	21U	5.3U	5.3U	10
SB-21-44-48	S	Nat. Soil		5U	5U	5U	20U	5U	5U	0
SB-21-60-64	S	Nat. Soil		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-22-0-2	U	Fill		4.8U	4.8U	4.8U	19U	4.8U	4.8U	0

**VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

			Saturated/Unsaturated	Unit	Benzene	Carbon Disulfide	Ethylbenzene	Methylene Chloride	Toluene	Xylenes	Total Detected VOCs
UBL - Fill Material					DL	DL	DL	DL	DL	DL	--
UBL - Nat. Soils					DL	DL	DL	DL	DL	DL	--
SB-22-2-4	U	Fill			3.6U	3.6U	3.6U	15U	3.6U	3.6U	0
SB-22-19-24	U	Fill			3.8U	3.8U	3.8U	15U	3.8U	3.8U	0
SB-22-24-29	S	Nat. Soil			4.5U	4.5U	4.5U	18U	4.5U	4.5U	0
SB-22-59-62	S	Nat. Soil			5.1U	5.1U	5.1U	21U	5.1U	5.1U	0
SB-23-0-2	U	Fill			5.6U	5.6U	5.6U	22U	5.6U	5.6U	0
DUP032201B	U	Fill			5.5U	5.5U	5.5U	22U	5.5U	5.5U	0
SB-23-2-4	U	Fill			3.8U	3.8U	3.8U	15U	3.8U	3.8U	0
SB-23-14-19	U	Fill			5.2U	5.2U	5.2U	21U	5.2U	5.2U	0
SB-23-24-29	S	Fill			5.9U	5.9U	5.9U	23U	5.9U	5.9U	0
SB-23-59-62	S	Nat. Soil			6.2U	6.2U	6.2U	25U	6.2U	6.2U	0
SB-24-0-2	U	Fill			4.1U	4.1U	4.1U	16U	4.1U	4.1U	0
SB-24-2-4	U	Fill			3.5U	3.5U	3.5U	14U	3.5U	3.5U	0
SB-24-8-12	U	Fill			4.8U	5.4	4.8U	19U	4.8U	4.8U	5.4
SB-24-32-34	S	Fill			5.4U	18	5.4U	22U	5.4U	5.4U	18
SB-24-40-42	S	Nat. Soil			5.6U	5.6U	5.6U	22U	5.6U	5.6U	0
SB-24-44-48	S	Nat. Soil			5.3U	5.3U	5.3U	21U	5.3U	5.3U	0
DUP030101A	S	Nat. Soil			4.5U	4.5U	4.5U	18U	4.5U	4.5U	0
SB-24-52-56	S	Nat. Soil			4.9U	4.9U	4.9U	19U	4.9U	4.9U	0
SB-25-0.5-2	U	Fill			4.4U	4.4U	4.4U	18U	4.4U	4.4U	0
SB-25-2-4	U	Fill			4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-25-16-20	U	Fill			3.7U	3.7U	3.7U	15U	3.7U	3.7U	0
SB-25-28-32	S	Fill			5U	5U	5U	20U	5U	5U	0
SB-25-44-48	S	Nat. Soil			5.1U	5.1U	5.1U	21U	5.1U	5.1U	0
SB-25-56-60	S	Nat. Soil			4.4U	4.4U	4.4U	17U	4.4U	4.4U	0
SB-25-60-61	S	Nat. Soil			6U	6U	6U	24U	6U	6U	0
SB-26-0.5-2	U	Fill			4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-26-2-4	U	Fill			4.1U	4.1U	4.1U	16U	4.1U	4.1U	0
SB-26-8-12	U	Fill			5U	5U	5U	20U	5U	5U	0
DUP030201A	U	Fill			3.9U	3.9U	3.9U	16U	3.9U	3.9U	0
SB-26-20-24	U	Fill			3.5U	3.5U	3.5U	14U	3.5U	3.5U	0
SB-26-32-36	S	Fill			5.2U	5.2U	5.2U	21U	5.2U	5.2U	0
SB-26-48-51	S	Nat. Soil			6.8U	6.8U	6.8U	27U	6.8U	6.8U	0
SB-26-51-52	S	Nat. Soil			5.9U	5.9U	5.9U	24U	5.9U	5.9U	0
SB-27-0.5-1.5	U	Fill			5.4U	5.4U	5.4U	21U	5.4U	5.4U	0
SB-27-2-4	U	Fill			4.5U	4.5U	4.5U	18U	4.5U	4.5U	0
SB-27-8-12	U	Fill			3.1	5.4U	5.4U	22U	6.8	5.5	43
SB-27-16-20	U	Nat. Soil			4.8U	4.8U	4.8U	19U	4.8U	4.8U	0
SB-27-20-21	S	Nat. Soil			4.9U	4.9U	4.9U	19U	4.9U	4.9U	0
SB-28-0.5-2	U	Fill			5.4U	5.4U	5.4U	21U	5.4U	5.4U	0
SB-28-2-4	U	Fill			4.5U	4.5U	4.5U	18U	4.5U	4.5U	0
SB-28-4-8	U	Fill			4.8U	5.7	4.8U	19U	4.8U	4.8U	5.7
SB-28-8-9.5	U	Nat. Soil			5.3U	5.3U	5.3U	21U	5.3U	5.3U	0
SB-29-0.5-2	U	Fill			5U	5U	5U	20U	5U	5U	0
DUP030501A	U	Fill			5U	5U	5U	20U	5U	5U	0

**VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

		Saturated/Unsaturated	Unit	Benzene	Carbon Disulfide	Ethylbenzene	Methylene Chloride	Toluene	Xylenes	Total Detected VOCs
UBL - Fill Material				DL	DL	DL	DL	DL	DL	-
UBL - Nat. Soils				DL	DL	DL	DL	DL	DL	-
SB-29-2-4	U	Fill		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-29-20-24	U	Fill		3.5U	3.5U	3.5U	14U	3.5U	3.5U	0
SB-29-28-32	S	Fill		4.8U	4.8U	4.8U	19U	4.8U	4.8U	0
SB-29-48-62	S	Nat. Soil		7U	7U	7U	28U	7U	7U	0
SB-29-52-53	S	Nat. Soil		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-30-0-2	U	Nat. Soil		5.8U	5.8U	5.8U	23U	5.8U	5.8U	0
DUP041201A	U	Nat. Soil		6.1U	6.1U	6.1U	24U	6.1U	6.1U	0
SB-30-2-4	U	Nat. Soil		6.9U	6.9U	6.9U	28U	6.9U	6.9U	0
SB-30-8-12	S	Nat. Soil		6.8U	6.8U	6.8U	27U	6.8U	6.8U	0
SB-30-16-20	S	Nat. Soil		5.5U	5.5U	5.5U	22U	5.5U	5.5U	0
SB-31-0-2	U	Nat. Soil		6.9U	6.9U	6.9U	28U	6.9U	6.9U	0
SB-31-2-4	U	Nat. Soil		7U	7U	7U	28U	7U	7U	0
SB-31-4-8	U	Nat. Soil		6.3U	6.3U	6.3U	25U	6.3U	6.3U	0
SB-31-8-12	U	Nat. Soil		6.7U	6.7U	6.7U	27U	6.7U	6.7U	0
SB-31-16-20	S	Nat. Soil		6.4U	6.4U	6.4U	26U	6.4U	6.4U	0
SB-32-0-2	U	Nat. Soil		7.3U	7.3U	7.3U	29U	7.3U	7.3U	0
SB-32-2-4	U	Nat. Soil		5.8U	5.8U	5.8U	23U	5.8U	5.8U	0
SB-32-4-8	U	Nat. Soil		6.4U	6.4U	6.4U	26U	6.4U	6.4U	0
SB-32-16-20	S	Nat. Soil		6U	6U	6U	24U	6U	6U	0
SB-33-0.5-2	U	Fill		4.2U	4.2U	4.2U	17U	4.2U	4.2U	0
SB-33-2-4	U	Fill		4.6U	4.6U	4.6U	19U	4.6U	4.6U	0
SB-33-8-10	U	Fill		5.3U	5.3U	5.3U	21U	5.3U	5.3U	0
SB-33-10-14	U	Nat. Soil		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-34-0.5-2	U	Fill		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-34-2-4	U	Fill		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-34-4-8	U	Fill		5.7	4.1U	4.1U	17U	4.1U	4.1U	5.7
SB-34-8-10	U	Nat. Soil		7.3U	7.3U	7.3U	29U	7.3U	7.3U	0
SB-36-0.5-2	U	Fill		5.4U	5.4U	5.4U	21U	5.4U	5.4U	0
SB-36-2-4	U	Fill		6.6U	6.6U	6.6U	26U	6.6U	6.6U	0
SB-36-4-6	U	Nat. Soil		8.5U	8.5U	8.5U	34U	8.5U	8.5U	0
SB-38-0-2	U	Fill		5.7U	5.7U	5.7U	23U	5.7U	5.7U	0
DUP041201B	U	Fill		5.6U	5.6U	5.6U	23U	5.6U	5.6U	0
SB-38-2-4	U	Fill		5.5U	5.5U	5.5U	22U	5.5U	5.5U	0
SB-38-4-6.5	U	Fill		6.1U	6.1U	6.1U	24U	6.1U	6.1U	0
SB-38-14-19	S	Nat. Soil		6.6U	6.6U	6.6U	26U	6.6U	6.6U	0
SB-38-34-38	S	Nat. Soil		62	6.8U	6.8U	27U	6.8U	6.8U	62
SB-39-0.5-2	U	Fill		6.1U	6.1U	6.1U	24U	6.1U	6.1U	0
SB-39-4-8	U	Fill		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-39-8-12.5	U	Fill		4.5U	4.5U	4.5U	18U	4.5U	4.5U	0
SB-40-0.5-2	U	Fill		6U	6U	6U	24U	6U	6U	0
SB-40-2-4	U	Fill		5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
SB-40-16-20	U	Fill		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-40-24-28	S	Fill		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-40-40-44	S	Nat. Soil		33	4.5U	4.5U	18U	4.5U	4.5U	33

**VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

			Saturated/Unsaturated	Unit	Benzene	Carbon Disulfide	Ethylbenzene	Methylene Chloride	Toluene	Xylenes	Total Detected VOCs
UBL - Fill Material					DL	DL	DL	DL	DL	DL	--
UBL - Nat. Soils					DL	DL	DL	DL	DL	DL	--
DUP032001A	S	Nat. Soil			64	6.1U	6.1U	24U	6.1U	6.1U	64
SB-40-56-58	S	Nat. Soil			4.9U	4.9U	4.9U	20U	4.9U	4.9U	0
SB-41-0-2	U	Fill			7.9U	7.9U	7.9U	32U	7.9U	7.9U	0
SB-41-2-4	U	Fill			5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
SB-41-19-24	U	Fill			4.5U	12	4.5U	18U	4.5U	4.5U	12
SB-41-24-29	S	Fill			8.3U	15	8.3U	33U	8.3U	8.3U	15
SB-41-54-59	S	Nat. Soil			4.9U	4.9U	4.9U	20U	4.9U	4.9U	0
MW-6-34-39	S	Nat. Soil			6.1U	6.1U	6.1U	25U	6.1U	6.1U	0
MW-6-44-49	S	Nat. Soil			6.3U	6.3U	6.3U	25U	6.3U	6.3U	0
DUP032701A	S	Nat. Soil			5.6U	5.6U	5.6U	22U	5.6U	5.6U	0
GH-2-41	S	Fill			7.5U	7.5U	7.5U	30U	7.5U	7.5U	0

**SEMI-VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

			Saturated/Unsaturated	Unit	Acenaphthene	Acenaphthylene	Anthracene	Benzofluoranthene	Benzofluoranthene	Benzofluoranthene	Benzofluoranthene	Chrysene	Dibenzofluoranthene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Phenol	Pyrene	Total Detected SVOCs Exceeding Background	Total Detected SVOCs	
			DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	--	--	
UBL - Fill Material			DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	--	--
UBL - Nat. Soils			DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	--	--
SB-14-0.5-2	U	Fill	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	0	0
SB-14-16-20	U	Fill	2,200	370U	3,700	6,600	6,800	5,600	5,000	5,800	6,000	3,500	14,000	2,300	6,100	2,100	13,000	370U	7,100	11,000	94,000	94,000	
SB-14-24-28	S	Fill	2,100	400U	4,900	8,900	10,000	8,900	8,500	8,300	9,600	4,200	20,000	2,700	7,100	1,800	15,000	400U	15,000	130,000	130,000		
SB-15-4-8	U	Fill	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0
SB-15-36-41	S	Fill	380U	380U	560	1,100	1,200	1,100	1,000	720	1,100	390	2,600	380U	870	380U	2,100	380U	2,300	15,000	15,000		
SB-16-0.5-2	U	Fill	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	0	0
SB-16-2-4	U	Fill	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	0	0
SB-16-19-24	U	Fill	380U	380U	380U	670	740	830	380U	700	680	380U	1,500	380U	380U	380U	380U	1,000	380U	980	6,200	6,900	
SB-16-24-29	S	Fill	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0
SB-16-29-34	S	Nat. Soil	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	0	0
SB-16-34-37	S	Nat. Soil	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0
SB-17-0.5-2	U	Fill	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0
SB-17-2-4	U	Fill	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0
SB-17-16-20	U	Fill	1,500	400U	2,600	5,300	6,000	4,500	4,900	3,900	5,100	2,300	11,000	1,300	4,700	400U	7,500	400U	7,400	67,000	67,000		
SB-17-24-28	S	Fill	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
SB-17-29-33	S	Fill	420U	450	420U	870	910	880	1,300	940	900	420U	3,000	420U	840	420U	2,600	420U	3,900	16,000	16,000		
SB-17-44-49	S	Nat. Soil	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	0	0
SB-17-49-51	S	Nat. Soil	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
SB-17-54-59	S	Nat. Soil	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
SB-18-0.5-2	U	Fill	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	0	0
SB-18-2-4	U	Fill	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	0	0
SB-18-16-18	U	Fill	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	0	0
SB-18-28-32	S	Fill	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	0	0
SB-18-32-36	S	Nat. Soil	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	0	0
SB-18-56-60	S	Nat. Soil	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	0	0
SB-19-0.5-2	U	Fill	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0
SB-19-2-4	U	Fill	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	0	0

**SEMI-VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

			Saturated/Unsaturated	Unit	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Phenol	Pyrene	Total Detected SVOCs Exceeding Background	Total Detected SVOCs	
UBL - Fill Material			DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	
UBL - Nat. Soils			DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	
DUP032101A	U	Fill	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	0	0
SB-19-4-8	U	Fill	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	0	0
SB-19-8-11	U	Nat. Soil	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0
SB-20-0-2	U	Fill	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	0	0
DUP031501B	U	Fill	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
SB-20-2-4	U	Fill	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0
SB-20-4-8	U	Fill	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0
SB-20-9-13	U	Nat. Soil	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	0	0
SB-21-0-2	U	Fill	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
DUP030601A	U	Fill	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0
SB-21-2-4	U	Fill	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0
SB-21-12-16	U	Fill	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0
SB-21-16-20	U	Fill	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	0	0
SB-21-28-30	S	Fill	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
SB-21-44-48	S	Nat. Soil	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0
SB-21-60-64	S	Nat. Soil	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	0	0
SB-22-0-2	U	Fill	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
SB-22-2-4	U	Fill	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0
SB-22-19-24	U	Fill	420	370U	800	1,400	1,400	1,300	980	1,000	1,400	470	9,000	730	850	2,800	2,800	370U	2,300	21,000	21,000	0	0	
SB-22-24-29	S	Nat. Soil	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0
SB-22-59-62	S	Nat. Soil	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	0	0
SB-23-0-2	U	Fill	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	0	0
DUP032201B	U	Fill	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	0	0
SB-23-2-4	U	Fill	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0
SB-23-14-19	U	Fill	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	510	360U	360U	360U	360U	360U	360U	410	0	920
SB-23-24-29	S	Fill	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0
SB-23-59-62	S	Nat. Soil	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	0	0

**SEMI-VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

			Saturated/Unsaturated	Unit	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Phenol	Pyrene	Total Detected SVOCs Exceeding Background	Total Detected SVOCs	
UBL - Fill Material					DL	DL	DL	560	690	610	690	570	680	DL	1,200	DL	580	DL	560	DL	920	-	-	
UBL - Nat. Soils					DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	-	-	
SB-24-0-2	U	Fill	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0
SB-24-2-4	U	Fill	370U	370U	1,100	2,500	2,900	3,200	730	2,100	2,500	370U	6,800	420	690	370U	3,700	370U	4,400	30,000	30,000	30,000	30,000	
SB-24-8-12	U	Fill	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	410	380U	380U	380U	380U	380U	380U	380U	380U	380U	0	410
SB-24-32-34	S	Fill	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	0	0
SB-24-40-42	S	Nat. Soil	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
SB-24-44-48	S	Nat. Soil	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0
DUP030101A	S	Nat. Soil	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0
SB-24-52-58	S	Nat. Soil	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0
SB-25-0.5-2	U	Fill	370U	370U	370U	750	740	690	370U	780	770	370U	1,500	370U	370U	370U	370U	1,100	370U	1,100	7,400	7,400	7,400	
SB-25-2-4	U	Fill	800	360U	2,000	8,300	11,000	12,000	2,500	12,000	9,100	650	17,000	870	2,600	760	8,600	360U	13,000	100,000	100,000	100,000	100,000	
SB-25-16-20	U	Fill	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	0	0
SB-25-28-32	S	Fill	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	480U	0	0
SB-25-44-48	S	Nat. Soil	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	0	0
SB-25-56-60	S	Nat. Soil	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	0	0
SB-25-60-61	S	Nat. Soil	470U	470U	470U	470U	470U	470U	470U	470U	470U	470U	470U	470U	470U	470U	470U	470U	470U	470U	470U	470U	0	0
SB-26-0.5-2	U	Fill	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	0	0
SB-26-2-4	U	Fill	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	0	0
SB-26-8-12	U	Fill	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	0	0
DUP030201A	U	Fill	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	370U	0	0
SB-26-20-24	U	Fill	370U	370U	370U	580	610	500	380	810	690	370U	1,400	370U	370	370U	1,200	370U	1,200	5,700	7,500	7,500	7,500	
SB-26-32-36	S	Fill	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0
SB-26-48-51	S	Nat. Soil	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
SB-26-51-52	S	Nat. Soil	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	0	0
SB-27-0.5-1.5	U	Fill	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
SB-27-2-4	U	Fill	370U	370U	370U	450	540	430	370U	500	460	370U	960	370U	370U	370U	720	370U	720	720	4,800	4,800		
SB-27-8-12	U	Fill	460U	460U	480	930	1,100	1,000	460U	930	1,000	460U	2,000	460U	460U	460U	2,000	460U	1,900	11,000	11,000	11,000		
SB-27-16-20	U	Nat. Soil	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0	

**SEMI-VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

		Saturated/Unsaturated	Unit	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Phenol	Pyrene	Total Detected SVOCs Exceeding Background	Total Detected SVOCs	
UBL - Fill Material				DL	DL	DL	560	690	610	690	570	680	DL	1,200	DL	580	DL	560	DL	920	--	--	
UBL - Nat. Soils				DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	--	--	
SB-27-20-21	S	Nat. Soil		380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	0	0
SB-28-0.5-2	U	Fill		410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0
SB-28-2-4	U	Fill		390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0
SB-28-4-8	U	Fill		410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0
SB-28-8-9.5	U	Nat. Soil		360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0
SB-29-0.5-2	U	Fill		430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0
DUP030501A	U	Surface		420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	0	0
SB-29-2-4	U	Fill		400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
SB-29-20-24	U	Fill		390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0
SB-29-28-32	S	Fill		410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0
SB-29-48-52	S	Nat. Soil		490U	490U	490U	490U	520	490U	490U	490U	490U	490U	490U	490U	490U	490U	490U	490U	490U	490U	0	520
SB-29-52-53	S	Nat. Soil		390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0
SB-30-0-2	U	Nat. Soil		340U	340U	340U	340U	340U	340U	340U	340U	340U	340U	340U	340U	340U	340U	340U	340U	340U	340U	0	0
DUP041201A	U	Nat. Soil		350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	0	0
SB-30-2-4	U	Nat. Soil		360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0
SB-30-8-12	S	Nat. Soil		430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0
SB-30-16-20	S	Nat. Soil		420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	0	0
SB-31-0-2	U	Nat. Soil		410U	410U	410U	410U	410U	410U	410U	410U	410U	410	410U	410U	410U	410U	410U	410U	410U	410U	0	410
SB-31-2-4	U	Nat. Soil		410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0
SB-31-4-8	U	Nat. Soil		430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0
SB-31-8-12	U	Nat. Soil		440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	0	0
SB-31-16-20	S	Nat. Soil		430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0
SB-32-0-2	U	Nat. Soil		400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0
SB-32-2-4	U	Nat. Soil		430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0
SB-32-4-8	U	Nat. Soil		410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0
SB-32-16-20	S	Nat. Soil		420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	420U	0	0
SB-33-0.5-2	U	Fill		360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0

**SEMI-VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

		Saturated/Unsaturated		Unit	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Phenol	Pyrene	Total Detected SVOCs Exceeding Background	Total Detected SVOCs	
		DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	-	-	
UBL - Fill Material																								
UBL - Nat. Solis																								
SB-33-2-4	U Fill	370U	420	370U	2,300	9,200	2,500	1,300	2,200	2,800	520	3,200	370U	1,300	370U	1,300	370U	3,200	370U	3,200	24,000	24,000		
SB-33-8-10	U Fill	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0	
SB-33-10-14	U Nat. Soil	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0	
SB-33B-2-4	U Fill	370U	370U	370U	490	690	540	690	430	540	370U	970	370U	580	370U	530	370U	850	370U	850	0	6,310		
SB-34-0.5-2	U Fill	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	0	0	
SB-34-2-4	U Fill	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	610	360U	360U	360U	360U	360U	360U	360U	530	0	1,100
SB-34-4-8	U Fill	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0	
SB-34-8-10	U Nat. Soil	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	0	0	
SB-36-0.5-2	U Fill	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	350U	0	0	
SB-36-2-4	U Fill	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	0	0	
SB-36-4-6	U Nat. Soil	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	0	0	
SB-38-0-2	U Fill	370U	370U	370U	470	450	590	540	370U	490	370U	1,000	370U	380	370U	480	370U	920	370U	920	0	5,300		
DUP041201B	U Fill	370U	370U	370U	370U	420	420	440	370U	370	370U	870	370U	370U	370U	670	370U	670	370U	670	670	670	3,900	
SB-38-2-4	U Fill	370U	370U	370U	560	590	610	370U	570	680	370U	1,200	370U	370U	370U	560	370U	900	370U	900	0	5,700		
SB-38-4-6.5	U Fill	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	400U	0	0	
SB-38-14-19	S Nat. Soil	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0	
SB-38-34-38	S Nat. Soil	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	0	0	
SB-39-0.5-2	U Fill	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0	
SB-39-4-8	U Fill	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	380U	0	0	
SB-39-8-12.5	U Fill	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0	
SB-40-0.5-2	U Fill	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	410U	0	0	
SB-40-2-4	U Fill	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0	
SB-40-16-20	U Fill	360U	360U	360U	540	550	380	360U	510	570	360U	1,300	360U	360U	360U	960	360U	760	360U	760	2,300	5,600		
SB-40-24-28	S Fill	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0	
SB-40-40-44	S Nat. Soil	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	450U	0	0	
DUP032001A	S Nat. Soil	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0	
SB-40-56-58	S Nat. Soil	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0	

**SEMI-VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

Saturated/Unsaturated	Unit	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Phenol	Pyrene	Total Detected SVOCs Exceeding Background	Total Detected SVOCs	
																					DL
UBL - Fill Material		DL	DL	DL	560	690	610	690	570	680	DL	1,200	DL	580	DL	560	DL	DL	920	-	-
UBL - Nat. Soils		DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	-	-
SB-41-0-2	U	Fill	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	390U	0	0
SB-41-2-4	U	Fill	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	360U	0	0
SB-41-19-24	U	Fill	530	380U	1,300	2,300	2,200	630	1,700	2,100	380U	4,800	690	710	380U	4,100	380U	3,800	26,000	27,000	
SB-41-24-29	S	Fill	550U	550U	550U	550U	550U	550U	550U	550U	550U	550U	550U	550U	550U	550U	550U	550U	550U	0	0
SB-41-54-59	S	Nat. Soil	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	430U	0	0
SB-42-2-4	U	Fill	1,100	370U	1,800	6,100	5,800	4,900	4,200	4,600	6,100	1,500	12,000	1,200	3,700	1,800	9,900	370U	6,900	71,000	71,000
SB-43-2-4	U	Fill	350U	350U	350U	350U	390	350U	350U	350U	350U	690	350U	350U	350U	480	350U	560	0	2,100	
MW-6-34-39	S	Nat. Soil	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	0	0
MW-6-44-49	S	Nat. Soil	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	440U	0	0
DUP032701A	S	Nat. Soil	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	460U	0	0
GH-2-41	S	Fill	6,100	4,400	17,000	10,000	18,000	7,400	6,700	7,900	11,000	570	37,000	11,000	9,000	24,000	55,000	530U	47,000	270,000	270,000

**INORGANIC COMPOUNDS**  
**SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/ WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)**

	Saturated/Unsaturated		Unit	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL	
UBL - Nat. Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL	
SB-14-0.5-2	U	Fill	6.33U	100	3.16U	3.16U	9.48	51.6	13.0	0.131	6.33U	89.3	47.0	0.959U	
SB-14-16-20	U	Fill	5.54U	104	2.77U	2.77U	11.0	31.7	195	9.43	5.76	17.5	267	1.09U	
SB-14-24-28	S	Fill	5.66U	61.8	2.83U	2.83U	9.68	56.4	83.3	0.147	5.66U	18.1	39.1	0.985U	
SB-15-4-8	U	Fill	5.09U	53.1	2.54U	2.54U	7.37	17.1	9.72	0.105U	5.09U	47.6	32.5	1.1U	
SB-15-36-41	S	Fill	4.6U	25.6	2.3U	2.3U	4.68	4.43	10.0	0.0957U	4.6U	7.70	11.7	1.17	
SB-16-0.5-2	U	Fill	6.26U	65.3	3.13U	3.13U	17.2	39.2	10.4	0.124U	6.26U	75.3	18.8	1.13U	
SB-16-2-4	U	Fill	4.63U	6.52	2.32U	2.32U	2.77	3.19	7.94	0.288	4.63U	24.6	9.58	0.754U	
SB-16-19-24	U	Fill	5.19U	88.1	2.59U	2.59U	14.9	12.3	125	0.202	5.19U	31.5	118	0.735U	
SB-16-24-29	S	Fill	5.41U	37.5	2.71U	2.71U	9.28	16.9	62.1	0.299	5.41U	19.9	48.4	0.739U	
SB-16-29-34	S	Nat. Soil	5.26U	76.0	2.63U	2.63U	9.88	2.82	16.3	0.131U	5.26U	9.81	14.3	1.08U	
SB-16-34-37	S	Nat. Soil	4.36U	9.77	2.18U	2.18U	3.73	2.18U	7.69	0.11U	4.36U	5.88	4.98	1.06U	
SB-17-0.5-2	U	Fill	6.02U	114	3.01U	3.01U	9.93	23.3	16.8	0.112	6.28	43.1	48.1	1.2U	
SB-17-2-4	U	Fill	5.16U	80.1	2.58U	2.58U	8.10	19.8	14.7	0.115U	5.16U	37.4	31.2	1.25U	
SB-17-16-20	U	Fill	5.91U	44.2	2.95U	2.95U	11.4	13.2	54.3	0.170	5.91U	14.0	58.3	0.738U	
SB-17-24-28	S	Fill	4.95U	75.4	2.47U	2.47U	10.5	9.51	41.9	0.223	5.05	30.8	40.5	0.833U	
SB-17-29-33	S	Fill	5.78	84.4	2.78U	2.78U	10.9	12.2	73.4	0.159	5.57U	21.5	83.5	1.03U	
SB-17-44-49	S	Nat. Soil	6.89U	157	3.44U	3.44U	37.1	21.6	16.5	0.128U	13.4	62.1	57.9	1.32U	
SB-17-49-51	S	Nat. Soil	5.35U	13.4	2.67U	2.67U	6.44	2.67U	5.35U	0.116U	5.35U	8.64	7.36	0.989U	
SB-17-54-59	S	Nat. Soil	5.29U	24.0	2.64U	2.64U	7.35	3.66	5.29U	0.118U	5.29U	5.29U	13.2	0.97U	
SB-18-0.5-2	U	Fill	5.44U	68.2	2.72U	2.72U	9.84	20.5	24.6	0.135	5.44U	46.1	39.4	1.17U	
SB-18-2-4	U	Fill	3.98U	65.4	1.99U	1.99U	10.9	16.8	77.1	0.191	4.34	39.8	55.9	1.11U	
SB-18-16-18	U	Fill	3.61U	59.6	1.81U	1.81U	7.78	12.1	70.6	0.821	3.61U	23.6	62.6	1.11U	
SB-18-28-32	S	Fill	5.96U	111	2.98U	2.98U	29.1	18.3	14.0	0.0988U	10.1	65.7	44.0	1.28U	
SB-18-32-36	S	Nat. Soil	4.82U	74.6	2.41U	2.41U	14.6	7.79	14.5	0.111U	5.54	28.7	23.6	1.81	
SB-18-56-60	S	Nat. Soil	5.78U	68.8	2.89U	2.89U	22.7	14.2	6.91	0.105U	9.04	40.9	41.9	1.33U	
SB-19-0.5-2	U	Fill	4.81U	87.9	2.4U	2.4U	11.2	63.7	13.5	0.105U	6.72	67.0	44.5	1.01U	
SB-19-2-4	U	Fill	4.32U	29.9	2.16U	2.16U	8.07	16.4	21.6	0.102	4.32U	25.9	16.9	0.96U	

**INORGANIC COMPOUNDS**  
**SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/ WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)**

	Saturated/Unsaturated	Unit	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
DUP032101A	U	Fill	4.79U	29.4	2.4U	2.4U	6.75	14.6	11.2	0.11U	4.79U	24.3	11.2	0.873U
SB-19-4-8	U	Fill	4.62U	47.6	2.31U	2.31U	7.34	11.3	11.1	0.0963U	4.62U	20.8	13.8	1.08U
SB-19-8-11	U	Nat. Soil	4.74U	9.42	2.37U	2.37U	4.84	2.37U	4.74U	0.108U	4.74U	9.66	4.74U	1U
SB-20-0-2	U	Fill	31.5	47.5	2.47U	2.47U	25.0	21.8	117	0.825	5.85	50.1	97.2	1.27U
DUP031501B	U	Fill	5.3U	88.3	2.65U	2.65U	12.3	36.1	11.3	0.112U	6.74	60.6	39.4	1.22U
SB-20-2-4	U	Fill	4.64U	50.4	2.32U	2.32U	9.05	16.6	28.0	1.14	4.64U	34.9	33.6	1.17U
SB-20-4-8	U	Fill	5.24U	65.4	2.62U	2.62U	12.2	14.3	33.3	0.170	5.25	29.9	45.5	1.1U
SB-20-9-13	U	Nat. Soil	4.15U	8.32	2.07U	2.07U	8.22	2.98	8.55	0.103U	4.15U	6.97	6.24	1.13U
SB-21-0-2	U	Fill	5.98U	76.7	2.99U	2.99U	10.6	21.2	51.4	0.357	5.98U	40.8	153	0.936U
DUP030601A	U	Fill	5.69U	60.9	2.85U	2.85U	23.5	19.7	68.6	0.202	5.69U	73.5	73.8	1.07U
SB-21-2-4	U	Fill	6.04U	134	3.02U	3.02U	7.32	31.4	13.0	0.129	9.09	62.1	48.2	0.992U
SB-21-12-16	U	Fill	5.88U	47.8	2.94U	2.94U	13.4	19.3	61.1	0.284	5.88U	25.5	68.8	0.879U
SB-21-16-20	U	Fill	5.56	50.4	2.71U	2.71U	29.4	14.3	57.8	0.276	5.42U	40.1	45.0	1.08U
SB-21-28-30	S	Fill	5.23U	47.4	2.62U	2.62U	9.72	17.1	54.6	1.36	5.23U	20.7	43.2	0.772U
SB-21-44-48	S	Nat. Soil	5.86U	171	2.93U	2.93U	37.1	21.6	12.3	0.123U	12.1	69.2	61.9	1.25U
SB-21-60-64	S	Nat. Soil	6.38U	78.9	3.19U	3.19U	18.8	10.1	6.38U	0.131U	6.38U	33.4	32.1	0.886U
SB-22-0-2	U	Fill	5.56U	92.1	2.78U	2.78U	8.45	18.9	10.3	0.108U	5.56U	50.8	36.4	0.912U
SB-22-2-4	U	Fill	4.55U	52.3	2.27U	2.27U	6.78	11.1	36.7	0.121	4.55U	26.7	43.3	1.03U
SB-22-19-24	U	Fill	5.29U	31.8	2.64U	2.64U	9.38	31.1	138	0.161	5.29U	17.6	62.3	0.828U
SB-22-24-29	S	Nat. Soil	5.77U	33.2	2.89U	2.89U	8.44	5.33	32.1	0.164	5.77U	16.7	30.0	0.734U
SB-22-59-62	S	Nat. Soil	4.02U	13.3	2.01U	2.01U	4.51	2.01U	4.02U	0.111U	4.02U	5.01	10.9	0.901U
SB-23-0-2	U	Fill	6.58U	80.8	3.29U	3.29U	8.31	14.1	7.82	0.12U	6.58U	48.4	34.0	0.996U
DUP032201B	U	Fill	4.2U	49.0	2.1U	2.1U	7.32	18.4	7.20	0.106U	4.2U	39.6	33.5	1.02U
SB-23-2-4	U	Fill	5.01U	50.9	2.5U	2.5U	10.9	9.20	39.9	0.554	5.01U	19.5	30.1	0.944U
SB-23-14-19	U	Fill	6.81	288	2.42U	2.42U	18.5	37.6	298	1.18	10.3	23.6	544	1U
SB-23-24-29	S	Fill	4.45U	60.7	2.23U	2.23U	13.0	18.2	42.4	0.133	4.78	17.9	60.5	0.767U
SB-23-59-62	S	Nat. Soil	6.21U	38.3	3.1U	3.1U	13.3	5.57	6.21U	0.124U	6.21U	25.8	20.7	0.852U

**INORGANIC COMPOUNDS**  
**SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/ WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)**

			Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
	Saturated/Unsaturated	Unit												
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
SB-24-0-2	U	Fill	5.38U	74.6	2.69U	2.69U	13.5	11.6	151	0.650	5.38U	24.7	86.6	0.889U
SB-24-2-4	U	Fill	5.44U	42.4	2.72U	2.72U	9.63	11.5	80.9	0.601	5.44U	23.9	53.7	0.748U
SB-24-8-12	U	Fill	5.32U	191	2.66U	2.66U	9.75	13.8	338	0.412	5.32U	19.3	462	1.08U
SB-24-32-34	S	Fill	6.43U	74.5	3.22U	3.22U	15.9	958	152	0.465	6.43U	31.6	106	1.24U
SB-24-40-42	S	Nat. Soil	6.11U	40.1	3.06U	3.06U	7.44	4.36	14.5	0.112U	6.11U	14.4	12.5	0.745U
SB-24-44-48	S	Nat. Soil	6.56U	186	3.28U	3.28U	41.9	21.2	12.1	0.126	15.0	72.5	63.0	1.11U
DUP030101A	S	Nat. Soil	6.43U	175	3.22U	3.22U	43.2	20.5	13.8	0.126U	14.4	76.2	59.0	0.928U
SB-24-52-56	S	Nat. Soil	5.26U	134	2.63U	2.63U	29.8	15.2	10.4	0.109U	11.1	55.2	45.3	0.958U
SB-25-0.5-2	U	Fill	5.25U	56.9	2.63U	2.63U	10.3	14.6	67.3	0.289	5.25U	28.7	59.1	0.793U
SB-25-2-4	U	Fill	5.4U	23.0	2.7U	2.7U	6.21	9.23	29.5	0.154	5.4U	13.1	21.5	0.879U
SB-25-16-20	U	Fill	3.46U	93.6	1.73U	1.73U	9.10	10.1	85.3	0.346	3.76	22.4	104	0.942U
SB-25-28-32	S	Fill	4.97U	50.5	2.49U	2.49U	17.2	8.63	20.9	0.454	4.97U	38.3	26.2	1.01U
SB-25-44-48	S	Nat. Soil	5.47U	169	2.74U	2.74U	36.0	20.7	36.3	0.134U	11.7	74.5	61.9	1.32U
SB-25-56-60	S	Nat. Soil	6.15U	160	3.07U	3.07U	31.0	18.8	10.7	0.131U	10.6	60.8	47.9	0.842U
SB-25-60-61	S	Nat. Soil	6.48U	91.9	3.24U	3.24U	25.6	13.4	7.49	0.139U	11.5	52.1	46.3	0.87U
SB-26-0.5-2	U	Fill	5.19U	50.1	2.6U	2.6U	14.2	27.9	15.7	0.203	5.19U	43.0	22.7	0.999U
SB-26-2-4	U	Fill	5.11U	33.8	2.55U	2.55U	9.96	14.1	89.3	0.151	5.11U	18.7	59.8	0.883U
SB-26-8-12	U	Fill	5.53U	54.2	2.77U	2.77U	13.3	6.60	20.1	0.125	5.53U	32.0	24.0	1.01U
DUP030201A	U	Fill	5.25U	104	2.62U	2.62U	14.5	9.00	59.9	0.286	6.14	31.8	39.6	0.823U
SB-26-20-24	U	Fill	5.36U	42.4	2.68U	2.68U	7.86	24.7	75.1	0.237	5.36U	18.0	41.9	1.01U
SB-26-32-36	S	Fill	5.93U	5.93U	2.96U	2.96U	9.67	3.57	6.65	0.438	5.93U	10.8	5.93U	1.14U
SB-26-48-51	S	Nat. Soil	5.74U	58.8	2.87U	2.87U	15.8	6.76	6.87	0.118U	5.74U	29.6	22.1	1.03U
SB-26-51-52	S	Nat. Soil	5.9U	48.8	2.95U	2.95U	13.1	3.70	5.9U	0.122U	11.5	25.0	54.6	0.888U
SB-27-0.5-1.5	U	Fill	5.6U	53.9	2.8U	2.8U	10.4	15.7	57.4	0.242	5.6U	33.6	40.5	0.933U
SB-27-2-4	U	Fill	5.3U	42.0	2.65U	2.65U	11.5	24.8	104	0.266	5.3U	20.5	71.7	0.986U
SB-27-8-12	U	Fill	7.47	209	3.23U	3.23U	22.6	89.1	634	4.59	6.46U	19.6	219	1.44
SB-27-16-20	U	Nat. Soil	5.93U	44.7	2.96U	2.96U	11.8	4.69	18.5	0.154	5.93U	21.1	10.2	0.766U

**INORGANIC COMPOUNDS**  
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**MACON 2 FORMER MGP FACILITY/ WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)**

	Saturated/Unsaturated	Unit	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
SB-27-20-21	S	Nat. Soil	5.43U	5.43U	2.72U	2.72U	9.62	3.55	6.35	0.115U	5.43U	11.0	5.43U	1.04U
SB-28-0.5-2	U	Fill	6.13U	81.0	3.06U	3.06U	10.0	57.6	12.5	0.115	6.13U	56.0	33.3	1.23U
SB-28-2-4	U	Fill	6U	85.4	3U	3U	8.53	44.7	9.52	0.12U	6U	48.6	41.1	1.2U
SB-28-4-8	U	Fill	6.15U	73.1	3.08U	3.08U	12.6	16.8	76.3	0.814	6.15U	31.9	101	1.25U
SB-28-8-9.5	U	Nat. Soil	4.91U	5.88	2.46U	2.46U	5.26	2.46U	6.35	0.105U	4.91U	9.80	4.91U	1.09U
SB-29-0.5-2	U	Fill	4.24U	50.3	2.12U	2.12U	14.7	42.6	11.6	0.126U	4.24U	72.8	17.3	1.13U
DUP030501A	U	Fill	6.34U	119	3.17U	3.17U	11.6	56.9	22.0	0.149	6.34U	60.9	28.8	0.759U
SB-29-2-4	U	Fill	4.6U	67.2	2.3U	2.3U	13.2	31.7	12.8	0.114U	4.72	44.6	29.6	1.15U
SB-29-20-24	U	Fill	5.35U	17.3	2.67U	2.67U	5.78	3.64	14.1	0.134	5.35U	22.1	13.3	0.841U
SB-29-28-32	S	Fill	3.65U	72.9	1.83U	1.83U	16.3	4.99	11.0	0.555	4.11	22.7	22.6	1.03U
SB-29-48-52	S	Nat. Soil	5.55U	88.0	2.77U	2.77U	21.1	10.5	8.98	0.138U	9.46	35.9	37.4	1.36U
SB-29-52-53	S	Nat. Soil	5.07U	9.52	2.53U	2.53U	5.69	2.53U	5.07U	0.11U	5.07U	14.7	17.8	1.04U
SB-30-0-2	U	Nat. Soil	2.98U	25.5	1.49U	1.49U	11.1	5.28	7.46	0.0913U	2.98U	12.9	15.2	0.817U
DUP041201A	U	Nat. Soil	3.59U	33.5	1.8U	1.8U	10.7	5.67	6.34	0.103U	3.59U	16.5	18.7	0.889U
SB-30-2-4	U	Nat. Soil	2.78U	45.7	1.39U	1.39U	13.1	8.69	11.2	0.101U	3.72	21.6	19.8	1.03U
SB-30-8-12	S	Nat. Soil	3.83U	128	1.91U	1.91U	30.6	19.7	16.3	0.154	11.1	62.8	44.0	1.13U
SB-30-16-20	S	Nat. Soil	4.14U	159	2.15	2.07U	40.9	19.6	12.3	0.122U	14.2	72.0	66.6	1.27U
SB-31-0-2	U	Nat. Soil	5.03U	102	2.51U	2.51U	18.9	12.9	21.2	0.12U	7.42	35.5	51.0	1.17U
SB-31-2-4	U	Nat. Soil	5.3U	93.0	2.65U	2.65U	18.8	14.0	23.5	0.125U	6.19	36.7	37.9	0.976U
SB-31-4-8	U	Nat. Soil	5.8U	119	2.9U	2.9U	26.5	15.8	14.1	0.126U	9.05	54.3	37.1	0.856U
SB-31-8-12	U	Nat. Soil	6.55U	40.2	3.28U	3.28U	8.43	4.19	6.55U	0.124U	6.55U	16.7	12.8	0.960U
SB-31-16-20	S	Nat. Soil	5.76U	57.2	2.88U	2.88U	15.9	7.29	5.76U	0.125U	5.76U	30.4	24.3	0.718U
SB-32-0-2	U	Nat. Soil	5.09U	95.0	2.55U	2.55U	19.5	13.0	20.4	0.12U	6.62	37.2	43.0	0.871U
SB-32-2-4	U	Nat. Soil	5.57U	85.5	2.79U	2.79U	20.1	12.0	43.0	0.121U	6.32	38.2	27.8	0.995U
SB-32-4-8	U	Nat. Soil	6.04U	83.5	3.02U	3.02U	18.0	10.1	12.1	0.121U	6.04U	38.8	22.8	0.74U
SB-32-16-20	S	Nat. Soil	6.18U	63.5	3.09U	3.09U	20.6	6.00	6.18U	0.126U	6.18U	26.7	22.3	0.941U
SB-33-0.5-2	U	Fill	4.4U	99.7	2.2U	2.2U	8.10	6.71	32.9	0.174	4.4U	21.7	33.5	0.929U

**INORGANIC COMPOUNDS**  
**SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/ WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)**

	Saturated/Unsaturated		Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
	Unit													
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
SB-33-2-4	U	Fill	4.58U	81.1	2.29U	2.29U	22.0	43.4	65.8	0.541	4.58U	43.4	73.7	1.02U
SB-33-8-10	U	Fill	5.67U	11.1	2.84U	2.84U	28.7	5.74	5.67U	0.247	5.67U	58.9	6.33	1.02U
SB-33-10-14	U	Nat. Soil	5.43U	5.43U	2.72U	2.72U	5.58	2.72U	5.43U	0.105U	5.43U	10.6	5.43U	0.963U
SB-34-0.5-2	U	Fill	4.61U	87.2	2.31U	2.31U	9.40	42.2	149	0.241	8.29	17.3	160	0.82U
SB-34-2-4	U	Fill	4.93U	41.5	2.47U	2.47U	12.9	10.8	60.1	0.318	4.93U	24.5	58.8	0.87U
SB-34-4-8	U	Fill	4.92U	95.7	2.46U	2.46U	14.4	10.8	95.7	0.264	4.92U	18.8	85.4	1.08U
SB-34-8-10	U	Nat. Soil	5.04U	5.04U	2.52U	2.52U	2.52U	2.52U	5.04U	0.101U	5.04U	5.04U	5.04U	1.03U
SB-36-0.5-2	U	Fill	4.23U	24.8	2.12U	2.12U	12.3	8.42	8.98	0.0938U	4.23U	24.7	15.9	1.07U
SB-36-2-4	U	Fill	7.05	70.1	2.55U	2.55U	46.3	74.9	282	0.380	5.1U	79.3	339	0.908U
SB-36-4-6	U	Nat. Soil	6.56U	6.56U	3.28U	3.28U	5.63	3.28U	6.56U	0.122U	6.56U	14.6	6.56U	1.06U
SB-38-0-2	U	Fill	5.69U	54.4	2.84U	2.84U	11.5	11.9	135	0.248	5.69U	27.8	106	1.14U
DUP041201B	U	Fill	5.63U	57.1	2.82U	2.82U	8.49	11.6	94.3	0.182	5.63U	21.9	95.8	1.13U
SB-38-2-4	U	Fill	5.55U	63.9	2.77U	2.77U	9.08	12.4	116	0.336	5.55U	20.9	102	1.11U
SB-38-4-6.5	U	Fill	6.08U	21.6	3.04U	3.04U	9.68	5.54	18.1	0.117U	6.08U	17.2	15.8	1.22U
SB-38-6.5-9	U	Nat. Soil	6.72U	84.1	3.36U	3.36U	16.3	9.53	7.88	0.133U	6.72U	33.9	23.8	1.34U
SB-38-9-11.5	U	Nat. Soil	6.32U	91.5	3.16U	3.16U	23.5	11.3	6.33	0.119U	7.62	45.9	38.8	1.26U
SB-38-11.5-14	U	Nat. Soil	6.15U	83.4	3.08U	3.08U	24.6	11.9	7.47	0.122U	8.45	55.0	41.1	1.23U
SB-38-14-16.5	U	Nat. Soil	6.62U	63.2	3.31U	3.31U	17.7	10.1	6.62U	0.126U	8.24	32.8	35.1	1.32U
SB-38-16.5-19	U	Nat. Soil	6.65U	51.2	3.32U	3.32U	15.5	8.44	6.65U	0.131U	6.65U	32.3	27.7	1.33U
SB-38-19-21.5	S	Nat. Soil	6.51U	92.5	3.26U	3.26U	20.0	11.6	6.95	0.121U	6.88	36.6	40.2	1.3U
SB-38-21.5-24	S	Nat. Soil	6.35U	65.9	3.18U	3.18U	15.0	9.66	6.35U	0.118U	6.35U	34.6	27.0	1.27U
SB-38-24-26.5	S	Nat. Soil	6.64U	30.1	3.32U	3.32U	7.76	4.02	6.64U	0.124U	6.64U	15.9	13.3	1.33U
SB-38-26.5-29	S	Nat. Soil	6.53U	110	3.26U	3.26U	24.5	13.8	8.34	0.123U	8.28	48.1	42.5	1.31U
SB-38-29-31.5	S	Nat. Soil	6.92U	155	3.46U	3.46U	36.3	23.1	13.6	0.124U	11.1	68.4	57.6	1.38U
SB-38-31.5-34	S	Nat. Soil	6.84U	155	3.42U	3.42U	35.3	22.1	14.7	0.125U	10.3	71.9	50.8	1.37U
SB-38-34-36	S	Nat. Soil	5.96U	169	2.98U	2.98U	41.4	23.4	15.0	0.136U	15.9	78.3	60.7	0.991U
SB-38-36-38	S	Nat. Soil	6.27U	147	3.14U	3.14U	39.4	19.5	14.6	0.126U	12.1	75.0	46.9	1.2U

**INORGANIC COMPOUNDS**  
**SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/ WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)**

		Saturated/Unsaturated	Unit	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
UBL - Fill Material				7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils				DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
SB-38B-0-2	U	Fill	4.8U	53.8	2.4U	2.4U	10.3	11.6	59.1	0.132	4.8U	23.8	65.2	0.971U	
DUP041301A	U	Fill	5.41U	52.9	2.7U	2.7U	11.2	11.0	72.6	0.156	5.41U	23.6	69.5	0.915U	
SB-38B-2-4	U	Fill	4.89U	69.9	2.44U	2.44U	10.2	11.5	164	0.318	4.89U	20.3	145	0.749U	
SB-38B-4-6	U	Fill	4.1U	59.4	2.05U	2.05U	11.6	12.3	77.9	0.188	14.4	20.4	76.6	0.881U	
SB-38B-6-8	U	Fill	4.54U	63.3	2.27U	2.27U	11.6	21.1	65.9	0.385	4.54U	50.1	62.4	0.678U	
SB-38B-8-10	U	Fill	4.26U	52.8	2.13U	2.13U	16.0	17.1	73.2	0.329	6.05	19.6	61.7	0.795U	
SB-38B-10-12	U	Fill	4.27U	49.7	2.13U	2.13U	9.43	11.8	75.7	0.293	4.27U	19.0	64.1	0.801U	
SB-39-0.5-2	U	Fill	6.3U	53.6	3.15U	3.15U	6.34	44.5	8.97	0.12U	6.3U	39.0	20.1	1.01U	
SB-39-4-8	U	Fill	4.98U	58.0	2.49U	2.49U	12.8	39.8	68.0	0.262	5.70	30.4	32.9	0.958U	
SB-39-8-12.5	U	Fill	5.17U	42.3	2.59U	2.59U	14.7	27.1	23.1	0.191	5.17U	34.1	21.6	1.03U	
SB-40-0.5-2	U	Fill	5.92U	51.2	2.96U	2.96U	10.2	18.3	25.7	0.185	5.92U	46.8	43.3	1.06U	
SB-40-2-4	U	Fill	5.58U	83.7	2.79U	2.79U	11.8	10.5	135	0.402	5.58U	26.9	136	1.15U	
SB-40-16-20	U	Fill	5.03U	74.0	2.51U	2.51U	5.83	13.4	140	0.498	5.03U	12.4	105	1.03U	
SB-40-24-28	S	Fill	4.27U	53.9	2.13U	2.13U	8.94	6.36	17.2	0.0996	5.80	13.7	24.0	0.985U	
SB-40-40-44	S	Nat. Soil	6.52U	119	3.26U	3.26U	27.0	13.7	7.16	0.118U	10.0	48.4	47.6	0.985U	
DUP032001A	S	Nat. Soil	6.45U	104	3.23U	3.23U	24.1	14.2	6.82	0.127U	8.93	45.0	43.1	0.889U	
SB-40-56-58	S	Nat. Soil	6.27U	104	3.14U	3.14U	31.3	16.6	10.3	0.108U	10.4	58.9	44.9	0.897U	
SB-41-0-2	U	Fill	5.56U	92.0	2.78U	2.78U	12.0	35.2	11.2	0.101U	6.82	59.8	48.5	1.08U	
SB-41-2-4	U	Fill	4.75U	63.2	2.37U	2.37U	11.3	12.9	7.25	0.101U	5.45	43.6	37.3	0.878U	
SB-41-19-24	U	Fill	4.97U	279	2.49U	2.49U	10.8	9.66	166	0.228	4.97U	18.5	219	0.961U	
SB-41-24-29	S	Fill	6.39U	212	3.19U	3.19U	13.0	9.02	484	1.99	6.39U	18.6	84.4	0.998U	
SB-41-54-59	S	Nat. Soil	5.78U	114	2.89U	2.89U	31.3	17.3	10.4	0.125U	10.8	58.1	46.3	1.09U	
SB-43-2-4	U	Fill	3.79U	69.2	1.9U	1.9U	7.01	7.78	166	0.242	3.79U	14	96.9	0.854U	
SB-43-4-8	U	Fill	2.98U	70.4	1.49U	1.49U	14.5	11.7	170	0.274	3.1	18.6	124	0.928U	
SB-43-8-12	U	Fill	3.86U	126	1.93U	1.93U	9.11	9.22	99.2	0.139	3.86U	28	71.2	1.03U	
SB-43-12-16	U	Fill	4.14U	78.6	2.07U	2.07U	16.7	12	113	0.253	4.91	24.6	86.8	0.971U	
SB-43-16-20	U	Fill	3.07U	55.9	1.54U	1.54U	13.90	9.16	51.3	0.134U	3.86	25.3	55.7	1.09U	



# **APPENDIX D**

Williams Project No. 1100-2990

# **COMPLIANCE STATUS INVESTIGATION REPORT**

**FORMER MACON 2 MGP FACILITY  
MACON, GEORGIA**

*Prepared For:*  
**Georgia Power Company  
Atlanta Gas Light Company  
and  
The City of Macon**

*Prepared By:*  
**WILLIAMS ENVIRONMENTAL SERVICES INC.  
500 Chase Park South, Suite 150  
Birmingham, Alabama 35244**

*Preparation Date: June 17, 2002  
Revised September 5, 2003*



## STATEMENT OF FINDINGS

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The Compliance Status Investigation (CSI) detailed in this report was performed by Williams Environmental Services, Inc. (Williams) on behalf of the City of Macon, the Georgia Power Company, and Atlanta Gas Light Company. The purpose of the study was to define the properties affected by a release at the former Macon 2 Manufactured Gas Plant (MGP) facility in Macon, Georgia, as well as to determine the compliance status of the properties with regard to Risk Reduction Standards (RRSs) established under the Georgia Hazardous Site Response Act (HSRA). Other objectives of the study were to delineate the extent of constituents of interest (COI) in soil and groundwater, to identify and characterize potential sources, and to identify possible human and environmental receptors potentially exposed to a release.

A Site, as defined in the report, includes all properties affected by a release of a reportable quantity of a regulated substance at or from the former MGP operations. The properties defined as part of this Site include the parcel on which the former MGP facility was located, some of the adjacent and nearby parcels, and portions of street and railroad rights-of-way near the former MGP facility.

The study includes field investigations conducted by Williams to sample soil, sediment, and groundwater at the Site, to verify the location of former MGP structures and characterize their contents, to determine background concentrations of the COI in soil and groundwater and to determine the leaching potential for COI in soil to reach groundwater. Also incorporated into this report are the results of previous investigations (Preliminary Assessment and Site Inspection) conducted by Law Environmental, Inc. (LAW).

Known and potential sources of the regulated substances identified at the Site include the former MGP structures (two gas holders, oil tanks, purifier room, condensers, and coal storage area and areas of former MGP operations). Minor amounts of tar-like and oil-like material and other by-products of the MGP processes, including slag-like material and coal fines, were found in and around remnants of the structures and former areas of MGP operations.

The COI analyzed in the soil and groundwater samples collected during the CSI included semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), and inorganics (metals and cyanide) that are commonly associated with former MGP facilities.

The extent of COI associated with the former MGP operations in soils and groundwater have been defined in all directions. The area of soils and groundwater impacts include the majority of the former MGP facility and nearby parcels to the northeast, east, and southeast.

The former MGP facility is presently secured by fencing and according to water well surveys performed, no water wells are located within a three mile-radius of the property. Potential exposure points on the property are limited to those areas where construction or excavation activities may allow potential receptors such as workers to come in contact with COI in soils or groundwater.

Types 1 through 4 RRSs for soil and groundwater were developed from the results of the background study, laboratory detection limits, and default assumptions set forth by the Georgia Environmental Protection Division. Type 4 RRSs in soil were refined based on results of a leaching potential study, default assumptions for surface soils, and construction worker exposure assumptions for subsurface soils. The Site was evaluated for compliance with HSRA Types 1 through 4 RRSs. All COI in soil at the Site are in compliance with Type 4 RRSs. All COI in groundwater at the Site are in compliance with Type 1 RRSs.

# CERTIFICATION OF COMPLIANCE WITH RISK REDUCTION STANDARDS

---

I certify under penalty of law that this report and all attachments were prepared under my direction 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 fine and imprisonment for knowing violations.

Based on my review of the findings of this report with respect to the risk-reduction standards of the Rules for Hazardous Site Response, Rule 391-3-19-.07, I have determined that the following properties (identified by Bibb County, Georgia, Tax Parcel ID numbers, if applicable, and as outlined in this report) are in compliance with Type 1 risk reduction standards for soil and groundwater:

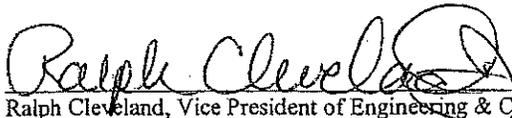
Parcel No. OC-98-5A  
Parcel No. OC-98-5C  
Parcel No. OC-98-5D  
Parcel No. OC-98-5G  
Parcel No. OC-98-5H  
Parcel No. OC-98-5I  
Parcel No. OC-98-5JA  
Parcel No. OC-98-4F  
Parcel No. OC-98-4H  
Parcel No. OC-98-3A(3B)  
Parcel No. OC-98-3D  
Parcel No. OC-98-2A(2B)

The following properties are in compliance with Type 4 risk reduction standards for soil and Type 1 risk reduction standards for groundwater:

Parcel No. OC-98-5J  
Parcel No. OC-99-4A  
Parcel No. OC-99-4AB  
Portions of Right-of-Way of Norfolk Southern Railroad  
Portions of Right-of-Way of Willow Street  
Portions of Right-of-Way of Spring Street Lane

Certified by:

Date:

  
\_\_\_\_\_  
Ralph Cleveland, Vice President of Engineering & Construction  
Atlanta Gas Light Company

9/5/03

# **CERTIFICATION OF COMPLIANCE WITH RISK REDUCTION STANDARDS**

---

I certify under penalty of law that this report and all attachments were prepared under my direction 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 fine and imprisonment for knowing violations.

Based on my review of the findings of this report with respect to the risk-reduction standards of the Rules for Hazardous Site Response, Rule 391-3-19-.07, I have determined that the following properties (identified by Bibb County, Georgia, Tax Parcel ID numbers, if applicable, and as outlined in this report) are in compliance with Type 1 risk reduction standards for soil and groundwater:

Parcel No. OC-98-5A  
Parcel No. OC-98-5C  
Parcel No. OC-98-5D  
Parcel No. OC-98-5G  
Parcel No. OC-98-5H  
Parcel No. OC-98-5I  
Parcel No. OC-98-5JA  
Parcel No. OC-98-4F  
Parcel No. OC-98-4H  
Parcel No. OC-98-3A(3B)  
Parcel No. OC-98-3D  
Parcel No. OC-98-2A(2B)

The following properties are in compliance with Type 4 risk reduction standards for soil and Type 1 risk reduction standards for groundwater:

Parcel No. OC-98-5J  
Parcel No. OC-99-4A  
Parcel No. OC-99-4AB  
Portions of Right-of-Way of Norfolk Southern Railroad  
Portions of Right-of-Way of Willow Street  
Portions of Right-of-Way of Spring Street Lane

Certified by:

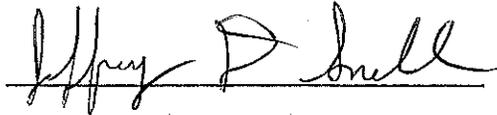
Date:

---

Honorable C. Jack Ellis, Mayor  
City of Macon

## GROUNDWATER SCIENTIST STATEMENT

I certify that I am a qualified ground-water scientist who has received a baccalaureate or post-graduate degree in the natural sciences or engineering, and have sufficient training and experience in ground-water hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgments regarding ground-water monitoring and contaminant fate and transport. I further certify that revisions to this report (Compliance Status Investigation Report, revised September 5, 2003 completed for the City of Macon, the Georgia Power Company, and Atlanta Gas Light Company, Former Macon 2 MGP Facility - Macon, Georgia) were prepared by appropriate qualified subordinates working under my direction.



Jeffrey D. Snell, P.G.

Professional Geologist

Certification Number 1630

9/5/03

Date



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**COMPLIANCE STATUS INVESTIGATION REPORT  
FORMER MACON 2 MGP FACILITY, MACON, GEORGIA  
WILLIAMS PROJECT NO. 1100-2990**

**SECTION 1  
INTRODUCTION**



# SECTION 1

## INTRODUCTION

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Georgia Power Company, Atlanta Gas Light Company, and the City of Macon (Parties) retained Williams Environmental Services, Inc. (Williams) to conduct a Compliance Status Investigation (CSI) of a former manufactured gas plant (MGP) facility at the intersection of Spring Street Lane and Willow Street, Macon, Bibb County, Georgia (Georgia Hazardous Site Response Act [HSRA] Site Number 10692). The facility is designated as "Macon 2" to distinguish it from another former MGP facility (Macon 1) located at 137 Mulberry Street, Macon, Georgia. The CSI was conducted in a manner to meet the requirements of the Georgia HSRA regulations and included the following tasks:

- Identified locations and dimensions of former MGP structures still existing on Site;
- Chemically characterized (fingerprinted) potential by-product-like material and impacted soil from former MGP sources;
- Identified and chemically characterized (fingerprinted) non-MGP sources that may have contributed to soil or groundwater impacts at the Site;
- Established background concentrations of constituents of interest (COI) for soils and groundwater;
- Completely delineated COI related to the former MGP operations in soils, horizontally and vertically, at the Site;
- Completely delineated COI related to the former MGP operations in groundwater at the Site;
- Conducted assessment of potential impacts to sediments;
- Acquired data regarding physical properties of soil including porosity, hydraulic conductivity, grain-size distribution, and other relevant properties;
- Acquired data regarding aquifer characteristics;
- Evaluated potential human or environmental receptors that may be exposed to a release from the Site;
- Developed risk reduction standards (RRS) for COI (included evaluation of leaching characteristics); and
- Identified all properties which have been affected by a release from the Site.

The data collected during the CSI have been used in conjunction with data collected during the Preliminary Assessment (PA) and Site Investigation (SI) performed by Law Engineering and Environmental Services, Inc. (LAW) in 1991 and 1992, respectively, to prepare a compliance status report (CSR) as set forth by HSRA regulations in Section 391-3-19-06(3).

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**COMPLIANCE STATUS INVESTIGATION REPORT  
FORMER MACON 2 MGP FACILITY, MACON, GEORGIA  
WILLIAMS PROJECT NO. 1100-2990**

**SECTION 2  
SITE BACKGROUND**

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## SECTION 2

### SITE BACKGROUND

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#### 2.1 SITE DESCRIPTION

The former Macon 2 MGP facility is located to the north of the intersection of Spring Street Lane and Willow Street (Figure 1). The term "Site" in this CSI Report refers to those parcels potentially affected by a release from the former Macon 2 MGP operations. Therefore, based on the data presented in this CSR, the Site includes the property where the former MGP facility was located and certain surrounding parcels and street rights-of-way (Figure 2). The property where the former Macon 2 MGP facility was located is currently owned by the City of Macon and is used by the City of Macon Central Services. Facilities at the property include a combined office/service shop building, a canopied equipment storage area, a warehouse and an employee parking lot (Figure 3). Most of the property is covered with asphalt paving although several areas are paved with concrete including the loading dock area to the southwest of the office/service shop and a concrete area between the equipment storage area and service shop. Grassy areas are located southwest of the office/service shop and near the southeastern property boundary. According to the topographic map of the area, elevations at the property generally range from 300 to 320 feet above mean sea level (Figure 1).

The surrounding properties are primarily commercial and include the Macon Transit Authority (bus garage) to the south, restaurants and a filling station to the west, and a filling station to the northwest. The Ocmulgee River and the Norfolk Southern Railroad are located to the east and northeast of the facility.

#### 2.2 HISTORY OF THE FORMER MGP FACILITY

From the mid-1800's until the 1950's, MGPs in general were widely used for producing gas from coal, coke, or oil. The gas was primarily used for lighting and heating. Most of the manufactured gas was generated by one of the following processes:

- Coal gas;
- Water gas/carburetted gas; or
- Oil gas.

The coal gas process involved the carbonization of coal in retorts (ovens) which produced gas consisting of hydrocarbon elements of the coal. The water gas process involved heating coke or coal in a generator, and subsequently injecting steam into the heated vessel, which produced gas consisting of hydrogen and carbon monoxide. The carburetted process further included the injection and cracking of oil, creating a gas with hydrocarbon elements and a higher BTU content. The oil gas process involved injecting oil into a heated vessel, producing a gas consisting of the hydrocarbon elements of the oil. In all of the processes, the resultant gas was cooled and purified before distribution. As a result, various process residuals such as tars, liquors, and sludges were produced by MGP operations. A generic process flow sheet for MGP operations is presented on Figure 4.

Williams reviewed Sanborn Fire Insurance maps (1889, 1895, 1908, 1924, 1951, 1960 and 1969; included in Appendix A) and aerial photographs (1938, 1958, 1966, 1972, and 1990; included in Appendix A). Williams used this information to identify the approximate former locations of purifier boxes, condensers, a coal storage area, two oil tanks, and two gas holders. Based on the information provided on the Sanborn Fire Insurance Maps, the Macon 2 MGP facility operated prior to 1889 to no later than 1908. During this time, the gas holders were decommissioned prior to 1895.

The Sanborn Fire Insurance map dated 1889 (Appendix A) shows a main building containing purifying boxes and condensers located near the center of the property along what is now referred to as Willow Street. A motor room was located on the northwest corner of this building adjacent to the purifying boxes. Two gasometers existed on the property. The gasometer located on the northwest side of the main building had a capacity of 40,000 cubic feet and will be referred to as Gas Holder No. 1. The gasometer located east of the main building had a capacity of 60,000 cubic feet, and will be referred to as Gas Holder No. 2. Two oil tanks were located to the northeast of the main building and each had a capacity of 8,000 gallons. The property was bounded to the southwest by an alley (now Willow Street), to the northwest by Spring Street, and to the southeast by New Street. An embankment of approximately 20 feet in height was located between the main building and Gas Holder No. 2 with the area to the south and west being of the higher elevation. The surrounding property was primarily residential.

The 1895 Sanborn Fire Insurance map (Appendix A) indicates the configuration of the property boundaries as well as the development of the surrounding properties remained unchanged since 1889 with few exceptions. The 8,000 gallon oil tanks are no longer pictured on the 1895 Sanborn Fire Insurance Map. A coal house was added to the north end of main building. Rose Street is shown bounding the property to the northeast and is depicted as not graded.

The Sanborn Fire Insurance map dated 1908 (Appendix A) indicates that between 1895 and 1908 the facility was abandoned and structures were vacant and not used. The property boundaries as well as the development of the surrounding properties appear to have remained unchanged since 1895. The alley located to the southwest of the property is referred to as Willow Street on the 1908 Sanborn Fire Insurance Map. The embankment dividing the property is no longer identified.

The Sanborn Fire Insurance map dated 1924 (Appendix A) indicates that, at that time, the gas holders and the facility were still abandoned and vacant. The main building is no longer identified. Surrounding property usage appears unchanged between 1889 and 1924. The Norfolk Southern Railway and Ocmulgee River are identified to the northeast of the property. Rose Street is no longer identified as bounding the property to the northeast.

The Sanborn Fire Insurance map dated 1951 (Appendix A) indicates that between 1924 and 1951 the property was cleared of all surficial MGP structures. A gas regulator station located on the southwest property boundary at the corner of Willow Street and Spring Street Lane is the only structure identified on the property. The 1951 Map indicates that in 1950, the parcel to the south of the property was developed and operated by the Bibb Transit Company. This property included a machine shop with tire and parts storage areas and a separate building that included a filling station. The property located to the west of the former MGP facility, on the corner of Ocmulgee (now Riverside Drive) and Spring Street, had been developed into a filling station by 1951. It appears that the southwestern portion of the former

MGP property, adjacent to Willow Street, was used for bus parking by the Bibb Transit Company during this time. The property located to the west of the Bibb Transit Company was developed into a Baptist Church by 1951.

The Sanborn Fire Insurance map dated 1960 (Appendix A) indicates that between 1951 and 1960, the property located to the south of the former MGP facility (west of the Bibb Transit Company) included the development of a paint shop just northeast of the former Baptist Church. The property located across Riverside Drive, south of the former MGP facility, on the corner of Riverside Drive and New Street, was developed into a paint and plate glass company by 1960. A restaurant was built on the property located on the southwest corner of Riverside Drive and Spring Street between 1951 and 1960. All other adjacent properties appeared relatively unchanged between 1951 and 1960.

The Sanborn Fire Insurance map dated 1969 (Appendix A) indicates that between 1960 and 1969, the property located to the southwest of the former MGP property on the corner of Spring Street Lane and Riverside Drive was developed into a radio station. The property located immediately southwest of the former MGP facility, across Willow Street had been developed into a restaurant. A filling station was built on the property located to the north of the former MGP facility between 1960 and 1969.

Historical aerial photographs were obtained for 1938, 1958, 1966, 1972, and 1990. The aerial photograph from 1938 indicated that the facility had been cleared of all building structures by this time. Due to the quality of the 1938 photograph, locations of the former Gas Holders were indistinguishable. The 1958 aerial photograph shows that the buildings associated with the Bibb Transit Company had been constructed and the parcel to the north of property had been cleared by this time. The 1958 aerial photograph also shows the location of Gas Holder No. 1. Based on the aerial photographs, between 1958 and 1966 the eastern and southern portion of the property had been filled. Between 1966 and 1972, additional fill material was placed on the north and northwestern portions of the property. In addition, the property to the southwest of the former MGP facility appears to have been cleared and/or filled between 1966 and 1972. The remaining structure of Gas Holder No. 1 is visible on aerial photographs from 1966 and 1972 but was apparently covered with fill and/or pavement by 1990. Between 1972 and 1990, the current structures on the former MGP facility property, including the office building and canopied storage area, were constructed. By 1990, most of the property is covered by buildings, asphalt, or concrete.

### **2.3 PREVIOUS INVESTIGATIONS**

Law Environmental, Inc. (LAW) conducted a Preliminary Assessment (PA) of the Site in 1991 which included a review of available file material, on-site and off-site reconnaissance, review of historical property ownership and a limited pathway survey. No sampling or analysis was conducted during the PA.

In February and March, 1992, LAW conducted a Site Inspection (SI) which included exploration of subsurface soils, collection and analysis of subsurface soil and groundwater samples, evaluation of soil and groundwater samples, evaluation of soil physical characteristics, ambient air monitoring and review of literature. The following activities were conducted during the SI:

- Seven exploratory soil borings (SB-1 to SB-7) were drilled to collect subsurface soil samples for a preliminary determination of the vertical and horizontal extent of impacted soils;
- Four monitoring wells were installed and screened across the water table (MW-01 to MW-04);
- Selected soil and groundwater samples were analyzed for the Target Compound List (TCL) and Target Analyte List (TAL) constituents using Contract Laboratory Program (CLP) protocol;
- One undisturbed soil sample was collected from soil boring SB-2 for physical parameter analyses including porosity, water content, dry density, hydraulic conductivity, total organic carbon, and organic content; and
- Slug tests were performed in the four monitoring wells (MW-01 through MW-04).

The sampling locations from the SI are provided in Figure 3. Analytical results from soil samples collected during the SI are included in Appendix B-1 and Appendix C-1 includes a summary of the groundwater analytical data collected during the SI.

SACAL Environmental & Management Co. submitted to the EPD a release notification on November 3, 2000, on behalf of the City of Macon. The EPD subsequently listed the Site on the Hazardous Site Inventory on January 5, 2001 (HSI Site No. 10692).

#### 2.4 SITE-SPECIFIC CONSTITUENTS OF INTEREST

The materials of interest at MGP sites include tar, oil, and associated sludges that are complex mixtures of different polynuclear aromatic hydrocarbons (PAHs), lesser amounts of phenolics and volatile organic compounds (VOCs), and some inorganics such as various metals and cyanide. The Gas Research Institute (Management of Manufactured Gas Plant Sites, Volume I, Wastes and Constituents of Interest, October 1987 and later revisions) identifies a list of chemicals present at most MGP sites. Analytical data presented by LAW indicates that some of those chemicals on the list are present at the former MGP facility.

A list of constituents of interest (COI) for the Site was prepared based on the Gas Research Institute list plus those compounds detected in the SI above the HSRA notification concentration (NC) in soils or above background levels in groundwater. The Site-specific COI are listed in Table 2.1.

TABLE 2.1  
SITE-SPECIFIC CONSTITUENTS OF INTEREST

Semivolatiles	Volatiles	Inorganics
Acenaphthene	Benzene	Arsenic
Acenaphthylene	Carbon Disulfide	Barium
Anthracene	Ethylbenzene	Beryllium
Benzo(a)anthracene	Methylene Chloride	Cadmium
Benzo(a)pyrene	Toluene	Chromium
Benzo(b)fluoranthene	Total Xylenes	Copper
Benzo(g,h,i)perylene		Lead
Benzo(k)fluoranthene		Mercury
Chrysene		Nickel
Dibenzo(a,h)anthracene		Vanadium
Fluoranthene		Zinc
Fluorene		Total Cyanide
Indeno(1,2,3-cd)pyrene		
Naphthalene		
Phenanthrene		
Phenol		
Pyrene		

## 2.5 POTENTIAL SOURCES

Sources which potentially have or are contributing to a release of a hazardous constituent or substance at the former MGP facility were defined during the PA, SI and CSI. The potential sources include former MGP structures which continue to exist today in whole or in part, former MGP structures or equipment which have been removed, areas where by-products of the process were stored and/or placed, and other potential sources not located on the former MGP property. These potential sources are described in greater detail in Sections 2.5.1 and 2.5.2. The quantity and chemical composition of releases (if any) associated with the identified potential sources are not known. However, based on literature and experience, VOCs and semivolatile organic compounds (SVOCs), including PAHs, are usually associated with sources where tar was accumulated (such as holders) or processed (tar separators). The manufacturing of coal gas potentially produced phenols which may be associated with sources where tar was accumulated. PAHs are also associated with oils. Trace metals and SVOCs may be associated with coal or coke storage areas or fill material containing coal fines, ash or clinkers. Cyanides are often associated with purifier operations.

### 2.5.1 Potential Sources on the Former MGP Facility

Former MGP structures with remaining subsurface remnants were identified during the CSI. The structures and associated sampling points are indicated on Figure 3 and are described below. As-built construction diagrams are not available.

- **Gas Holder No. 1** — This structure is located at the southwest corner of the warehouse between the warehouse and the pole storage rack. Gas Holder No. 1 was decommissioned prior to 1908 and was abandoned by 1924 according to the Sanborn Fire Insurance maps. The Sanborn Fire Insurance map indicates that the gas holder was 40 feet in diameter with a capacity of 40,000 gallons. Samples were described from four soil borings performed within the structure during the CSI (SB-9 through SB-11, and SB-39). Probe refusal was encountered from 12 to 13 feet below ground surface (bgs). Additional borings (no IDs) were performed to locate the extent of the foundation which was marked on the surface and surveyed. Coal-like material (CLM) and slag-like material (SLM) were observed within the structure and a small quantity (less than one-inch lens) of oil-like material (OLM), and tar-like material (TLM) were observed at the base of two of the borings (SB-11 and SB-39). Boring logs are included in Appendix D.
- **Gas Holder No. 2** — This structure is located east of the current canopied equipment storage area and warehouse and was used at one time to store the final gas product. According to the Sanborn Fire Insurance maps the structure was decommissioned and abandoned around the same time as Gas Holder No. 1. The Sanborn Fire Insurance maps indicate that the gas holder was 60 feet in diameter with a capacity of 60,000 gallons. Based on historical aerial photographs and current Site conditions, the Gas Holder was backfilled prior to 1938 and additional fill was later placed over the structure. The holder was identified in the field by several soil borings. Samples were described from four soil borings performed within the structure during the CSI (SB-12 through SB-15). Additional soil borings (no IDs) were performed to delineate the extent of

the foundation of Gas Holder No. 2. The extent was marked on the surface and later surveyed. Probe refusal was encountered within the holder from 38 to 41 feet bgs. Coal-like material, SLM, OLM, and TLM were observed in borings performed in the structure (see boring logs in Appendix D). The OLM and TLM were observed at the very base of the structure in a highly viscous, black, tarry layer of no more than one inch in thickness.

- **Purifying Room/Condensers/Motor Room** — According to the Sanborn Fire Insurance maps from 1889, 1895, and 1908, this building was near the intersection of Willow Street and Spring Street Lane and would have been located at the southwest corner of the warehouse currently on the property and extending to Willow Street. Two soil borings (SB-19 and SB-20) were advanced in the general vicinity of this building to assess the potential release of COI from this structure.
- **Oil Tanks** — The 1889 Sanborn Fire Insurance map indicates the presence of two 8,000-gallon underground oil tanks that were located northwest of Gas Holder No. 2. Based on current property conditions, the oil tanks would have been located on the northeast and northwest corners of the current warehouse. Two soil borings (SB-16 and SB-17) were advanced between the warehouse and the maintenance shop to assess the potential release of COI from the oil tanks.

All of the potential sources listed could have contributed to the release of regulated substances but it is not known if each potential source actually was a contributor. A biased sampling approach was used during the CSI to address all known potential source areas. Continuous sampling combined with field-screening methods were employed to identify impacted strata. The sampling approach is discussed more fully in Section 4.

In addition to the former MGP structures, fill material used to develop the property and surrounding properties may be a potential source of regulated substances. The former MGP facility and surrounding properties were backfilled on several occasions to reach the current topography. Fill thickness ranges from 4.5 feet to the west of the former MGP facility to approximately 36 feet on the eastern portion and to the southeast of the former MGP facility. The fill material consists of silts, sands, and clays consistent with the area lithology and construction debris including brick, concrete, glass and asphalt. Fill material within the former MGP property boundaries and fill material beyond the former MGP property boundaries appears to be from similar sources based on visual observation.

### **2.5.2 Database Search**

A database search was performed prior to the CSI to determine the presence of facilities listed on environmental databases in the area surrounding the former Macon 2 MGP property. A report provided by Environmental Data Resources Inc. (EDR), at the request of Williams, included a listing of such facilities within a one-eighth mile, one-quarter mile, one-half mile, and in some instances a one-mile radius of the former MGP facility. The search was centered from the intersection of Spring Street Lane and Willow Street, which is the approximate location of the target property.

Facilities listed within a one-eighth mile radius of the former MGP Site include five sites found on both the Leaking Underground Storage Tank (LUST) and Underground Storage Tank (UST) databases. These facilities include Conoco #10045 (Jet #10045, EDR Report), located west-northwest of the property; Greyhound Bus Terminal, located west-southwest of the property; BP/Bucks Service Station located west-southwest of the property; Spring and Riverside Exxon (former Chevron Fac ID 40452), located southwest of the property; and the Macon-Bibb County Transit Authority, located south of the property. Morgan Tire and Auto Incorporated and Spectrum #76 are also found within one-eighth mile of the property and are listed on the LUST and UST databases, respectively.

Facilities located between one-eighth and one-quarter mile from the former MGP facility include Nationwide Printing Corporation, found on the Resource Conservation and Recovery Information Systems-Small Quantity Generator (RCRIS-SQG) list. This list includes sites that generate, store, treat or dispose of hazardous waste as defined by the RCRA. This facility is located west-southwest of the Site. Three UST sites (WC&M Incorporated, Land-O-Sun, and the Radisson Hotel-Macon) and one Georgia Non-hazardous Site Inventory site (Riverside Drive Property) are also located between one-eighth and one-quarter mile from the former MGP facility.

Facilities listed on environmental databases within one-quarter and one-half mile of the Macon 2 former MGP facility include four LUST sites: the Downtown Chevron Service Center, located south of the property; AT&T, located west-southwest of the property; BST/Macon Main/R2110, located south-southwest of the property; and Paul's Fina/Paul's Service, located northeast of the property.

The Macon 1 former MGP Site, located south-southeast of the property, was listed in the Georgia State Hazardous Waste Sites records (the state's equivalent to the U. S. EPA's Comprehensive Environmental Response, Compensation and Liability Information System) and EDR's proprietary database Former Manufactured Gas (Coal Gas) Sites. This site is found within a one-half and one-mile radius of the Macon 2 former MGP facility. Also listed on the Former Manufactured Gas (Coal Gas) Sites database is the Macon 2 MGP property itself. A copy of EDR's report is included in Appendix E.

Based on information presented in EDR's database search report and a Site reconnaissance by Williams, Kemron Environmental Services (Kemron), at the request of Georgia Power, conducted a technical file review of surrounding facilities with the greatest potential of impacting the Macon 2 former MGP property. File reviews were conducted on six facilities listed in LUST and UST databases and include Spring and Riverside Exxon (Fac ID 9000192; former Chevron Fac ID 40452), Greyhound Bus Terminal (Fac ID 4110182); Conoco #10045 (JET #10045, EDR Report; Fac ID 4110086), BP/Buck's Service Station (Fac ID 4110275), Macon-Bibb Transit Authority (Fac ID 9011141), and Spectrum #76 (Fac ID 4110210). A summary of each file review follows.

Spring and Riverside Exxon (Fac ID 9000192; former Chevron Fac ID 40452), located at 893 Riverside Drive, registered five USTs in March 1986. The USTs consisted of two 10,000-gallon gasoline USTs, two 3,000-gallon gasoline USTs and one 550-gallon used oil UST. On February 2, 1989, a suspected release was reported due to gasoline vapors in the soil and groundwater. A Phase II Environmental Site Assessment was conducted and a report submitted to EPD in February 1989. Four groundwater monitoring wells were installed and sampled during the site assessment. The

maximum benzene concentration in groundwater was reported at 24,503 µg/L and total benzene, toluene, ethyl-benzene, and total xylenes (BTEX) was reported at 238,393 ug/L, indicative of free phase product. A "trace" amount of free phase product was found on the water table at the site. Groundwater flow was radial to the northeast, east and southeast.

Remedial activities at the Spring and Riverside Exxon included the removal of all UST system components and 200 tons of soil in March 1989. A new facility was constructed in August 1989 and a soil venting pilot study was conducted in October 1989 removing 1,212 pounds of volatile organic compounds (VOCs) from the soil. A Confirmatory Soil Sampling Report received by EPD on August 26, 1991, reported total petroleum hydrocarbons (TPH) and BTEX levels at 1,460 mg/Kg and 218 mg/Kg respectively, both above Corrective Action Plan (CAP) objectives. Reinstallation of the soil vapor extraction system was proposed. A letter dated January 27, 1994, was received by the EPD from the law offices of Anderson, Walker and Reichert, who were writing on behalf of the City of Macon. The letter suggests the City's property (Macon 2 former MGP property) may have been impacted by a release originating from the former Chevron property. An up-gradient baseline monitoring well placed on the City's property adjacent to the former Chevron property contained 1,300 ug/L benzene. Based on the location of the well and the direction of groundwater flow in the area, the letter concludes the former Chevron tanks may have been the source of contamination. A CAP Part A was received by EPD on January 9, 1996, but has not yet been reviewed. Additional wells, including a deep well, were installed in 1994. A CAP Part B is proposed by Chevron along with three additional wells. The site has not been delineated and remains a candidate for impacting the Macon 2 former MGP property.

The Greyhound Bus Terminal (Facility ID 4110182) registered one 10,000-gallon diesel UST in April 1986. In April of 1992, a TPH concentration of 9,100 mg/Kg was reported from a soil sample taken from the piping trench. Three wells were installed and sampled. The maximum BTEX concentration in soil was 0.297 mg/Kg. The maximum TPH concentration in soil was 77 mg/Kg. The maximum benzene concentration found in groundwater was 8,100 ug/L. Due to the high concentration of benzene and given the fact the Greyhound Bus Terminal never operated a gasoline UST, the contamination was concluded to be from another source. A Site Characterization Report (prepared by Engineering-Science, Inc.) including this information was received in August 1992. The UST was removed in January 1992. Subsequent monitoring events were conducted and reports submitted to the EPD to solidify the argument that benzene contamination was from an up-gradient petroleum source. No free phase product was found. EPD issued a letter on June 24, 1994, indicating no further action required. Monitoring wells used in the diesel UST investigation have been decommissioned.

Conoco #10045 (Facility ID 4110086; Jet #10045, EDR Report) reported a release in October 1995 due to a failed line tightness test. EPD requested a site check on October 27, 1995. The leak was verified and soil samples were collected. A CAP Part A was received by the EPD on October 26, 1996. A CAP Part B was received August 4, 1997. The maximum concentration of benzene in groundwater was reported as 2,000 ug/L and a model was prepared to justify an alternative concentration level (ACL) of over 20,000 ug/L. Remediation by natural attenuation with annual monitoring was proposed. A Groundwater Monitoring report received by the EPD in May 1999 reported maximum concentrations of benzene in groundwater at 970 ug/L. Groundwater flow at the site was determined to be east-northeast. Two additional wells were installed down gradient to achieve delineation. Free product has been measured

several times in the well on that site designated MW-1. High vacuum recovery was approved by the EPD on January 10, 2001, to recover the free phase product. Monitoring wells near the site boundary show minimal impact; however, the contaminant plume has the potential to impact the northeast corner of the Macon 2 Former MGP property.

BP/Buck's Service Station (Facility ID 4110275) issued an Initial Site Characterization Report to the EPD on June 8, 1993. Three 8,000-gallon USTs and one 4,000-gallon UST were reported on site. Seven soil borings were installed with one sample containing detectable benzene at 1.5 mg/Kg. Benzene concentrations in groundwater were found at 24,543 ug/L and total BTEX concentrations were indicative of free phase product. EPD requested a CAP on July 26, 1993. A UST Closure Assessment Report was received by the EPD November 30, 1993. Seven tanks were closed and fourteen soil samples were collected. The highest detected total BTEX concentration was 467 mg/Kg in the soil samples. A total of 470 tons of contaminated soil were disposed of. EPD requested a CAP part A which was received in March of 1998. No free product was found at that time. The maximum benzene concentration in groundwater was 3,240 ug/L. Semi-annual monitoring was proposed. A CAP Part B is pending. This site is considered a candidate for a potential source of contamination at the Macon 2 facility; however, the groundwater flow is not directly towards the Site. Free product has recently (June 2000) been discovered in one of the wells.

Macon-Bibb County Transit Authority (Fac ID 9011141) submitted a UST Closure Report that was received by the EPD on February 10, 2000. The submittal reported the results of the closure of two 12,000-gallon diesel USTs and one 300-gallon waste oil UST. TPH and BTEX were found in several soil samples and some results exceeded applicable soil threshold levels (STLs). The maximum BTEX and TPH concentrations in the soil were reported at 11.32 mg/Kg and 480 mg/Kg, respectively. EPD requested a CAP Part A on April 10, 2000. On July 21, 2000, a letter submitted by Dobbs Environmental was received by the EPD requesting no further action. Subsequently, an additional soil boring was installed to the top of bedrock (groundwater was not encountered). The sample collected just above the bedrock contained a concentration of 0.83 mg/Kg benzene.

Spectrum #76 (Fac ID 4110210) does not appear to be a potential source of impacts to the Macon 2 Site. A Closure Report was received by EPD on January 6, 1997, after one 1,000-gallon UST was removed in November 1996. Piping was replaced to six active tanks and a report was submitted on January 28, 1998. BTEX, gasoline range organics (GRO), diesel range organics (DRO), and PAHs were all below detectable limits. A "No Further Action Requested" status was issued by the EPD on June 5, 1998. No release has been reported.

### **2.5.3 Surrounding Land Use**

According to Sanborn Fire Insurance maps the area surrounding the former MGP facility has been historically developed for commercial, industrial and residential purposes. The properties located immediately northwest of the facility, northwest across Willow Street, and west and south across Willow Street were listed as a residential (dwellings) from 1889 through 1924. Properties to the north and east were not depicted on the Sanborn maps until 1924 which shows the Norfolk Southern Railway and Ocmulgee River running on the east side of the facility. The Bibb Transit Company, a filling station, and a Baptist church occupied the property to the south by 1951. The church property was a paint shop and office in 1960 and a radio station and paint shop in 1969. Properties to the northwest and west remained

residential until at least 1960. By 1960 a plate glass company occupied the property the south of the facility across Riverside Drive on the corner of New Street and Riverside Drive. The 1969 Sanborn map shows that a restaurant and filling station occupied part of the property to the west and northwest and a filling station occupied the property immediately northwest of the facility.

Currently, the property south of the former MGP facility is occupied by the City of Macon Transit Authority Bus Garage. West of the facility is a fast food establishment, restaurant, and filling station. Another filling station is located northwest of the facility. The Norfolk Southern Railway and Ocmulgee River bound the property to the east.

**SECTION 3**  
**SCOPE OF COMPLIANCE STATUS**  
**INVESTIGATION AND ENVIRONMENTAL**  
**SETTING**

## **SECTION 3**

# **SCOPE OF COMPLIANCE STATUS INVESTIGATION AND ENVIRONMENTAL SETTING**

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### **3.1 GENERAL SCOPE OF COMPLIANCE STATUS INVESTIGATION**

The CSI field work was performed from February 2001 to May 2001 with a second event occurring in August 2003. The primary objective of the investigation was to define the horizontal and vertical extent of COI related to the former MGP operations in soil and groundwater. Other tasks included determining the presence of potential NAPL in source structures, aquifer characterization, physical testing of soil samples, collection of corrective action feasibility information, characterization of material in source areas for possible remedial alternatives, a Site survey, and an evaluation of sediments in the Ocmulgee River. Soil samples were collected for analysis from a total of 35 soil borings performed during the CSI. Three monitoring wells were installed during the CSI, and groundwater samples were collected for analysis from a total of seven monitoring wells (including four installed by LAW during the SI). In addition, 21 sediment borings were performed in the Ocmulgee River during the CSI for visual observation of potential impact from former MGP operations. Sediment samples were not analyzed and sediment sample locations were not surveyed during the CSI. After completion of the investigation, a Site survey, including new soil borings and wells and property boundaries, was performed by a surveyor certified by the State of Georgia (Donaldson, Garrett, & Associates, Inc.). Williams performed the survey during the August 2003 field event.

### **3.2 ENVIRONMENTAL SETTING**

#### **3.2.1 Regional Geology and Hydrogeology**

The southern part of Macon, Bibb County, Georgia, is located in the Atlantic Coastal Plain Physiographic province and the northern part is in the Piedmont province. The Fall Line is defined as an arbitrary line that separates the two physiographic regions and is why this region is sometimes referred to as the Fall Line District. The Coastal Plain province in Bibb County is characterized by distinctive light-colored sandy hills of Cretaceous age that slope gently towards the southeast. The Piedmont province is characterized by a rolling to hilly upland area of moderate relief that slopes gently to the south.

The former Macon 2 MGP facility is located in the vicinity of the Fall Line between the Atlantic Coastal Plain and the Piedmont Province, approximately 200 feet southwest of the Ocmulgee River. Elevations in the investigation area range from approximately 300 to 320 feet above mean sea level (USGS Topographic Map Macon West and Macon East, Georgia; Figure 1). The area is underlain by Pleistocene- to recent-age alluvial deposits up to 40 feet thick. These alluvial deposits are described as unsorted sand, gravel and clay (LeGrand, 1962). Below the alluvial deposits, the Late Eocene upper sand member of the Barnwell Formation, if present, lies unconformably above the Cretaceous-age Tuscaloosa Formation, if present. The upper sand of the Barnwell Formation is described as a deep red clayey sand (LeGrand and others, 1956). The Tuscaloosa Formation consists of fine to coarse, subangular, micaceous, arkosic sands that are interbedded with gray to green, locally iron-stained kaolinitic, micaceous sandy clays (Herrick and Vorhis,

1963). The base of the Tuscaloosa in this area dips slightly to the southeast at approximately 30 feet per mile and lies unconformably above the much older crystalline rocks below. The Paleozoic and older igneous and metamorphic rocks lie at a depth of approximately 50 feet bgs (LeGrand, 1962).

According to the City of Macon Water Department, the Ocmulgee River is the only source of drinking water in the Macon water system. The intake is located on the Ocmulgee River approximately three miles upstream from the former Macon 2 MGP facility (Figure 5). Towards the south and west there is an increase in well usage; the Tuscaloosa sands gradually increase in thickness allowing for more availability of water from wells. Recharge to the Tuscaloosa occurs in outcrop areas west of the Ocmulgee River. Natural discharge from the Tuscaloosa is into the Flint and Ocmulgee Rivers and smaller streams crossing the outcrop area (Pollard and Vorhis, 1980).

### **3.2.2 Site Geology**

The geology encountered during the CSI consisted of unconsolidated alluvial clays, sands, gravels, and clays, saprolite (a clayey silt to fine sand), and a mafic to felsic gneiss bedrock (Figure 6). Cross sections A-A' through C-C' (Figures 7, 8, and 9) were prepared to illustrate the Site geology. Fill material consisting of sand, silt, clay, gravel, construction debris and asphalt was encountered from the ground surface to depths ranging from approximately 0.5 to 36 feet bgs. The fill material is thicker on the northern and eastern portions of the Site, where the 20 foot embankment was previously located (see 1889 Sanborn Fire Insurance map). Underlying the fill material across most of the Site is an alluvial deposit that consists primarily of micaceous silts and clays with some fine to coarse sand and gravel in scattered lenses. The alluvium also contains some deposited organic matter such as leaves and wood fragments. Alluvium was not encountered in borings installed to the south and southwest of the property or on the southwest corner of the property in the vicinity of Gas Holder No. 1. The alluvial deposit, where encountered, ranges in thickness from 5 to 35 feet at the Site and is encountered at the surface in borings (SB-30 through SB-31) installed along the west side of the Ocmulgee River. The alluvial deposit lies unconformably above the saprolite. The saprolite in the area of the Site is generally a micaceous silt and very fine sand that is characterized by relic foliation and other structures associated with igneous and metamorphic rock. Saprolite was encountered at depths ranging from 4.5 feet (in SB-36, located southwest of the former MGP property) to 61 feet bgs. The depth at which saprolite is encountered increases towards the river and was not observed to a total depth of 64 feet in boring SB-43 located southeast of the former MGP property. Where encountered, the thickness of the saprolite ranges from a few inches to four feet thick and is thickest on the south and southwest portions of the Site. The underlying bedrock consists of a mafic to felsic gneiss and, where encountered, ranges in depth from six feet to 62 feet bgs. The bedrock appears to slope to the east and northeast of the Site towards the Ocmulgee River.

### **3.2.3 Site Hydrology and Hydrogeology**

Figure 5 (Site Map and Surface/Storm Water Flow Path) identifies the flow paths of surface water at the Site and surrounding areas. Storm water at the former MGP property flows to various storm drains located at the facility (Figure 3) or as a sheet flow over the embankment located on the eastern boundary of the property. Storm water that flows

towards the embankment accumulates in standing pools on the western side of the Norfolk Southern Railway and eventually seeps through the railway gravel bed and to the Ocmulgee River. Stormwater which falls on up-gradient properties including the Exxon station, Pizza Hut restaurant, Burger King restaurant, and Conoco station, flows into either storm drains that feed into storm drains located at the facility, as surface flow over the embankment previously mentioned, or into a drainage located on the southwestern side of the Spring Street bridge. Storm water that flows into the drainage located on the southwestern side of the Spring Street bridge empties into the Ocmulgee River at a point on the southeastern side of the bridge (Figure 5).

Hydrogeology at the Site was evaluated by the use of seven monitoring wells (this includes four installed during the SI and three installed during the CSI). The uppermost portion of the surficial aquifer is located in fill material across the Site. Cross-sections A-A', B-B', and C-C' (Figures 7, 8, and 9) indicate the relationship of the top of groundwater with geologic units at the Site. Monitoring well MW-1 is screened within the saprolite and monitoring wells MW-2 through MW-5 and MW-7 are all screened within the fill material with some extending into the alluvium. Monitoring well MW-6 is screened within the alluvium. The fill material consists of clays and silty clays with abundant debris including concrete, brick, and asphalt. The matrix of the fill material does not appear very porous; however, due to the abundance of debris that creates void spaces within the fill material, wells screened within the fill material exhibited high conductivity values (see Section 5.1.1.2). The base of the alluvium in locations of the eastern area of the Site contains an alluvial clay which in some areas lies directly above the saprolite; this and the underlying saprolite appear to serve as an aquitard consisting of clays, silty clays, and clayey silts. A mafic to felsic gneiss bedrock underlies the saprolite. Based on water level measurements obtained on August 20, 2003, the top of the water table ranges from 7.32 (MW-01) to 22.75 feet bgs (MW-04). Water level measurements obtained from MW-06 were not used in determining the water table elevations due to the fact that it is screened below the top of groundwater. In addition, the proximity of MW-04 to MW-06 and their relative water levels indicate a downward flow gradient with the upper water bearing zone (see Section 5.2.3). Groundwater under the former MGP facility has a horizontal flow to the east and northeast. Three surface water bodies are located near the facility. The first is a drainage ditch located to the northwest of the former MGP property that feeds into the Ocmulgee River in the vicinity of the Spring Street bridge. Another drainage ditch is located approximately 130 feet southeast of the former MGP property and feeds into a drainage on the west side of the Norfolk Southern Railway. Based on field observations made during a period of heavy rainfall, the railway drainage has no obvious flow direction but most likely seeps through the railroad base material and into the Ocmulgee River. The third is the Ocmulgee River which is located approximately 250 feet to the east/northeast of the facility and appears to be a gaining water body.

**SECTION 4**  
**SOIL INVESTIGATION**

# SECTION 4

## SOIL INVESTIGATION

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### 4.1 GENERAL APPROACH AND RATIONALE

Soil samples were collected at various locations to define the extent of the COI related to the former MGP operations, determine background concentrations, and evaluate potential pathways for migration of the COI. The majority of soil samples collected from soil borings performed during the CSI field work were obtained with direct-push technology (DPT) samplers equipped with liners. Where DPT was not feasible, soil samples were collected by either split-spoon samplers used in conjunction with hollow-stem augering (HSA) techniques or with hand-driven DPT.

A general sampling rationale was developed in the Work Plan (Williams, 2001) to select soil samples for laboratory analysis from geologic unit contacts and subsurface key horizons where the COI could potentially migrate. During the CSI, soil samples were field-screened to aid in the selection of soil samples for off-site laboratory analysis. Continuous sampling on four- to five-foot intervals (with two-foot, four-foot, and five-foot sampling spoons) was attempted to ensure that adequate soil samples were obtained at and between the key horizons. Field-screening using closed headspace procedures with a photoionization detector (PID) was used to determine if samples potentially contained volatile organic compounds.

Samples from the following intervals were analyzed for COI at most locations advanced:

- 0 to 2 feet bgs;
- Base of the fill;
- Top of the groundwater;
- Base of the alluvium;
- Deepest interval; and
- The soil sample with the highest PID reading.

The water table encountered during the CSI within soil borings ranged from approximately eight feet to approximately 26 feet bgs. Soil samples collected in some locations intersected the water table. If a soil sample was <50% saturated, the interval was considered part of the vadose (unsaturated) zone. If a soil sample exhibited >50% saturation, the sample was considered to be from the saturated zone.

### 4.2 SAMPLING AND ANALYSIS METHODS

#### 4.2.1 Sampling Methods

Direct-push technology sampling methods were utilized to collect the majority of the soil samples to minimize CSI-derived waste. The method also allows sampling of discrete intervals with minimal interference from flowing sands and/or cave-ins that sometimes occur during augering operations. The method involves pushing a closed two-, three-, or

four-foot sampling spoon with a liner to the desired depth, unlocking the spoon tip, and pushing the spoon through the sampling interval.

Hollow-stem augering techniques in conjunction with split-spoon sampling were utilized to advance selected borings where DPT was limited by depth. In those borings, five-foot long split-spoons were advanced with the augers for sample collection and description.

The soil borings installed during the CSI were labeled with the prefix "SB" followed by the appropriate sample location number. Some soil borings were denoted with the suffix "B" to denote a soil boring adjacent to previous soil boring locations advanced during the CSI. The locations of soil borings are shown on Figure 3.

A boring log was maintained for each soil boring installed during the CSI. Each log contains general Site information and specific information about each boring including: date sampled, sampling method, sampler, sample identification number, sample interval, time sampled, moisture content, field-screening, a complete lithologic description, and comments. Boring logs are included in Appendix D.

Soil samples were collected according to the general rationale described in this section and according to the CSI Work Plan (Williams, 2001). During field sampling, the center portion of the sample interval was collected for field-screening with a PID. Field-screening samples were placed into sealable plastic bags. A portion of the center of the interval was also collected for possible laboratory analysis of volatile organic compounds (VOCs). Each VOC sample was collected in a 4-ounce glass jar for analysis of percent solids and high-level VOCs and two five-gram aliquots of soil were also placed into two pre-weighed vials containing a five-milliliter solution of sodium bisulfate for low-level analysis of VOCs. Samples for VOC analysis and field-screening were not homogenized before they were placed into the appropriate containers. Samples for possible analysis of SVOCs and inorganics were collected over the entire interval, thoroughly homogenized on heavy duty aluminum foil (on glass during the August 2003 sampling event), and placed in laboratory-provided containers.

Sample jars filled for possible laboratory analysis were immediately labeled, placed into sealable plastic bags, and stored on ice in a cooler. Samples for field-screening were labeled and allowed to warm in the sun for a minimum of 30 minutes to allow the volatilization of organic compounds.

One soil sample containing potential OLM (GH-2-41) was collected from the base of Gas Holder No. 2 for analysis of VOCs, SVOCs, synthetic precipitation leachability procedure (SPLP) VOCs and SPLP SVOCs. This sample was collected in a 4-ounce glass jar, placed in a sealable plastic bag and stored on ice in a separate cooler to prevent cross contamination to other soil samples. This sample was shipped under chain-of-custody as part of a SDG.

Four soil samples indicated elevated lead concentrations (above the Type 3 Risk Reduction Standard of 400 mg/Kg). Upon receipt of the analytical results, three of these samples were also run for SPLP lead to determine the potential for the lead to leach into groundwater above RRSs.

Four undisturbed (UD) soil samples were collected during the CSI with Shelby tube samplers using HSA techniques for the analysis of physical characteristics of the soil (Section 5.2).

Following completion of the CSI field work, surveys were performed by a surveyor certified by the State of Georgia (Donaldson, Garrett, & Associates, Inc.) to locate the soil borings (soil borings performed in August 2003 were surveyed by Williams). The surveys were tied into the previous Site survey conducted during the SI.

#### **4.2.2 Field Screening**

Field-screening performed during the CSI was conducted utilizing closed headspace procedures by placing a portion of the sample into a sealable plastic bag. The sample was placed in the sun and allowed to warm. After sufficient time was allowed for organic compounds to volatilize (a minimum of 30 minutes), the sample was screened with a PID. The PID probe tip was inserted through the bag opening into the headspace of each container and the maximum reading was recorded. The PID was calibrated at the beginning and end of each day of use with isobutylene and zero gas. The PID reading of each sample is noted on the boring logs (Appendix D).

#### **4.2.3 Sample Handling and Preservation Techniques**

Soil samples collected during the CSI were placed in ice-filled coolers which were temporarily stored in a locked office until a determination of samples to be analyzed was made. Soil samples selected for laboratory analysis were recorded on chain-of-custody forms. Those samples selected for analysis were organized into sample delivery groups (SDGs) which were secured in ice-filled coolers and shipped or couriered to Analytical Environmental Services, Inc. (AES) in Atlanta, Georgia for analysis. Chain-of-custody documents accompanied each shipment. In general, a trip blank, field blank, rinsate, and duplicate sample were included with each SDG. One rinsate sample was collected each day or for each SDG from decontaminated or new sampling equipment. A sample was collected from the potable water supply used for decontamination procedures for analysis for the COI. The results of analysis of QA/QC samples are summarized in Appendix F.

#### **4.2.4 Decontamination Procedures**

Nondisposable sampling equipment was decontaminated before and between each sample by washing with phosphate-free detergent and water and rinsing with tap water, deionized water, isopropanol, and organic-free water. Equipment transported to a sampling point from the decontamination area was wrapped in aluminum foil. Large equipment, such as the drilling rig and ancillary tools, was decontaminated at the beginning of each day and between boreholes. Decontamination water was collected and placed into a wastewater tank and/or drums on the City of Macon property until it could be characterized for disposal.

#### **4.2.5 Laboratory Methods**

Analyses were performed according to current approved EPA methods. Volatile organic compounds were analyzed using SW-846 Method 8260 and SVOCs were analyzed using SW-846 Method 8270A. Soil samples collected for VOC analysis during CSI field work were collected and analyzed using the up-dated SW-846 Method 5035. Most inorganic compounds were analyzed using SW-846 Method 6010 except mercury (SW-846 Method 7471) and total cyanide (SW-846 Method 9010A). The Contract Required Quantitation Limit (CRQL) for each compound was based on

the laboratory's self-determined Practical Quantitation Limit (PQL). Summaries of analytical data for the CSI are contained in Appendix C-2. Attachment A of this CSR contains copies of analytical data collected during the CSI.

A complete Contract Laboratory Program (CLP) like data package was prepared by AES for one SDG containing soil samples collected during the CSI. The data package was submitted to Southern Company Chemical Services, Norcross, Georgia, for data validation using USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 1994, and Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 1994. Southern Company Chemical Services indicated that all laboratory data for the soil samples were acceptable. Southern Company Chemical Services also reviewed the laboratory data for precision, accuracy, representativeness, compatibility and completeness (PARCC) parameters. Southern Company Chemical Services found the PARCC parameters acceptable. A copy of Southern Company Chemical Services' report is included in Appendix G-1. Laboratory reports for other SDGs were reviewed by Williams for QA/QC measurements and the Williams QA/QC reports are included in Appendix G-2.

#### **4.3 BACKGROUND CONCENTRATION STUDY**

The lithology beneath the Site was divided into two units (fill material and natural soils) for the purpose of establishing upper-background limits (UBLs) and delineation. The background study included the collection of soil samples from areas topographically and hydrogeologically up-gradient or cross-gradient from the former MGP facility operations. Background borings included SB-33, SB-34, SB-36, SB-38, SB-38B, and SB-43. The data set for the fill material UBLs include 25 samples and 23 samples composed the data set for the natural soils. Table 4.1 lists the calculated UBLs for the COI with respect to units. Background concentrations for VOCs are determined to be the detection limit.

The background soil data were statistically evaluated to determine the UBL for each analyte for each unit. A flow-chart for the method described below is presented in Figure 10. First, the data were evaluated to determine the percentage of detected values. If the percentage of detects was less than 85 percent and the data set contained at least one detected value, a Nonparametric UBL was calculated. The Nonparametric UBL equaled the greatest detected value. If there were no detected values, the UBL was determined to be the detection limit.

If the percentage of detects was 85 percent or more, nondetect values were substituted with one-half the detection limit. Next, the underlying distributional assumption was tested using the Shapiro-Wilk Test. Then, the data was tested for outliers by calculating the 99% confidence outlier value. If a value in the data set was greater than the 99% confidence outlier value, an outlier was suspected. To be conservative, suspect outliers were removed from the initial run. If the data were determined, by the Shapiro-Wilk Test, to be normally distributed with no outliers, the UBL was calculated as the mean plus two standard deviations. If the data set was determined not to be normally distributed with no outliers, a Nonparametric UBL was calculated. If the original data set was determined to contain a suspect outlier, the outlier was removed and the modified data set was re-evaluated. If the modified data set contained another suspect

outlier and/or was not normally distributed, a Nonparametric UBL was determined based on the modified data set. The data set and calculations for background concentrations are detailed in Appendix H.

#### 4.4 HORIZONTAL EXTENT OF CONSTITUENTS OF INTEREST IN SOILS

Cross-sections A-A' through C-C' (Figures 7 through 9) depict the relationship of the COI distribution to the Site soils and show the horizontal and vertical extent of the COI as well as visual identification of TLM and OLM in soil intervals. Visual identification of TLM and OLM in soil is also noted in plan view on Figure 11. Isoconcentration maps (Figures 12 through 17) were prepared for various COI in soil. Data from the CSI and the SI were used in the evaluation of the extent of the COI in soil. Analytical results of the COI for all soil samples collected during the SI and CSI are summarized in Appendix B-1 and Appendix B-2, respectively.

Samples from background borings which exceeded calculated background concentrations were not included in the contours (except for the VOCs delineation) since, by definition, they are background samples. A background calculation based on the mean plus two standard deviations corresponds to a 97.7% confidence level of the distribution. Therefore, it is expected that a portion of the background samples will exceed the calculated background levels. For data sets of these sizes, it is typical that one sample will exceed the UBL. Additionally, to be conservative, suspect outliers from the UBL data set were removed for calculations of UBLs.

TABLE 4.1  
CALCULATED BACKGROUND CONCENTRATIONS IN SOIL

FILL MATERIAL				
SVOCs				
ANALYTE	RANGE (mg/Kg)	%NONDETECTS	STATISTICAL METHOD	UPPER BACKGROUND LIMIT (mg/Kg)
Acenaphthene	<0.35 - <0.40	0%	Detection Limit	DL
Acenaphthylene	<0.35 - <0.40	0%	Detection Limit	DL
Anthracene	<0.35 - <0.40	0%	Detection Limit	DL
Benzo(a)anthracene	<0.35 - 0.56	25%	Nonparametric 85% Prediction Limit	0.56
Benzo(a)pyrene	<0.35 - 0.69	25%	Nonparametric 85% Prediction Limit	0.69
Benzo(b)fluoranthene	<0.35 - 0.61	33%	Nonparametric 85% Prediction Limit	0.61
Benzo(g,h,i)pyrene	<0.35 - 0.69	17%	Nonparametric 85% Prediction Limit	0.69
Benzo(k)fluoranthene	<0.35 - 0.57	17%	Nonparametric 85% Prediction Limit	0.57
Chrysene	<0.35 - 0.68	25%	Nonparametric 85% Prediction Limit	0.68
Dibenzo(a,h)anthracene	<0.35 - <0.40	0%	Detection Limit	DL
Fluoranthene	<0.35 - 0.12	42%	Nonparametric 85% Prediction Limit	1.2
Fluorene	<0.35 - <0.40	0%	Detection Limit	DL
Indeno(1,2,3-cd)pyrene	<0.35 - 0.58	17%	Nonparametric 85% Prediction Limit	0.58
Naphthalene	<0.35 - <0.40	0%	Detection Limit	DL
Phenanthrene	<0.35 - 0.56	33%	Nonparametric 85% Prediction Limit	0.56
Phenol	<0.35 - <0.40	0%	Detection Limit	DL
Pyrene	<0.35 - 0.92	42%	Nonparametric 85% Prediction Limit	0.92

**TABLE 4.1 (CONTINUED)  
CALCULATED BACKGROUND CONCENTRATIONS IN SOIL**

<b>FILL MATERIAL</b>				
<b>INORGANICS</b>				
<b>ANALYTE</b>	<b>RANGE (mg/Kg)</b>	<b>% NONDETECTS</b>	<b>STATISTICAL METHOD</b>	<b>UPPER BACKGROUND LIMIT (mg/Kg)</b>
Arsenic (As)	<2.98 - 7.05	8%	Nonparametric 85% Prediction Limit	7.05
Barium (Ba)	11.1 - 126	100%	Mean + 2 SDs	115
Beryllium (Be)	<1.49 - <3.04	0%	Detection Limit	DL
Cadmium (Cd)	<1.49 - <3.04	0%	Detection Limit	DL
Chromium (Cr)	7.01 - 46.3*	100%	Nonparametric 85% Prediction Limit (Outlier Removed)	28.7
Copper (Cu)	5.54 - 74.9*	100%	Nonparametric 85% Prediction Limit (Outlier Removed)	43.4
Lead (Pb)	<5.67 - 379*	96%	Mean + 2 SDs (Outlier Removed)	204
Mercury (Hg)	<0.0938 - 0.541	80%	Nonparametric 85% Prediction Limit	0.541
Nickel (Ni)	3.10 - 14.4	28%	Nonparametric 85% Prediction Limit	14.4
Vanadium (V)	14.0 - 79.3*	100%	Nonparametric 85% Prediction Limit (Outlier Removed)	58.9
Zinc (Zn)	6.33 - 339*	100%	Nonparametric 85% Prediction Limit (Outlier Removed)	257
Cyanide (CN)	<0.678 - <1.22	0%	Detection Limit	DL
<b>NATURAL SOILS</b>				
<b>INORGANICS</b>				
<b>ANALYTE</b>	<b>RANGE (mg/Kg)</b>	<b>% NONDETECTS</b>	<b>STATISTICAL METHOD</b>	<b>UPPER BACKGROUND LIMIT (mg/Kg)</b>
Arsenic (As)	<3.77 - <10.5	0%	Detection Limit	DL
Barium (Ba)	<5.04 - 338	87%	Mean + 2 SDs	275
Beryllium (Be)	<1.88 - <5.27	0%	Detection Limit	DL
Cadmium (Cd)	<1.88 - <5.77	0%	Detection Limit	DL
Chromium	< 2.52 - 87.2*	96%	Mean + 2 SDs (Outlier Removed)	52.8
Copper	< 2.52 - 45.5	87%	Mean + 2 SDs	35.7
Lead	< 4.94 - 26.5	65%	Nonparametric 85% Prediction Limit	26.5
Mercury (Hg)	<0.101 - <0.237	0%	Detection Limit	DL
Nickel (Ni)	<5.04 - 29.7	70%	Nonparametric 85% Prediction Limit	29.7
Vanadium (V)	<5.04 - 152	96%	Mean + 2 SDs	120
Zinc (Zn)	<5.04 - 125*	87%	Mean + 2 SDs (Outlier Removed)	80.3
Cyanide (CN)	<0.963 - <1.81	0%	Detection Limit	DL
<i>Notes:</i>				
<i>DL - Detection Limit</i>				
<i>* - Outlier listed, however, removed for data interpretation</i>				
<i>SDs - Standard Deviations</i>				
<i>mg/Kg - milligrams per kilogram</i>				
<i>µg/Kg - micrograms per kilogram</i>				

Samples were typically collected in two-foot or four-foot intervals which sometimes resulted in samples selected across a lithologic contact. If this occurred, the lithologic unit for the sample would be classified by what the majority of the sample was composed of.

#### 4.4.1 Visual Indications of Tar-Like Material and Oil-Like Material

TLM and OLM were observed in soil borings (SB-11 and SB-39) advanced within Gas Holder No. 1 and soil borings (SB-12, SB-13 and SB-15) advanced within Gas Holder No. 2. The TLM and OLM were observed at the base of Gas Holder No. 1 at a depth of approximately 12.5 feet bgs and in Gas Holder No. 2 at a depth of approximately 41 feet bgs. In both gas holders, the TLM/OLM was a very high viscosity, black material and was observed in less than a one-inch layer or in tarry globules existing in less than a one-inch intervals.

#### 4.4.2 Volatile Organic Compounds

Upper background limits (UBLs) for VOCs in the soils are determined to be the detection limit. Figure 12 is a contour map of the horizontal extent of total detected benzene and total VOCs in soils. The horizontal extent of benzene in soil is defined to the north by soil samples from borings SB-03, SB-04, and SB-41. Benzene was detected in soil from boring SB-38 at a concentration of 0.062 mg/Kg. Based on the fact that benzene was not detected in soil samples collected from soil boring SB-21 (between the former MGP property and soil boring SB-38) the benzene concentration detected in SB-38 is most likely related to an off-property source. Soil borings SB-27 and SB-34 contain benzene concentrations in soil of 0.031 mg/Kg and 0.0057 mg/Kg, respectively. These borings are located up-gradient of the former MGP operations and these concentrations are most likely related to off-property sources. Benzene in soil is horizontally defined to the east by soil borings SB-02, SB-04, SB-22 and SB-26. To the west benzene in soil is horizontally defined by soil borings SB-16, SB-19, SB-20, and SB-28.

Total VOCs in soil are defined in all directions. To the north, the limits of VOCs in soil are defined by samples collected from soil borings SB-30, SB-31, and SB-38. The VOC concentrations detected in soil borings SB-34 and SB-38 consisted only of benzene and as described above, are likely related to off-property sources. To the east, the horizontal extent of total VOCs is defined by samples collected from soil borings SB-22, SB-23, SB-26, and SB-32. The only detected VOC in soil from SB-23 and SB-24 was carbon disulfide. This area is separated from the remaining VOC plume and is defined in all directions. The horizontal extent of VOCs is defined to the south by samples collected from soil borings SB-33 and SB-34 and to the west by samples collected from soil borings SB-29 and SB-36.

#### 4.4.3 Semivolatile Organic Compounds

The background limits for SVOCs are presented in Table 4.1 and on Figure 13. Figure 13 is a contour map of the horizontal extent of naphthalene detected in soils and total SVOC concentrations above background limits in soils. The horizontal limits of naphthalene in soil are defined in all directions. Three areas of naphthalene concentrations in soil are located at the Site and include an area northeast of the office and service shop, an area in the vicinity of Gas Holder No. 2, and an area along the southeastern property boundary. These are defined to the north by samples collected from soil borings SB-23, SB-31, and SB-41; to the east by samples from borings SB-32 and SB-43; to the south by samples from borings SB-26, SB-27, and SB-33; and to the west by samples from borings SB-19, SB-20, and SB-40.

The horizontal extent of total SVOCs in soil above UBLs is defined in all directions. The horizontal extent is defined to the north by samples from soil borings SB-23, SB-30, and SB-31. To the east the extent is defined by soil samples collected from borings SB-32 and SB-43. To the south, the horizontal limits of SVOCs above UBLs are defined by samples from soil borings SB-33/33B and SB-34 and to the west the extent is defined by samples collected from soil borings SB-21 and SB-36.

The soil sample initially collected from soil boring SB-33 at a depth of two to four feet bgs indicated a total SVOC concentration of 23.7 mg/Kg. A second sample was collected (SB-33B-2-4) from a boring adjacent to SB-33 and analyzed for SVOCs. The analytical results from this sample indicated a total SVOC concentration of 6.3 mg/Kg. Based on these results, the concentrations reported in the original sample collected from SB-33 are likely to have been a result of the presence of asphalt in the sample.

#### 4.4.4 Inorganics

Figure 14 is a map of the horizontal extent of barium and vanadium concentrations in soil above the UBLs. This map indicates that the horizontal extents of barium and vanadium are defined in all directions. The horizontal extent of barium in soil is defined to the north by samples from borings SB-04, SB-22, SB-30, and SB-38; to the east by SB-32 and SB-43 (background soil boring); to the south by SB-33 and SB-34; and to the west by SB-06, SB-19, and SB-20. The horizontal extent of vanadium in soil is defined to the north by samples from borings SB-30 and SB-38; to the east by SB-02, SB-04, and SB-22; to the south by SB-27; and to the west by SB-06, SB-28, and SB-39.

Figure 15 illustrates the horizontal delineation of lead and mercury concentrations above UBLs in soils. The horizontal extents of lead and mercury in soil above the UBL are defined in all directions. The horizontal extent of lead in soil is defined to the north by samples from borings SB-21, SB-30, and SB-31; to the east by SB-43 (background soil boring); to the south by SB-33 and SB-34; and to the west by SB-06, SB-19, SB-20, SB-29 and SB-44. The highest concentration of lead detected in soils is from a sample (SB-45-15-17; 1,070 mg/Kg) collected from fill material on a property that is located up-/cross-gradient and to the south of the former MGP operations. Lead associated with this sample is highly unlikely to be related to the former MGP operations, and is more likely related to fill material. Lead at this location is delineated to the UBLs in all directions. The sample collected from SB-32 (located east of the former MGP facility along the Ocmulgee River) at two to four feet bgs contained a lead concentration of 43 mg/Kg in natural soils. This result is likely related to river deposition since no direct route of migration exists between SB-32 and the former MGP property. Also, concentrations of lead above the UBL from soil borings (SB-23 and SB-24) located on the MGP property occurred in the fill material and not in natural soils. No other COI was detected above a UBL in SB-32. Mercury concentrations in soil above the UBL are horizontally defined in all directions at the Site. The horizontal extent of mercury in soils is defined to the north by samples collected from soil borings SB-31 and SB-38; to the east by samples from borings SB-32 and SB-43; to the south by samples from borings SB-33 and SB-34; and to the west by samples from boring SB-36. Mercury was detected in soil boring SB-30 (located to the north of the former MGP facility, in the direction of the Ocmulgee River) at a depth of 8 to 12 feet bgs, at a concentration of 0.154 mg/Kg. The mercury UBL concentration for natural soils is the detection limit which is 0.129 mg/Kg. As with the lead UBL exceedance in

soil boring SB-32, the mercury exceedance in SB-30 is in natural soils and is likely related to river depositions. Other than beryllium, mercury was the only COI exceeding background in SB-30 and beryllium was not detected above the UBL anywhere else on the Site.

Figure 16 is a contour map of sample locations with arsenic, copper and zinc concentrations in soil above the UBLs. The horizontal extents of arsenic, copper and zinc in soil exceeding the UBL are defined in all directions. The horizontal extent of arsenic in soil is defined to the north by samples from boring SB-14; to the east by SB-25; to the south by SB-34; and to the west by SB-39. The horizontal extent of copper in soil is defined to the north by samples from borings SB-02; SB-03, SB-06, SB-07, SB-23, SB-25, and SB-26; to the east by SB-32 and SB-43 (background soil boring); to the south by SB-33 and SB-34; and to the west by SB-36 (background soil boring) and SB-38. The horizontal extent of zinc in soil is defined to the north by samples from borings SB-15 and SB-22; to the east by SB-32 and SB-43 (background soil boring); to the south by SB-33; and to the west by SB-19 and SB-20.

Figure 17 illustrates the horizontal delineations of chromium and cyanide concentrations above the UBLs. The horizontal extents of chromium and cyanide concentrations exceeding the UBL are defined in all directions. Chromium was present in two areas of the Site. The horizontal extent of chromium in soil in the first area is defined to the north by samples from borings SB-38B; to the east by SB-41; and to the south by SB-29. The second area is defined by SB-04 to the north; SB-22 to the east; SB-02 to the south; and SB-15 and SB-40 to the west. The horizontal extent of cyanide in soil is defined to the north by samples from borings SB-21, SB-31, and SB-41; to the east by SB-22 and SB-25; to the south by SB-33 and SB-34; and to the west by SB-29 and SB-36 (background soil boring).

Cadmium and nickel were not detected above their respective UBLs in any samples collected during the SI and CSI.

#### **4.5 VERTICAL EXTENT OF CONSTITUENTS OF INTEREST IN SOILS**

The vertical extent of COI in soils exceeding the UBL is defined at the Site by one of three methods, including:

- The deepest samples in a given soil boring are below the UBL (e.g., in SB-27 the soil sample collected from 8 to 12 feet bgs had a lead concentration of 634 mg/Kg but the sample collected from 20 to 21 feet bgs had a lead concentration of 6.35 mg/Kg);
- A sample collected at a deeper depth from a near by boring exhibited concentrations below the UBL (e.g., samples collected from SB-04 at 21.5 to 23.5 feet bgs had SVOC concentrations above the UBL but samples collected during the installation of MW-6 at a depth of 34 to 39 feet bgs were below detection limits for all analyzed SVOCs); and
- The deepest sample in the boring is immediately above competent rock (e.g., the sample collected from SB-38 at a depth of 34 to 38 feet bgs had a benzene concentration of 0.062 mg/Kg and auger refusal was encountered at 38 feet bgs).

**SECTION 5**  
**GROUNDWATER INVESTIGATION**

# SECTION 5

## GROUNDWATER INVESTIGATION

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### 5.1 GENERAL APPROACH AND RATIONALE

Groundwater at the Site was evaluated by the use of seven permanent monitoring wells (four installed during the SI and three installed during the CSI). All seven monitoring wells (MW-01 through MW-07) were constructed as Type II (single-cased) monitoring wells. The objectives of the study were to define the horizontal and vertical extents of dissolved COI related to the former MGP operations, to collect data in regard to aquifer characterization, and to obtain data concerning natural attenuation parameters. The locations of the sampling points were determined by the presence of existing monitoring wells, historical information, and information gathered during the CSI. Each of the monitoring wells was designated by MW-#. After completion of the field work, surveys were conducted of sampling points by a surveyor certified by the State of Georgia (Donaldson, Garrett, & Associates, Inc.). Williams performed the survey of MW-07. The surveys referenced the previous Site survey conducted during the SI.

### 5.2 SITE HYDROGEOLOGY

#### 5.2.1 General

The most recent water level measurements were collected at each of the monitoring wells (MW-01 through MW-07) on August 20, 2003 between 7:15 a.m. to 9:00 a.m., utilizing an electronic water level indicator. Depth to water in each well was measured from the northern side on the top of each casing. Elevations of top of casings and ground elevations for each monitoring well are listed on Figure 3. Depth to top of groundwater measured in the monitoring wells ranged from 7.32 feet to 22.75 feet below top of casing on August 20, 2003 (excludes MW-06 as this is a deep monitoring well). Table 5.1 summarizes the historical depths to water and elevations for the monitoring wells.

#### 5.2.2 Hydrogeologic Characteristics

##### 5.2.2.1 Hydraulic Conductivity

Hydraulic conductivity was estimated through slug tests conducted in monitoring wells during the SI and the CSI. LAW performed slug tests in 1992, during the SI, in monitoring wells MW-01, MW-02, MW-03, and MW-04. Slug tests were performed during the CSI on April 12 and 13, 2001, in monitoring wells MW-01 through MW-06 (data collected from MW-03 were not usable).

The following methods were utilized during slug tests performed during the CSI. Slug-in tests were performed by lowering a weighted, five-foot long PVC pipe into the water column in each of the tested wells to cause an instantaneous water level change in the well. Slug-out tests were performed by withdrawing the PVC slug and recording head changes versus time. The changes in head with respect to time were recorded with a pressure transducer and data logger. The data from all of the slug tests were analyzed using the Bouwer and Rice (1976) analytical method for estimating

hydraulic conductivity of unconfined aquifers or leaky confined aquifers. The computer program AQTESOLV (Geraghty and Miller, 1991) was used to calculate the hydraulic conductivity and prepare graphs of the data.

**TABLE 5.1  
WATER LEVEL DEPTHS AND ELEVATIONS**

Well ID #	Date Gauged	Top of Casing Elevation*	Depth to Groundwater	Water Table Elevation*
MW-01	March 11, 1992	325.84	7.85	317.99
	March 12, 2001		10.42	315.42
	March 29, 2001		9.50	316.34
	August 20, 2003		7.32	318.52
MW-02	March 11, 1992	317.87	20.14	297.73
	March 12, 2001		20.61	297.26
	March 29, 2001		19.99	297.88
	August 20, 2003		18.23	299.64
MW-03	March 11, 1992	317.09	23.47	293.62
	March 12, 2001		22.36	294.73
	March 29, 2001		23.22	293.87
	August 20, 2003		22.00	295.09
MW-04	March 11, 1992	318.42	24.77	293.65
	March 12, 2001		25.40	293.02
	March 29, 2001		25.61	292.81
	August 20, 2003		22.75	295.67
MW-05	March 11, 1992	316.62	NA	NA
	March 12, 2001		NA	NA
	March 29, 2001		22.32	294.30
	August 20, 2003		19.17	297.45
MW-06	March 11, 1992	318.41	NA	NA
	March 12, 2001		NA	NA
	March 29, 2001		32.31	286.10
	August 20, 2003		35.28	283.13
MW-07	March 11, 1992	318.07	NA	NA
	March 12, 2001		NA	NA
	March 29, 2001		NA	NA
	August 20, 2003		18.95	299.12

\*in feet above mean sea level (MSL)  
NA – Not Available (well not constructed)

The average hydraulic conductivity for wells (MW-02, MW-04, and MW-05) screened in the fill material was determined to be 1.73 E-02 feet per minute (ft/min). The average hydraulic conductivity for the well screened in the saprolite (MW-01) and the well screened in the alluvium (MW-06) was determined to be 3.77 E-04 ft/min and 3.60 E-04 ft/min, respectively. Table 5.2 summarizes the results of slug tests performed both during the SI and the CSI and indicates the depth each well was screened. Appendix I includes the time and head data, input parameters, and graphs from the slug tests performed during the CSI.

**TABLE 5.2  
SUMMARY OF HYDRAULIC CONDUCTIVITY DATA**

Well ID	Test Date	Well Depth (ft. BTOC)	Water Level (ft. BTOC)	Screened Interval (ft. BTOC)	Test Type	Hydraulic Conductivity (ft/min)
<b>Saprolite</b>						
LAW DATA (from SI)						
MW-01	03/13/92	18	8.9	8-18	Slug-out	4.8 E-05
WILLIAMS DATA (from CSI)						
MW-01	04/13/01	18	9.15	8-18	Slug-out	7.05 E-04
AVERAGE (Law and Williams Data)						3.77 E-04
<b>Fill</b>						
LAW DATA (from SI)						
MW-02	03/12/92	28	19.96	18-28	Slug-out	1.1 E-03
MW-04	03/12/92	33	24.78	23-33	Slug-out	2.1 E-02
WILLIAMS DATA (from CSI)						
MW-02	04/13/01	28	19.83	18-28	Slug-out	1.61 E-03
MW-04	04/13/01	33	24.30	23-33	Slug-out	5.89 E-02
MW-05	06/07/01	30	21.81	15-30	Slug-out	3.79 E-03
AVERAGE (Law and Williams Data)						1.73 E-02
<b>Alluvium</b>						
MW-06	06/07/01	50	33.69	40-50	Slug-in Slug-out	3.95 E-04 3.24 E-04
AVERAGE						3.60 E-04
BTOC – below top of casing.						
ft. – feet.						
ft/min – feet per minute.						

**5.2.2.2 Physical Soil Testing**

Physical soil testing was performed during the SI on one soil sample collected from the boring associated with the installation of monitoring well MW-02. The sample was analyzed for total porosity, water content, dry density, hydraulic conductivity, total organic carbon, and organic content. Four soil samples were collected during the CSI from the boring associated with the installation of monitoring well MW-05 to determine grain size distribution, specific gravity, permeability, porosity, and percent moisture for the soils encountered across the area.

The samples collected during the CSI were analyzed by Southern Company Central Laboratory. Laboratory results for the physical soil tests from both the SI and CSI are shown in Tables 5.3, 5.4, and 5.5. Laboratory reports for samples collected during the CSI are included as Appendix J.

**TABLE 5.3  
SUMMARY OF PHYSICAL SOIL TESTS  
CONDUCTED DURING THE SI**

Sample ID	Water Content (%)	Porosity (%)	Vertical Permeability cm/sec	TOC (mg/Kg)	Organic Content (%)	Dry Unit Weight (pcf)
ASB-02 (24-26)*	22.4	36.3	1.9 E-06	3,400	1.4	105.4
cm/sec – centimeters per second						
mg/Kg – milligrams per kilogram						
PCF – Pounds per cubic foot						
TOC – Total organic carbon						
* approximate depth						

**TABLE 5.4  
GRAIN SIZE DISTRIBUTION**

Sample ID	% Gravel	% Sand	% Silt/Clay
<b>Fill</b>			
ST-1-4-6.5	6.4	57.5	36.1
ST-1-12-14.5	1.9	60.3	37.8
ST-1-20-22.5	0.3	58.3	41.4
ST-1-28-30.5	1.2	64.1	34.7

**TABLE 5.5  
SUMMARY OF PHYSICAL SOIL TESTS  
CONDUCTED DURING THE CSI**

Sample ID	Water Content (%)	Porosity (%)	Vertical Permeability (cm/sec)	Specific Gravity	Wet Unit Weight (PCF)	Dry Unit Weight (pcf)
ST-1-4-6.5	17.7	37.4	4.9 E-05	2.64	121.3	103.1
ST-1-12-14.5	17.1	38.1	2.3 E-05	2.65	119.8	102.3
ST-1-20-22.5	17.3	33.5	8.6 E-07	2.65	129.1	110.1
ST-1-28-30.5	21.0	35.4	5.2 E-05	2.65	129.3	106.9

*cm/sec – centimeters per second  
PCF – Pounds per cubic foot*

### 5.2.3 Groundwater Flow

Figure 18 is a map showing the configuration of the top of the water table on August 20, 2003. Depth to top of groundwater ranged from 7.32 feet below top of casing (MW-01) to 22.75 feet below top of casing (MW-04). Due to the proximity of MW-06 to MW-04, and the difference in water table elevations between these two wells, MW-06 was not used in determining groundwater flow direction or gradient in the upper water bearing zone. However, the relationship of these two wells provides data to determine the general vertical flow characteristics at the Site. The higher groundwater elevation measured in MW-04 (295.67), which is screened across the water table (295.38 to 285.38), versus the potentiometric head measured in MW-06 (283.13), which is screened below the water table (278.76 to 268.76), indicates a downward flow regime. The horizontal flow pattern for groundwater in the soils under the former MGP facility is generally to the east at an average gradient of 0.086 ft/ft (Figure 18).

The groundwater flow velocity or seepage velocity (V) can be determined using the horizontal hydraulic conductivity, hydraulic gradient, and effective porosity. Site values for horizontal hydraulic conductivity and hydraulic gradient were determined from the data collected during the SI and CSI. Effective porosity can be estimated from published literature based on the presence of fine sand/clayey sand. The groundwater flow velocity was calculated separately for groundwater within the saprolite (from monitoring well MW-01), fill material (from monitoring wells MW-02, MW-04, MW-05, and MW-07) and alluvium (from monitoring well MW-06).

The groundwater flow velocity is calculated from the equation:

$$V = k \cdot \frac{i}{n_e}$$

Where:

- $k$  = hydraulic conductivity = 3.7 E-04 ft/min. for saprolite, 1.73 E-02 ft/min. for fill material, and 3.60 E-04 ft/min for alluvium (average from slug tests);
- $i$  = hydraulic gradient = 0.086 (from Figure 18); and
- $n_e$  = effective porosity = 0.20 for saprolite and fill material (silt), and 0.33 for alluvium (fine sand); from Groundwater Hydrology and Hydraulics, D. B. McWhorter and D. K. Sunada, 1977).

Using the assumptions listed above, the average groundwater flow velocity at the Site is approximately 0.23 ft/day or 84 ft/year for groundwater flow in the saprolite, 10.7 ft/day or 3,900 ft/year for groundwater flow within the fill material, and 0.14 ft/day or 200 ft/year for groundwater flow within the alluvium. However, due to adsorption and degradation, the COI are expected to migrate at a slower rate.

### 5.3 GROUNDWATER MONITORING WELL INSTALLATION AND RATIONALE

Descriptions of the installation and rationale of monitoring wells MW-01 through MW-04 can be found in the SI Report by LAW.

Monitoring wells MW-05, MW-06, and MW-07 were installed during the CSI. Monitoring wells MW-05 and MW-07 were installed to define the horizontal extent of COI related to the former MGP operations in groundwater. Monitoring well MW-06 was installed adjacent to MW-04 and approximately 16 feet deeper to insure vertical delineation of COI related to the former MGP operations in groundwater.

Soil borings for the Type II monitoring wells installed during the CSI were advanced with 6.25-inch outside-diameter (OD) HSAs. The soil borings for monitoring wells MW-05 and MW-07 were advanced to 30 feet bgs and 32.5 feet bgs, respectively. Monitoring wells MW-05 and MW-07 were constructed with 15 feet of two-inch diameter, 0.010-inch slotted schedule 40 PVC screen and 15 feet of two-inch diameter schedule 40 PVC riser. Following installation of the well screen and riser, a sand pack was placed in the annulus from the total depth to a point approximately two feet above the top of the screen. Approximately two feet of bentonite were placed in the annulus above the sand pack to effect a seal. Grout was placed in the annulus from the top of the seal to ground level.

Monitoring well MW-06 was constructed with 10 feet of pre-packed well screen and 40 feet of PVC riser. The pre-packed screen consisted of 10-feet of an inner two-inch diameter, 0.010-inch slot, schedule 40 PVC screen and an outer 3.5-inch diameter, 0.010-inch slot schedule 40 PVC screen. The annular space between the screens was filled with sand pack material prior to installation. Following installation of the well screen and riser, a sand pack was placed in the annulus between the borehole and well construction material from the total depth to a point approximately two feet above the top of the screen. Approximately two feet of bentonite were placed in the annulus above the sand pack to effect a seal. Grout was placed in the annulus from the top of the seal to ground level. Each well was finished at the surface with a flush-mounted metal well guard.

More detailed information concerning well construction for all of the monitoring wells at the Site are summarized on Table 5.6. Monitoring well construction diagrams are included in Appendix K.

Each of the new and existing monitoring wells was developed, or redeveloped, respectively, by pumping with a submersible pump until the water was relatively free of suspended solids. The water removed from the wells was pumped into a waste water tank or drums located at the Site.

**TABLE 5.6  
SUMMARY OF MONITORING WELL CONSTRUCTION INFORMATION**

Well ID #	Ground Surface Elevation *	Top of Casing Elevation*	SCREENED INTERVALS	
			Elevation (MSL)	Feet bgs
MW-01	326.45	325.84	314.95-304.95	11.5-21.5
MW-02	318.34	317.87	300.84-290.34	18-28
MW-03	317.55	317.09	297.05-287.05	20.5-30.5
MW-04	318.88	318.42	295.38-285.38	23.5-33.5
MW-05	316.99	316.62	301.99-286.99	15-30
MW-06	318.76	318.41	278.76-268.76	40-50
MW-07	318.33	318.07	300.83-285.83	17.5-32.5

\* - feet above mean sea level (MSL)

#### 5.4 SAMPLING AND ANALYSIS

Two rounds of groundwater sampling were performed as part of the CSI. The first sampling event occurred during March 2001 and the second event occurred during August 2003. Groundwater analytical data were obtained through groundwater samples collected from the monitoring wells. The groundwater samples were analyzed by Analytical Environmental Services, Inc. (AES) for the COI. Groundwater samples collected for natural attenuation parameters during the March 2001 sampling event were analyzed by Microseeps in Pittsburgh, Pennsylvania. Appendix C-2 contains summary tables of the analytical reports. Attachment A of this CSR contain copies of analytical data collected during the CSI.

##### 5.4.1 Sampling Methods

Depths to groundwater were measured in the monitoring wells using a water level indicator. Depths to water, well diameter and well depths from the monitoring wells were used to calculate well volumes. Purging was accomplished using a peristaltic pump and dedicated polyethylene tubing. A minimum of three well volumes of water was removed from each well during purging. Temperature, pH, specific conductivity, dissolved oxygen, turbidity, and oxidation/reduction potential were measured during purging. The wells were purged until these field parameters had equilibrated and turbidity was less than 5 NTUs. Measurements were recorded on water quality sampling forms found in Appendix L. Groundwater samples collected during the March 2001 sampling event for VOCs and SVOCs were collected immediately following purging. Samples for analyses of inorganic COI were collected within 24 hours of purge completion using quiescent sampling techniques. For the August 2003 sampling event, samples were collected

immediately following purging with the exception of the sample from MW-01 which was allowed to recharge overnight after the well went dry. Purge water was collected and transported to the waste water tank or drums.

Groundwater samples were also collected during the March 2001 sampling event from each monitoring well for natural attenuation parameters which included ammonia as nitrogen, ferrous iron, nitrate, sulfate, sulfide, iron, manganese, dissolved manganese, carbon dioxide, methane, nitrogen, and oxygen. Natural attenuation parameters in groundwater were analyzed to determine the applicability of biodegradation of COI in groundwater for the purposes of remediation if necessary.

#### **5.4.2 Sample Handling and Preservation Techniques**

Groundwater samples collected for COI related to former MGP operations from the monitoring wells were analyzed for VOCs, SVOCs, metals, and cyanide. The samples were collected in the following order: 1) VOCs; 2) SVOCs; and 3) inorganic compounds. The samples were placed in the appropriate containers with the appropriate preservatives prescribed by the Work Plan. The samples were designated by the well number and identified by attaching sample labels with the required information completed. The sample containers were sealed in plastic bags, placed in a trash bag and sealed in a cooler with plastic bubble wrap and ice. Chain-of-custody forms were completed for each SDG and shipped with the samples. Each shipment of samples was assigned a SDG number. Equipment rinse blanks and field duplicate samples were included in the SDGs and were analyzed for the COI. Trip blanks and field blanks were included in the SDGs and analyzed for VOCs only.

Groundwater samples collected for natural attenuation parameters were placed in appropriate containers with the appropriate preservative as prescribed by the Work Plan. The sample containers were sealed in plastic bags, placed in a trash bag and sealed in a cooler with plastic bubble wrap and ice. Chain-of-custody documentation accompanied each shipment. All samples sent for natural attenuation parameters were shipped overnight via Federal Express.

#### **5.4.3 Decontamination Procedures**

Decontamination procedures were followed according to the Work Plan. All reusable down-hole equipment, consisting of the water level indicator, pressure transducer, and tape measure was decontaminated prior to entering the well. Decontamination was performed by washing the equipment in a solution of tap water and Liquinox, and rinsing with deionized water, isopropanol and organic-free water. Throughout the sampling and decontamination procedures, new disposable gloves were worn when equipment was handled.

#### **5.4.4 Laboratory Methods**

Groundwater samples for COI analyses were shipped to AES, via Federal Express Priority Overnight. Samples were analyzed for VOCs and methyl-tert-butyl-ether (MTBE; only during the March 2001 sampling event) according to SW-846 Method 8260, SVOCs according to SW-846 Method 8270A, and inorganic constituents using SW-846 Method 6010 except for mercury and total cyanide which were analyzed using SW-846 Method 7471 and SW-846 Method 9010, respectively. The CRQLs were based on the laboratory's self-determined PQL.

Groundwater samples collected for natural attenuation parameters were shipped to Microseeps, via Federal Express Priority Overnight. Table 5.7 lists the methods numbers for each parameter analyzed.

**TABLE 5.7  
ANALYTICAL METHODS FOR NATURAL ATTENUATION PARAMETERS**

Parameter	Method
Ammonia as Nitrogen	EPA Method 350.2
Ferrous Iron	Modified SW-846 Method 7199
Nitrate, Nitrite, Sulfate	SW-846 Method 9056
Sulfide	EPA Method 376.1
Iron, Manganese, Dissolved Manganese	SW-846 Method 6010
Carbon Dioxide, Nitrogen, Oxygen	AM 15*
Methane	AM 18*

\* Microseeps Method

A complete CLP-like data package was prepared by AES for one water SDG. The data package was submitted to Southern Company Chemical Services for data validation using USEPA SMO Data Validation Functional Guidelines. All laboratory data were considered by Southern Company Chemical Services to be acceptable. Southern Company Chemical Services also reviewed the laboratory data for PARCC parameters. Southern Company Chemical Services found the PARCC parameters acceptable (Appendix G-1). The laboratory packages for the remaining SDGs were reviewed and qualified by Williams for quality assurance/quality control measurements and results are included in Appendix G-2.

## 5.5 BACKGROUND CONCENTRATIONS

Background concentrations of the COI for groundwater were determined from the groundwater samples collected from monitoring well MW-01 for inorganic compounds. This well is located up-gradient from any known MGP source area (Figure 18). Table 5.8 lists the background concentrations for the inorganic COI in groundwater. The UBLs for VOCs and SVOCs were assumed to be the detection limit.

**TABLE 5.8  
CALCULATED BACKGROUND  
CONCENTRATIONS**

GROUNDWATER	
INORGANICS	
ANALYTE	UPPER BACKGROUND LIMIT (mg/L)
Arsenic (As)	Detection Limit
Barium (Ba)	Detection Limit
Beryllium (Be)	Detection Limit
Cadmium (Cd)	Detection Limit
Chromium (Cr)	Detection Limit
Copper (Cu)	Detection Limit
Lead (Pb)	Detection Limit
Mercury (Hg)	Detection Limit
Nickel (Ni)	Detection Limit
Zinc (Zn)	0.029
Cyanide (CN)	Detection Limit

## **5.6 HORIZONTAL AND VERTICAL EXTENT OF CONSTITUENTS OF INTEREST IN GROUNDWATER**

Analytical results of the COI for all groundwater samples collected during the CSI are summarized in Appendix C-2. Cross-sections A-A' through C-C' (Figures 7 through 9) show the horizontal and vertical extent of the COI in groundwater samples collected during the CSI sampling event. An isoconcentration map (Figure 19) was also prepared for various COI detected in the groundwater from monitoring wells sampled during the August 2003 CSI field sampling event. In addition to the previously listed COI, MTBE analyses were conducted on collected groundwater samples during the March 2001 for the purpose of fingerprinting possible impacts and determining potential off-property sources.

### **5.6.1 Horizontal Extent of Volatile Organic Compounds in Groundwater**

Groundwater samples collected during the August 2003 sampling event did not contain any detectable concentrations of VOCs. The groundwater sample collected from monitoring well MW-01 (up-gradient of the former MGP facility) during the March 2001 sampling event contained benzene at a concentration of 9.1 µg/L (duplicate sample Dup031201A collected from MW-01 did not contain a detectable concentration of benzene). This was the only groundwater sample collected during the CSI that contained benzene and MW-01 is located immediately down-gradient of a known off-Site UST related release and cross-gradient of another off-Site UST release (these plumes are presented on Figure 19). Therefore, the benzene concentration detected in MW-01 during the March 2001 sampling event is not related to the former MGP facility.

MTBE was detected in groundwater samples collected from MW-02 and MW-04 at 8.5 µg/L and 18 µg/L, respectively during the March 2001 sampling event. As MTBE is a synthetic compound developed in the 1970's, and MGP operations ceased in the early 1900's, it can be assumed that the concentrations of MTBE in groundwater at the Site are representative of off-site sources (likely related to the up-gradient USTs).

### **5.6.2 Horizontal Extent of Semivolatile Organic Compounds in Groundwater**

Detectable SVOC concentrations were reported in only two groundwater samples collected during the August 2003 CSI sampling event (MW-02 and MW-05; Figure 19). Analytical results indicated the presence of acenaphthene at concentrations of 12 µg/L and 14 µg/L slightly above the detection limit of 10 µg/L in MW-02 and MW-05, respectively. No other SVOCs were detected in groundwater samples collected during the August 2003 sampling event.

### **5.6.3 Horizontal Extent of Inorganics in Groundwater**

The horizontal extents of inorganic constituents detected in groundwater above the background limits are defined at the Site (Figure 19). Concentrations of all inorganic COI, with the exception of barium and cyanide, were below the laboratory detection limit in the groundwater samples collected during the August 2003 sampling event. Barium was detected in monitoring wells MW-02 through MW-07. The background monitoring well (MW-01) did not contain detectable levels of barium. When evaluated independently, the chemical data suggests that there has been a barium release to groundwater that is not defined. However, when the data is evaluated in combination with geologic units and background soil chemical analysis, the data suggests the barium present in the groundwater at the Site is related to

alluvial soils and fill material. This is based on the fact that the background well (MW-01) is the only well that is screened within the saprolite and the remaining wells are screened within fill material and/or alluvium. Specifically, MW-03, MW-05, and MW-07 are screened completely in the fill material, MW-02 and MW-06 are screened completely in the alluvium, and MW-04 is screened across the fill material and alluvium contact. An evaluation of barium in soil from the background soil borings shows that barium is not present above the detection limit in the saprolite background soil samples, however, barium is present in the fill material and alluvium background soil samples at concentrations ranging from 11.1 mg/kg to 126 mg/kg and 30.1 mg/kg to 338 mg/kg, respectively. Additionally, barium is not present in soils at the locations of former MGP operations at concentrations exceeding the soil background concentrations, demonstrating that a release of barium has not occurred at the MGP facility. Therefore, the barium present in the groundwater is directly related to the barium present in the fill material and alluvium, and not the former MGP operations. Cyanide was detected in monitoring well MW-02 at a concentration of 0.048 mg/L (Figure 19) and is defined in all directions by MW-01, MW-04, MW-05, and MW-07 (MW-07 is a new well that was installed to define the cyanide present in MW-02).

#### **5.6.4 Natural Attenuation Parameters**

Groundwater samples were collected from all monitoring wells (MW-01 through MW-06) during the March 2001 sampling event and analyzed for natural attenuation parameters. Based on analytical results of COI in groundwater, further study of the results from the natural attenuation parameter analysis is not warranted at this time.

**SECTION 6**  
**INVESTIGATION OF NONAQUEOUS PHASE**  
**LIQUIDS**

## **SECTION 6**

# **INVESTIGATION OF NONAQUEOUS PHASE LIQUIDS**

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### **6.1 GENERAL OBSERVATIONS**

Non-aqueous phase liquids (NAPL) were not identified at the Site during the CSI. Williams advanced borings in the vicinity of former structures where NAPL could potentially be encountered in the subsurface.

### **6.2 SOIL BORINGS**

During the CSI, borings were advanced in areas where structures appear to have been located according to the Sanborn maps. A minimal amount of TLM and/or OLM was observed in two borings (SB-11 and SB-39) installed within Gas Holder No. 1 and three borings (SB-12, SB-13, and SB-15) installed within Gas Holder No. 2. In SB-11 and SB-39, the TLM and/or OLM were observed at the base of the gas holder at a depth of approximately 12.5 feet bgs in less than one-inch lens. The TLM and/or OLM were observed at the base of Gas Holder No. 2 at a depth of approximately 41 feet bgs in a less than one-inch layer.

### **6.3 MONITORING WELLS**

No measurable thickness of light non-aqueous phase liquid (LNAPL) or dense non-aqueous phase liquid (DNAPL) was observed during the CSI in any of the monitoring wells.

**SECTION 7**  
**SEDIMENTS INVESTIGATION**

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## SECTION 7

# SEDIMENTS INVESTIGATION

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The CSI assessed the potential impact of the COI on sediments in the Ocmulgee River. The river is located approximately 200 feet northeast of the former MGP facility.

Williams performed an investigation of the sediments of the Ocmulgee River on April 11, 2001. Sediment samples were collected using hand DPT for visual observation only to determine if sediments had been impacted by former MGP operations. Sediment samples were collected at approximately 100 foot intervals along the western bank of the river beginning at the Spring Street bridge and extending approximately 700 feet south of the bridge. At each interval, samples were collected from 0-2 feet and 2-4 feet below the top of the sediment at approximately three feet and 13 feet from the edge of the river bank. Depth to the top of the sediment from the water level was measured for each location and is recorded on boring logs included in Appendix D-3. The boring logs also include a lithologic description and any observation of visible staining, if present. Additional sediment samples were collected for visual observation at the culvert located on the south side of the bridge (Figure 3).

A hydrocarbon-like staining and odor (possibly diesel fuel in nature) were noted in four sediment samples (SD-D-30, SD-D-40, SD-E-3, and SD-E-8) collected in the vicinity of the culvert. Due to the large drainage basin that includes several other potential sources (several UST facilities, manufacturing facilities, commercial area and roadways) associated with this culvert, the lack of a direct hydraulic connection with the former MGP facility and the fact that the hydrocarbon-like odor resembled that of diesel fuel, it does not appear likely this is associated with the former MGP operations (see Figure 5). Minor amounts of coal-like material were observed in the sediment sample (SD-D-20) collected approximately 20 feet outward from the culvert and one piece of slag-like material was observed in the sample collected approximately 20 feet downstream and approximately three feet from the edge of the bank (SD-E-3). None of the sediment samples collected indicated the presence of TLM or OLM semi-volatile organic compounds.

**SECTION 8**  
**PROPERTIES POTENTIALLY AFFECTED BY A**  
**RELEASE AND OTHER POTENTIALLY**  
**RESPONSIBLE PARTIES**

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# SECTION 8

## PROPERTIES POTENTIALLY AFFECTED BY A RELEASE AND OTHER POTENTIALLY RESPONSIBLE PARTIES

### 8.1 PROPERTIES POTENTIALLY AFFECTED BY A RELEASE

As defined by the CSI, the properties potentially affected by a release from the former MPG facility are shown on Figure 2 and include the following owners and/or occupants listed in Table 8.1.

**TABLE 8.1**  
**OWNERS OF POTENTIALLY AFFECTED PROPERTIES**

Affected Parcel	Parcel Address	Parcel Owner	Address and Telephone Number
OC-98-5I	32 Spring Street Macon, Georgia	Eagle West, LLC	Outdoor West 8976 N. Expressway Griffin, GA 30223 Phone: 770-227-2060
OC-98-5C OC-98-5D OC-98-5G OC-98-5H	40 Spring Street 40 Spring Street 40 Spring Street 36 Spring Street	Kayo Oil Company	Kayo Oil Company c/o Conoco P.O. Box 1039 Wilmington, GE 19899 Phone: 770-425-2507
OC-98-5A	44 Spring Street	Pizza Hut of America, Inc.	66 Frank Street Macon, GA 31201 Phone: 912-741-2525
OC-98-4F	66 Spring Street	Travis R. Crouch, Jr. et Al.	Jeanette C. Miller P.O. Box 35370 Louisville, KY 40232 Phone: Not Available
OC-98-3A OC-98-3B OC-98-3D OC-98-4H	855 Riverside Drive 855 Riverside Drive 855 Riverside Drive 886 Willow Street	Schuster Enterprises, Inc.	Schuster Enterprises, Inc. P.O. Box 12029 Columbus, GA 31917 Phone: 706-563-3066
OC-99-4AB	815 Riverside Drive Macon, Georgia	City of Macon, Transit Authority	City Hall 700 Poplar Street Macon, GA 31201 Phone: 478-751-7110
OC-98-2A OC-98-2B	847 Riverside Drive 839 Riverside Drive	Roscoe Douglas, Jr.	P.O. Box 2823 Macon, GA 31203 Phone: 478-475-9555
OC-98-5J	801 Riverside Drive	City of Macon Central Services	801 Riverside Drive Macon, GA 31201 478-751-9147
OC-99-4A	725 Riverside Drive	Macon-Bibb County Urban Development Authority	305 Coliseum Drive Macon, GA 31201 Phone: 478-741-8000
R-O-W Norfolk Southern	NA	Norfolk Southern Corporation	Three Commercial Place Norfolk, VA 23510-9227 757-629-2600

## 8.2 OTHER POTENTIALLY RESPONSIBLE PARTIES

HSRA regulations, by which this report is being prepared, require the name, address, and telephone number of any other person who may be a responsible party for the Site and a description of the type and amount of regulated substances such party may have contributed to a release.

The following potentially responsible parties have been identified at this time:

The City of Macon  
700 Poplar street  
Macon, Georgia

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

Atlanta Gas Light Company  
10 Peachtree Place  
Atlanta, GA 30309

**SECTION 9**  
**POTENTIAL RECEPTOR STUDY AND RISK**  
**REDUCTION STANDARDS**

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# SECTION 9

## POTENTIAL RECEPTOR STUDY AND RISK REDUCTION STANDARDS

This section evaluates the potential for exposure of human populations to COI detected in soil and groundwater at the Site. For exposure to occur a contaminant has to reach a receptor. Movement of a substance through the environment from a source, to a point of contact with an individual is defined as exposure pathway. A complete exposure pathway consists of four elements: 1) chemical source and release mechanisms, 2) environmental transport media, 3) a receptor at the exposure point, and 4) an exposure route at the exposure point. Without all four elements, an exposure pathway is incomplete, and consequently, no exposure could occur. Each of the elements as they exists at the Site are described below.

### 9.1 CHEMICAL SOURCE AND RELEASE MECHANISMS

At the Macon 2 former MGP facility, MGP constituents appear to have potentially been released from more than one source involved in the manufacture or storage of gas or its by-products. Section 2.5 lists known and potential sources of the COI and a general description of each identified potential source. The actual mechanism for release of COI from each source is not known; however, releases likely occurred due to spillage or leakage during the gas manufacturing process or leakage during storage of MGP by-products.

### 9.2 ENVIRONMENTAL TRANSPORT MEDIA

#### 9.2.1 Persistence of Constituents of Interest

The primary MGP constituents detected in soil and groundwater at the Site are PAHs, VOCs, metals, and cyanide. The physical and chemical characteristics of these compounds vary widely which causes differences in the behavior of movement of each compound in the environment. Table 9.1 lists physical and chemical characteristics for select COI found at the Site that determine their fate and transport in environmental media.

TABLE 9.1  
PHYSICAL AND CHEMICAL CHARACTERISTICS OF SELECT CONSTITUENTS OF INTEREST

Constituent of Interest	Water Solubility (ppm)	Vapor Pressure (torr)	Henry's Law Constant	Koc Water/Carbon (ml/g)
Benzene	1.8E+03	9.5E+01	5.6E-03	5.51E+01
Benzo(a)pyrene	1.63E-03	5.5E-09	1.1E-06	7.91E+05
Naphthalene	3.1E+01	8.5E-02	4.8E-04	1.76E+03
Pyrene	1.4E-00	4.6E-06	1.1E-05	6.56E+04
Lead	—	0.00E+0	—	—

Source: Superfund Chemical Data Matrix, EPA, 1996

Those chemicals with higher water solubility values, such as benzene, are more likely to be dissolved into groundwater and be potentially transported from the Site. Those with high water/carbon partitioning coefficients (such as benzo(a)pyrene) are much more likely to become bound to the organic fraction of soils. Chemicals with high vapor pressures such as benzene are likely to volatilize when in contact with air.

In general, PAH compounds tend to have a high affinity for organic compounds and low solubility in water. Therefore, in soils and sediments, PAH compounds tend to be bound to the soil particles and dissolve slowly. Volatilization of some lighter end PAH compounds may occur although most volatilize slowly due to their low vapor pressures. Biodegradation is an important process in that microorganisms are capable of breaking down PAH compounds. According to the Gas Research Institute (Management of Manufactured Gas Plant Sites, 1988) the half-life of most PAH compounds in soil varies from 140 to 480 days under good conditions. The rate of biodegradation is highly dependent upon the availability of oxygen and nutrients in the subsurface and other soil conditions.

Benzene and other VOCs tend to dissolve in groundwater and volatilize in air much more easily than PAH compounds. Therefore, they do not usually last for long periods at the surface but may be persistent in groundwater.

Metals and ferrocyanide, usually the dominant form of cyanide at MGP Sites (Management of Manufactured Gas Plant Sites, 1988), are relatively insoluble and tend to be persistent in soil. They are usually closely bound to particulate matter and may be transported in soil eroded by wind or rain. Over time, oxidation and biological action may cause reaction of sulfur and cyanide compounds to form thiocyanates which are very soluble in water.

## **9.2.2 Potential Routes of Migration**

### **9.2.2.1 Soils**

Surface and subsurface soils at or near identified sources appear to be the first media impacted by the release of MGP constituents. The primary route of migration of MGP-related constituents is movement through subsurface soils by the percolation of rainwater through the vadose zone to the water table. The migration of the COI occurs along preferential pathways where changes in permeability occur. Several key horizons were identified during the CSI which appear to be possible migration pathways including the ground surface, the water table, the base of fill material, the alluvial sands, and the base of alluvium. Constituents can also be moved from place to place on the surface by the erosion of impacted surface soils. Transport of COI from the Site as a result of surface soil erosion is not likely to occur because buildings, asphalt and concrete cover all but approximately 500 square feet (covered by grass) of the former MGP facility, as show in Figure 3.

#### **9.2.2.1.1 Surface Topography**

Surface topography at the Site slopes to the northeast and east. Surface soils at the property contain COI exceeding background concentrations. Surface water runoff would follow surface topography, as discussed in Section 2, to one of the two drainages discussed in Sections 3.2.3 and 9.3.2. However, as mentioned in the previous Section, COIs are not likely to be found in surface water runoff because there are no exposed surface soils at the Site. Therefore, the migration of MGP-related constituents from eroded surface soils or former MGP operations in surface water runoff is not considered to be the potential path of contaminant migration from the Site.

#### **9.2.2.1.2 Water Table**

As soil saturation increases near the water table, permeability to fluids other than water decreases. The result is a vertical change in the conductivity of the soil. Therefore, some migration may be expected to have occurred in a down-gradient direction along the water table. Figure 18 is a map depicting the elevation of the water table.

#### **9.2.2.1.3 Base of the Fill Material**

The clays, sands and gravels of the fill material exhibit a higher conductivity than the underlying clays and silts of the alluvium and saprolite. Therefore, the base of the fill material may be a preferential flow pathway.

#### **9.2.2.1.4 Base of Alluvium**

The medium to coarse sands and gravels observed in the alluvium at the Site has a higher conductivity than the underlying silts and fine sands of the saprolite or of the gneissic bedrock. Therefore, the contact between the base of the alluvium and the underlying saprolite or bedrock could represent a preferential flow pathway.

#### **9.2.2.2 Groundwater**

Groundwater may be impacted by COI when residual MGP constituents in subsurface soil come in contact with the groundwater or when percolating rainwater leaches the COI into the groundwater. The migration of MGP constituents that have been dissolved into the groundwater is directly controlled by the flow direction and flow rate of the groundwater. The distributions of the COI in groundwater are shown in Figure 19.

In any groundwater flow regime there is usually some component of vertical movement of groundwater. Areas where groundwater has some component of downward movement are called recharge areas. Areas where groundwater is moving up (towards the surface) are known as discharge areas. The relationship between monitoring wells MW-4 and MW-6 provides data to determine the general vertical flow characteristics at the Site. The higher groundwater elevation measured in MW-04 (295.67) which is screened across the water table (295.38 to 285.38), versus the elevation measured in MW-06 (283.13) which is screened below the water table (278.76 to 268.76), indicates a downward flow regime or recharge.

### **9.3 POTENTIAL RECEPTORS AT EXPOSURE POINTS**

Exposure points include any areas where MGP constituents are accessible in soils and groundwater to potential human (i.e., children, adult residents, and workers) and/or environmental (i.e., such as plant and animal species) receptors. Potential exposure points at the Site and its vicinity include those areas where local residents, commercial and potential future construction workers come into contact with the COI in soils or groundwater. Commercial and residential workers may potentially be exposed to COI in surface soils whereas construction workers are expected to be mainly exposed to COI detected in subsurface soils during construction or excavation activities that may occur in the

future at the Site. In addition, aquifers impacted by the COI are potential exposure points to humans who may use them as drinking water sources.

### **9.3.1 Water Wells**

A water well survey was conducted by Williams during the CSI for former Macon 2 MGP facility. The water well survey entailed a database search performed by the U.S.G.S. No water wells were found in use within a three-mile radius of the former MGP facility. The area surrounding the Site is served by the municipal water supply which obtains its water from the Ocmulgee River approximately three miles upstream from the Site.

### **9.3.2 Surface Water**

Figure 5 (Site Map and Surface/Storm Water Flow Path) identifies the flow paths of surface water at the Site and at surrounding areas. Storm water at the former MGP property flows to various storm drains located at the facility (Figure 3) or as a sheet flow over the embankment located on the eastern boundary of the property. Storm water that flows towards the embankment accumulates in standing pools on the western side of the Norfolk Southern Railway and eventually seeps through the railway gravel bed and to the Ocmulgee River. Stormwater which falls on up-gradient properties including the Exxon station, Pizza Hut restaurant, Burger King restaurant, and Conoco station, flows into either storm drains that feed into storm drains located at the facility, as surface flow over the embankment previously mentioned, or into a drainage located on the southwestern side of the Spring Street bridge. Storm water that flows into the drainage located on the southwestern side of the Spring Street bridge empties into the Ocmulgee River at a point on the southeastern side of the bridge (Figure 5).

### **9.3.3 Crops and Hunting**

Bibb County contains approximately 24,600 acres of land used for agriculture. The majority of this land is located in the southern portion of the county. However, near the Site, the land is utilized for urban and industrial purposes and, therefore, is not suitable for agriculture. Accordingly, potential exposure through ingestion of crops that might be affected by Site contaminants is not likely.

Several species of wildlife are hunted in Bibb County including fox squirrel, white-tailed deer, bobwhite, quail, and mourning dove. However, hunting is not likely to occur on the Site due to its commercial/industrial setting. Some fishing may occur in the Ocmulgee River although the potential of exposure through fish is expected to be low since the COI related to the Site were detected below Type 1 RRSs in groundwater and they have been delineated prior to entering the river. Therefore, potential human exposure to Site contaminants through ingestion of local wildlife and fish is expected to be low, if at all.

### **9.3.4 Environmental Receptors**

Environmental receptors include plant and animal species that might be exposed to the COI in soil at the Site. The discussion of potential receptors in Appendix M includes a list of species in Bibb County and adjacent counties of

Crawford, Houston, Jones, Monroe, Peach, and Twigs considered by the U.S. Fish and Wildlife Service, Georgia Department of Natural Resources, and the Georgia Natural Heritage Program as threatened, endangered, protected, and/or species of special concern. These species are not likely to inhabit the Site due to its commercial/industrial setting.

#### **9.4 EXPOSURE ROUTES**

Potential exposure routes at the exposure points include incidental ingestion, inhalation and dermal contact with the COI detected in soils and groundwater by potential receptors (i.e., Site workers or residential receptors). The potential exposure of workers and residential populations to COI present in surface soil is limited since most of the area where the COI were found in soils are covered by buildings, asphalt or concrete. In addition, no residences were noted in any of the areas defined as impacted by the COI. Construction workers are the most likely receptors that may potentially be exposed to COI detected in soils through incidental ingestion, dermal contact or inhalation of COI during construction/excavation activities.

Potential human indirect routes of exposure include ingestion by humans of plants or wildlife that have bioaccumulated/biomagnified the COI from surface soils. Indirect exposure at the Site is not likely because no terrestrial wildlife species were observed on the Site. The potential for exposure of terrestrial and aquatic wildlife to COI potentially discharged in groundwater to Ocmulgee River is low because COI related to the Site are not likely to discharge to the River. Overall, the potential for transfer of the contaminants through the food web to humans or ecological receptors is low considering the urban/industrial setting of the Site and the absence of impact of the Site-related groundwater contaminants on the Ocmulgee River.

#### **9.5 HSRA EVALUATION**

Regulated substances identified at a site must be compared with appropriate Risk Reduction Standards (RRSs) as required by HSRA. RRSs are based on property use (i.e., residential or non-residential) and, when applicable, Site-specific conditions. Thirty-five HSRA-regulated substances were detected in soils or groundwater at the Macon 2 former MGP facility during the CSI. The concentrations detected were first compared with Type 1 RRSs (most stringent residential) to determine which chemicals required further evaluation. The following subsections address the evaluation of HSRA regulated substances for compliance with RRSs.

##### **9.5.1 Soils**

###### **9.5.1.1 Calculation of Risk Reduction Standards**

Types 1 through 4 RRSs for soils at the Site were derived to evaluate Site compliance with HSRA regulations (Appendix M). The RRSs and the methods by which they were derived are summarized in Table 9.2. The methods for Types 1 and 3 RRSs include, as applicable, values given in the tables of the HSRA rules (Tables 1 and 2, Appendix III), the appropriate Risk Assessment Guidance for Superfund (RAGS) Equations, or background concentrations. Type 2 RRSs were determined by calculating the appropriate RAGS equations with default exposure assumptions published by

**TABLE 9.2  
RISK REDUCTION STANDARDS FOR SOIL AND  
METHODS USED IN CALCULATIONS**

Constituent	Highest Concentration*		Type 1		Type 2		Type 3			Type 4		
	0-2'	>2'					0-2'	>2'		0-2'	>2'	
<b>VOCs</b>												
Benzene	ND	0.0310	0.500	B	8.37	D	0.500	0.500	B	0.500	0.500	H
Ethylbenzene	ND	ND	70.0	B	139	E	70.0	70	B	70.0	70.0	H
Toluene	ND	0.0100	100	B	514	E	100	100	B	100	100	H
Total Xylenes	ND	0.00550	1,000	B	1,000	E	1,000	1,000	B	1,000	1,000	H
Carbon Disulfide	ND	0.0320	400	B	228	E	400	400	B	400	400	H
Methylene Chloride	ND	ND	0.500	B	96.5	D	0.500	0.500	B	0.500	0.500	H
<b>SVOCs</b>												
Acenaphthene	ND	6.10	300	A	4,690	E	300	300	A	300	300	H
Acenaphthylene	ND	8.80	130	A	2,350	E	130	130	A	130	130	H
Anthracene	ND	33.0	500	A	23,500	E	500	500	A	500	500	H
Benzo(a)anthracene	0.750	37.0	5.00	A	12.5	D	5.00	5.00	A	78.4	120	D/I
Benzo(a)pyrene	0.740	26.0	1.64	A	1.25	D	1.64	1.64	A	7.84	63.3	D/I
Benzo(b)fluoranthene	0.690	27.0	5.00	A	12.5	D	5.00	5.00	A	78.4	298	D/I
Benzo(g,h,i)perylene	0.540	5.00	500	A	2,350	E	500	500	A	500	500	H
Benzo(k)fluoranthene	0.780	28.0	5.00	A	125	D	5.00	5.00	A	5.00	5.00	H
Chrysene	0.770	37.0	5.00	A	1,250	D	5.00	5.00	A	5.00	5.00	H
Dibenzo(a,h)anthracene	ND	3.50	2.00	D	1.25	D	5.00	5.00	A	5.00	5.00	H
Fluoranthene	1.50	68.0	500	A	3,130	E	500	500	A	500	500	H
Fluorene	ND	31.0	360	A	3,130	E	360	360	A	360	360	H
Indeno(1,2,3-cd)pyrene	0.380	15.0	5.00	A	12.5	D	5.00	5.00	A	78.4	924	D
Naphthalene	ND	51.0	100	A	59.9	E	100	100	A	100	100	H
Phenanthrene	1.10	110	110	A	2,350	E	110	110	A	110	110	H
Phenol	ND	ND	400	B	46,900	E	400	400	B	400	400	H
Pyrene	1.10	70.0	500	A	2,350	E	500	500	A	500	500	H
<b>Inorganics</b>												
Arsenic	31.5	7.47	20.0	C	6.08	D	38.1	41.0	D/A	38.1	41.0	H
Barium	119	279	1,000	C	5,430	E	1,000	1,000	C	1,000	1,000	H
Beryllium	ND	ND	2.00	C	156	E	3.00	3.00	A	3.00	3.00	H
Cadmium	ND	ND	2.00	C	78.2	E	39.0	39.0	A	39.0	39.0	H
Chromium	25.0	46.3	100	C	234	E	1,200	1,200	A	1,200	1,200	H
Copper	63.7	89.1	100	C	3,130	E	1,500	1,500	A	1,500	1,500	H
Lead	151	1070	75.0/204	C/F	400	**	400	400	**	1,070	1,070	I
Mercury	0.825	9.43	0.500/0.540	C/F	23.5	E	17.0	17.0	A	17.0	17.0	H
Nickel	8.29	14.4	50.0	C	1,560	E	420	420	A	420	420	H
Vanadium	75.3	79.3	100/120	C/G	548	E	100	100	A	100	100	H
Zinc	160	544	100/257	C/F	23,500	E	2,800	2,800	A	2,800	2,800	H
Total Cyanide	ND	1.44	20.0	B	1,560	E	20.0	20.0	B	20.0	20.0	H

\* - Data from the February/April 2001 sampling event

\*\* - Derived based on the EPA Integrated Exposure Biokinetic Model.

A - Appendix I Notification Requirement

B - Appendix III Table 1 times 100

C - Appendix III Table 2

D - Upperbound excess cancer risk

E - Noncarcinogenic risk

F - Background in fill material

G - Background in natural soils

H - Calculated Type 4 RRS by RAGS was not evaluated for leachability; therefore, defaults to Type 3.

I - Concentration protective of groundwater is less than Type 4 RRS calculated by RAGS, therefore Type 4 has been adjusted to be protective of groundwater.

Values listed in milligrams per kilogram (mg/Kg)

Values rounded to three significant digits

the Georgia EPD or by background concentrations. Type 4 RRSs were determined for COI that exceeded Types 1 through 3 RRSs by calculating RAGS equations for the two exposure scenarios based on depth of soils at the Site. The Type 4 RRSs were additionally evaluated by a leaching potential study (Section 9.5.1.2) to demonstrate the values are protective of groundwater. The lesser of the calculated RRSs by RAGs and the leaching potential study were used as the Type 4 RRS for soil. For COI that did not exceed Types 1 through 3 RRS in soil, the Type 4 RRS was defaulted to a lower type RRS as the COI already meet a more stringent RRS. These COI include all compounds detected in the Site soils except for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and lead.

For surface soils (i.e., soil depth interval of 0-2 feet bgs.), Type 4 RRSs were determined for a commercial worker by calculating the appropriate RAGS equations with default exposure assumptions published by the Georgia EPD or by background concentrations. For subsurface soils (i.e., soil depth interval greater than 2 feet bgs.), Type 4 RRSs were determined by calculating the appropriate RAGS equations with exposure assumptions for a construction worker. Construction activities involve a direct contact with subsurface soils primarily through incidental ingestion of soil and inhalation of volatile compounds and soil particulates. Accordingly, Type 4 RRSs for subsurface soil were derived to be protective of construction workers. Exposure parameters used in derivation of subsurface soil Type 4 RRS are the same as those used in calculating surface soil Type 4 RRS except for frequency of exposure, duration of exposure and incidental soil ingestion rate. In this case, exposure frequency was assumed to be 125 days/year and duration of exposure was selected as 0.5 year as subsurface construction activities at the Site are not expected to last more than 0.5 years. These parameters were selected based on best professional judgment, assuming that moderate construction activities may occur at the Site in the future. Incidental soil ingestion rate for construction workers was set at 330 mg per day, based on the USEPA draft guidance document; Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (USEPA, 2001). A more complete discussion of the calculation of HSRA RRSs along with calculated results of RAGS equations and a list of HSRA table values is included in Appendix M.

Because toxicity values are not available for lead, Type 2 RRSs and Type 4 RRSs were developed based on the USEPA's Integrated Exposure Uptake Model for Lead and Georgia Adult Lead Model (GALM); respectively, using standard assumptions and a Site specific groundwater lead concentration of 0.01 mg/L (refer to Appendix M for discussion of derivation of RRSs for lead). In fact, lead was not detected in groundwater beneath the Site and the detection limit was used as the lead groundwater concentration in the GALM. Compliance with a RRS for a given constituent was not evaluated if the constituent already met a more restrictive RRS (e.g., for a given constituent, compliance with a Type 3 RRS was not evaluated if the compound was in compliance with its Type 2 RRS).

#### **9.5.1.2 Leaching Potential Study**

The COI at the Macon 2 MGP Site were evaluated to determine if concentrations in soil at their respective Type 4 RRS have the potential to leach at concentrations that may cause groundwater concentrations to exceed a Type 4 RRS for groundwater (leachability study). The first step of the leachability study included screening out those COI that did not exceed Types 1, 2, and 3 RRSs in soil since these COI are already in compliance with a more restrictive RRS. For the Macon 2 MGP Site, the only five COI exceeding Types 1 through 3 RRS in soil include: lead, benzo(a)anthracene,

benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene. Additional studies were performed on these COI to determine what concentrations would not cause groundwater to exceed applicable RRSs.

A dilution attenuation factor (DAF) of 20 was utilized in the leachability study for this Site based on the default value provided in the Environmental Protection Agency (EPA) "Soil Screening Guidance: User Guide, Second Edition," July 1996 (SSG). The SSG states that this DAF is protective of sources up to 0.5 acres. As the source areas at the Site are greater than this, a Site-specific value was calculated per the SSG (Table 9.3). The Site-specific calculated value was 86.2, which is greater than the default, therefore the DAF was lowered to the default value to be conservative.

**TABLE 9.3  
CALCULATION OF SITE-SPECIFIC DILUTION ATTENUATION FACTOR**

<b>DAF = 1+(Kd)/(IL)</b>		
Where:		
$d = (0.0112 \cdot L^2)^{0.5} + d_a [1 - \exp(-L)/(Kd_a)]$		
86.2	DAF - Dilution Attenuation Factor (unitless)	Calculated
2,770	K - Aquifer Hydraulic Conductivity (m/yr.)	Site-specific
0.086	i - Hydraulic Gradient (m/m)	Site-specific*
0.178	I - Infiltration Rate (m/yr.)	DRASTIC
7.0	d - Mixing Zone (m)	Calculated (Limited by $d_a$ )
110	L - Source Length Parallel to GW Flow (m)	Site-specific
7.0	$d_a$ - Aquifer Thickness (m)	Site-specific
Notes:		
DRASTIC - DRASTIC: A Standardized System for Evaluating Ground Water Pollution Potential Using Hydrogeologic Setting, EPA, June 1997.		
* - Hydraulic gradient from August 20, 2003 (Figure 18).		
Assumptions - Piedmont Blue Ridge Ground-Water Region; (8D) Regolith; Net Recharge Infiltration Rate (Net Recharge) Range of 0.101 m/yr. to 0.178 m/yr. (4-7 in/yr.).		

**9.5.1.2.1 Lead**

Three soil samples collected from unsaturated soils during the CSI contained concentrations of lead (634 mg/Kg at SB-27-8-12; 425 mg/Kg at SB-45-10-12; and 1,070 mg/Kg at SB-45-15-17) exceeding the maximum of Types 1, 2, and 3 RRS (400 mg/Kg). Since the maximum lead concentration in unsaturated soils at the Site was less than the calculated Type 4 RRS for lead (based on the GALM), samples SB-27-8-12 and SB-45-15-17 were analyzed for lead following synthetic precipitation leaching potential (SPLP) extraction. The SPLP results for sample SB-27-8-12 was 0.038 mg/L and for sample SB-45-15-17 was 0.0808 mg/L. These data were evaluated following protocols presented in the SSG. As stated in the SSG, "To calculate SSLs (soil screening levels) for the migration to groundwater pathway, multiply the acceptable groundwater concentration by the dilution factor to obtain a target soil leachate concentration." Multiplying the acceptable groundwater concentration of 0.015 mg/L (Type 4 groundwater RRS) and the DAF of 20, the target soil leachate concentration equals 0.30 mg/L. The SSG states "if a leach test is used, compare the target soil leachate concentration to the extract concentrations from the leach tests." The lead leachate concentrations from samples SB-27-8-12 and SB-45-15-17 are 0.038 mg/L and 0.0808 mg/L, respectively, which are an order of magnitude below the target soil leachate concentration of 0.30 mg/L. Therefore, for the former Macon 2 MGP Site, the Type 4 soil RRS for lead will equal 1,070 mg/Kg which is the maximum detected lead value in the data set for the Site, meets the target soil leachate concentration evaluation, and does not exceed the calculated Type 4 RRS for lead using the GALM.

**9.5.1.2.2 Semivolatile Organic Compounds**

Soil samples were not collected during the CSI to perform SPLP analysis for SVOCs to be utilized in a leachability study, therefore, an additional step taken from the SSG was used to determine the appropriate concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene in soil that would not cause groundwater to exceed the higher of Types 1 through 4 groundwater RRSs. To determine the target soil leachate for these COI, the acceptable groundwater concentrations (based on RRSs for groundwater) were multiplied by a DAF of 20. Equation 10 (Soil Screening Level Partitioning Equation for Migration to Groundwater) from the SSG was used in lieu of a leach test. Table 9.4 identifies the input values used in this equation and the sources of the data. Based on the input values, concentrations of 38.3 mg/Kg benzo(a)pyrene, 120 mg/Kg benzo(a)anthracene, 298 mg/Kg benzo(b)fluoranthene, and 966 mg/Kg indeno(1,2,3-cd)pyrene in soil will not cause groundwater to exceed the Type 4 groundwater RRS. Therefore, the Type 4 soil construction worker RRS (i.e., soils deeper than 2 feet bgs.) for benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene default to these values, as they are protective of human health based on RAGS calculations and will not cause groundwater concentrations to exceed Type 4 RRSs.

**TABLE 9.4  
CALCULATION OF SOIL SCREENING LEVELS**

<b>SSL = Cw * {Kd + [Ow + (Oa * H')]} / Pb</b>		
<b>Benzo(a)anthracene</b>		
120	SSL - Soil Screening Level (mg/Kg)	Calculated
0.00075	RRS - Groundwater Risk Reduction Standard (mg/L)	Type 4 RRS
20	DAF - Dilution attenuation factor	Soil Screening Guidance, July 1996
0.015	Cw - Target soil leachate conc. (mg/L)	RRS * DAF
8024	Kd - Soil-water partition coefficient (L/Kg)	Koc * foc
4.01E+05	Koc - Soil organic carbon/water partition coefficient (L/Kg)	USEPA, SCDM, June 1996
0.020	foc - Fraction organic carbon in soil (g/g)	GAEPD, Chapter 391-3-19, Appendix III, Table 3
0.19	Ow - Water-filled soil porosity (Lwater/Lsoil)	Site-specific
0.17	Oa - Air-filled soil porosity (Lair/Lsoil)	n - Ow
1.69	Pb - Dry soil bulk density (Kg/L)	Site-specific
0.36	n - Soil porosity (Lpore/Lsoil)	Site-specific
2.65	Ps - Soil particle density (Kg/L)	Site-specific
3.40E-06	H' - Dimensionless Henry's Law constant	USEPA, SCDM, June 1996
<b>Benzo(a)pyrene</b>		
63.3	SSL - Soil Screening Level (mg/Kg)	Calculated
0.0002	RRS - Groundwater Risk Reduction Standard (mg/L)	Type 3 RRS
20	DAF - Dilution attenuation factor	Soil Screening Guidance, July 1996
0.004	Cw - Target soil leachate conc. (mg/L)	RRS * DAF
15820	Kd - Soil-water partition coefficient (L/Kg)	Koc * foc
7.91E+05	Koc - Soil organic carbon/water partition coefficient (L/Kg)	USEPA, SCDM, June 1996
0.020	foc - Fraction organic carbon in soil (g/g)	GAEPD, Chapter 391-3-19, Appendix III, Table 3
0.19	Ow - Water-filled soil porosity (Lwater/Lsoil)	Site-specific
0.17	Oa - Air-filled soil porosity (Lair/Lsoil)	n - Ow
1.69	Pb - Dry soil bulk density (Kg/L)	Site-specific
0.36	n - Soil porosity (Lpore/Lsoil)	Site-specific
2.65	Ps - Soil particle density (Kg/L)	Site-specific
1.10E-04	H' - Dimensionless Henry's Law constant	USEPA, SCDM, June 1996

**TABLE 9.4  
CALCULATION OF SOIL SCREENING LEVELS (CONTINUED)**

<b>SSL = Cw * {Kd + [Ow + (Oa * H')] / Pb}</b>		
<b>Benzo(b)fluoranthene</b>		
298	<b>SSL - Soil Screening Level (mg/Kg)</b>	<b>Calculated</b>
0.00075	RRS - Groundwater Risk Reduction Standard (mg/L)	Type 4 RRS
20	DAF - Dilution attenuation factor	Soil Screening Guidance, July 1996
0.015	Cw - Target soil leachate conc. (mg/L)	RRS * DAF
19843	Kd - Soil-water partition coefficient (L/Kg)	Koc * foc
9.92E+05	Koc - Soil organic carbon/water partition coefficient (L/Kg)	USEPA, SCDM, June 1996
0.020	foc - Fraction organic carbon in soil (g/g)	GAEPD, Chapter 391-3-19, Appendix III, Table 3
0.19	Ow - Water-filled soil porosity (Lwater/Lsoil)	Site-specific
0.17	Oa - Air-filled soil porosity (Lair/Lsoil)	n - Ow
1.69	Pb - Dry soil bulk density (Kg/L)	Site-specific
0.36	n - Soil porosity (Lpore/Lsoil)	Site-specific
2.65	Ps - Soil particle density (Kg/L)	Site-specific
1.10E-04	H' - Dimensionless Henry's Law constant	USEPA, SCDM, June 1996
<b>Indeno(1,2,3-cd)pyrene</b>		
924	<b>SSL - Soil Screening Level (mg/Kg)</b>	<b>Calculated</b>
0.00075	RRS - Groundwater Risk Reduction Standard (mg/L)	Type 4 RRS
20	DAF - Dilution attenuation factor	Soil Screening Guidance, July 1996
0.015	Cw - Target soil leachate conc. (mg/L)	RRS * DAF
61600	Kd - Soil-water partition coefficient (L/Kg)	Koc * foc
3.08E+06	Koc - Soil organic carbon/water partition coefficient (L/Kg)	USEPA, SCDM, June 1996
0.020	foc - Fraction organic carbon in soil (g/g)	GAEPD, Chapter 391-3-19, Appendix III, Table 3
0.19	Ow - Water-filled soil porosity (Lwater/Lsoil)	Site-specific
0.17	Oa - Air-filled soil porosity (Lair/Lsoil)	n - Ow
1.69	Pb - Dry soil bulk density (Kg/L)	Site-specific
0.36	n - Soil porosity (Lpore/Lsoil)	Site-specific
2.65	Ps - Soil particle density (Kg/L)	Site-specific
1.60E-06	H' - Dimensionless Henry's Law constant	USEPA, SCDM, June 1996

### 9.5.1.3 Compliance With Risk Reduction Standards

An evaluation of the COI detected in the Site soils with regards to Types 1 through 4 RRSs is presented in Table 9.5. Concentrations of all six detected VOCs (benzene, carbon disulfide, ethylbenzene, methylene chloride, toluene and total xylenes), ten PAHs (acenaphthene, acenaphthylene, anthracene, benzo(g,h,i)pyrene, fluoranthene, fluorene, naphthalene, phenanthrene, phenol and pyrene), seven metals (barium, beryllium, cadmium, chromium, copper, nickel and vanadium) and cyanide did not exceed Type 1 RRS. Type 3 RRSs for soils deeper than 2 feet bgs were exceeded by four PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene) and lead. None of the COIs detected in the Site soils exceeded Type 4 RRSs. The areas in which RRSs are exceeded in soil are shown on Figure 20.

**TABLE 9.5  
RISK REDUCTION STANDARD EXCEEDANCES IN SOIL**

Constituent	Type 1	Type 2	Type 3	Type 4
<b>VOCs</b>				
Benzene	N	*	*	*
Ethylbenzene	N	*	*	*
Toluene	N	*	*	*
Total Xylenes	N	*	*	*
Methylene Chloride	N	*	*	*
Carbon Disulfide	N	*	*	*
<b>SVOCs</b>				
Acenaphthene	N	*	*	*
Acenaphthylene	N	*	*	*
Anthracene	N	*	*	*
Benzo(a)anthracene	Y	Y	Y	N
Benzo(a)pyrene	Y	Y	Y	N
Benzo(b)fluoranthene	Y	Y	Y	N
Benzo(k)fluoranthene	Y	N	*	*
Benzo(g,h,i)perylene	N	*	*	*
Chrysene	Y	N	*	*
Dibenzo(a,h)anthracene	Y	Y	N	*
Fluoranthene	N	*	*	*
Fluorene	N	*	*	*
Indeno (1,2,3-cd)pyrene	Y	Y	Y	N
Naphthalene	N	*	*	*
Phenanthrene	N	*	*	*
Phenol	N	*	*	*
Pyrene	N	*	*	*
<b>Inorganics</b>				
Arsenic	Y	Y	N	*
Barium	N	*	*	*
Beryllium	N	*	*	*
Cadmium	N	*	*	*
Chromium	N	*	*	*
Copper	N	*	*	*
Lead	Y	Y	Y	N
Mercury	Y	N	*	*
Nickel	N	*	*	*
Vanadium	N	*	*	*
Zinc	Y	N	*	*
Total Cyanide	N	*	*	*
Y - Yes; exceeds RRS. N - No; does not exceed RRS. * - Constituent meets more restrictive RRS.				

### 9.5.2 Groundwater

Types 1 through 4 RRSs for groundwater at the Site were derived in accordance with HSRA requirements and are summarized in Table 9.6. Calculations for the RRSs are attached in Appendix M. The Types 1 and 3 RRSs are based on the concentrations listed in Table 1, Appendix III of the HSRA regulations. Also, for Types 1 and 3, the sum of regulated substances in a single sample must not exceed 10 mg/L if the Table 1 value for each compound is less than 5 mg/L. If at least one compound has a Table 1 value greater than or equal to 5 mg/l, the sum of concentrations must not exceed the maximum Table 1 value plus 10 mg/l.

Types 2 and 4 RRSs are based on the lesser of the concentrations calculated by using RAGS equations 1 and 2 with default residential (Type 2) and non-residential (Type 4) exposure assumptions published by the Georgia EPD. A discussion of the calculation of the RRSs and a table of RAGS equations results for each constituent are shown in Appendix M. Compliance with a RRS for a given constituent was not evaluated if the constituent already met a more

restrictive RRS (e.g., for a given constituent, compliance with a Type 3 RRS was not evaluated if the constituent was in compliance with its Type 2 RRS).

Groundwater data collected during the CSI, August 2003 sampling event at the Site were used in evaluating compliance with the RRSs. Compliance of each COI detected in groundwater beneath the Site with RRSs is presented in Table 9.7. All COI detected in groundwater beneath the Site did not exceed any of the Types of RRSs.

**TABLE 9.6  
RISK REDUCTION STANDARDS FOR GROUNDWATER  
AND METHODS USED IN CALCULATION**

Constituent	Highest Concentration*	Type 1/3		Type 2		Type 4	
<b>VOCs</b>							
Benzene	ND	0.00500	A	0.00545	D	0.0088	C
Ethylbenzene	ND	0.700	A	0.0582	D	0.0734	D
Toluene	ND	1.00	A	0.221	D	1.10	D
Total Xylenes	ND	10.0	A	31.3	D	204	D
Carbon Disulfide	ND	4.00	A	0.329	D	1.70	D
Methylene Chloride	ND	0.00500	A	0.0622	C	0.119	C
Methyl-tert-butyl-ether	NA	DL	B	1.79	D	8.76	D
<b>SVOCs</b>							
Acenaphthene	0.014	2.00	A	0.939	D	6.13	D
Acenaphthylene	ND	DL	B	0.469	D	3.07	D
Anthracene	ND	DL	B	4.69	D	30.7	D
Benzo(a)anthracene	ND	0.000100	A	0.000450	C	0.000747	C
Benzo(a)pyrene	ND	0.000200	A	0.000450	C	0.000747	C
Benzo(b)fluoranthene	ND	0.000200	A	0.000450	C	0.000747	C
Benzo(g,h,i)perylene	ND	DL	B	0.469	D	3.07	D
Benzo(k)fluoranthene	ND	DL	B	0.00450	C	0.00747	C
Chrysene	ND	DL	B	0.0450	C	0.0747	C
Dibenzo(a,h)anthracene	ND	0.000300	A	0.000450	C	0.000747	C
Fluoranthene	ND	1.00	A	0.626	D	4.09	D
Fluorene	ND	1.00	A	0.626	D	4.09	D
Indeno(1,2,3-cd)pyrene	ND	0.000400	A	0.000450	C	0.000747	C
Naphthalene	ND	0.0200	A	0.00187	D	0.00916	D
Phenanthrene	ND	DL	B	0.469	D	3.07	D
Phenol	ND	4.00	A	9.39	D	61.3	D
Pyrene	ND	1.00	A	0.469	D	3.07	D
<b>Inorganics</b>							
Arsenic	ND	0.0500	A	0.000568	C	0.00191	C
Barium	1.85	2.00	A	1.10	D	7.15	D
Beryllium	ND	0.00500	A	0.0313	D	0.204	D
Cadmium	ND	0.00500	A	0.00782	C	0.0511	C
Chromium	ND	0.100	A	0.0469	D	0.307	D
Copper	ND	1.30	A	0.626	D	4.09	D
Lead	ND	0.0150	A	0.0150	A	0.0150	A
Mercury	ND	0.00200	A	0.00469	D	0.0307	C
Nickel	ND	0.100	A	0.313	D	2.04	D
Vanadium	ND	0.200	A	0.110	D	0.715	D
Zinc	ND	2.00	A	4.69	D	30.7	D
Total Cyanide	0.048	0.200	A	0.313	D	2.04	D
<p>*- Data from the August 2003 sampling event  A - Appendix III Table 1  B - Detection limit  C - Upperbound excess cancer risk  D - Noncarcinogenic risk  Values listed in milligrams per liter (mg/L)  Values rounded to three significant digits</p>							

**TABLE 9.7  
RISK REDUCTION STANDARD EXCEEDANCES IN GROUNDWATER -  
AUGUST 2003 SAMPLING EVENT**

Constituent	Type 1	Type 2	Type 3	Type 4
<b>VOCs</b>				
Benzene	N	*	*	*
Ethylbenzene	N	*	*	*
Toluene	N	*	*	*
Total Xylenes	N	*	*	*
Carbon Disulfide	N	*	*	*
Methylene Chloride	N	*	*	*
Methyl-tert-butyl-ether	N	*	*	*
<b>SVOCs</b>				
Acenaphthene	N	*	*	*
Acenaphthylene	N	*	*	*
Anthracene	N	*	*	*
Benzo(a)anthracene	N	*	*	*
Benzo(a)pyrene	N	*	*	*
Benzo(b)fluoranthene	N	*	*	*
Benzo(g,h,i)perylene	N	*	*	*
Benzo(k)fluoranthene	N	*	*	*
Chrysene	N	*	*	*
Dibenzo(a,h)anthracene	N	*	*	*
Fluoranthene	N	*	*	*
Fluorene	N	*	*	*
Naphthalene	N	*	*	*
Phenanthrene	N	*	*	*
Phenol	N	*	*	*
Pyrene	N	*	*	*
<b>Inorganics</b>				
Arsenic	N	*	*	*
Barium	N	*	*	*
Beryllium	N	*	*	*
Cadmium	N	*	*	*
Chromium	N	*	*	*
Copper	N	*	*	*
Lead	N	*	*	*
Mercury	N	*	*	*
Nickel	N	*	*	*
Vanadium	N	*	*	*
Zinc	N	*	*	*
Total Cyanide	N	*	*	*
Y - Yes; exceeds RRS. N - No; does not exceed RRS. * - Constituent meets more restrictive RRS.				

**SECTION 10**  
**CORRECTIVE ACTION FEASIBILITY**  
**INFORMATION**

## **SECTION 10**

# **CORRECTIVE ACTION FEASIBILITY INFORMATION**

---

The property owned by the City of Macon is partially encompassed by a security fence. The property is accessible by vehicle through two gates which are closed and locked at nights and on weekends and which control access to the property.

### **10.1 POTENTIAL SOURCE MATERIAL**

Figure 11 indicates the horizontal distribution of TLM and/or OLM at the Site. The only observed potential source material was located within the two gas holders and consisted of limited amounts of TLM and/or OLM. As described in Section 2.5.1, within both of these holders, no more than one-inch of TLM and/or OLM was observed and therefore the material appears to be minimal. A sample (GH-2-41) of the most visibly concentrated TLM and/or OLM observed at the Site was collected and analyzed for VOCs and SVOCs. Based on the analytical results of the sample, this material does not appear to meet the definition of source material. Additionally, HSRA regulation 391-3-19-.07(9)(a) states "all source materials must be removed or decontaminated to Type 4 media criteria." The total results from sample GH-2-41 (Appendix C-2) indicate that this material already meets Type 4 or more restrictive RRSs. Based on this and that the only TLM and/or OLM observed at the Site was within the holders, no remedial actions will be required at the Site with respect to potential source material.

### **10.2 SOILS**

As discussed in Section 9, soils at the Site are in compliance with Type 4 or more restrictive RRSs. Therefore, no remedial actions will be required to certify the Site in compliance with Type 4 RRSs with regard to soils.

### **10.3 GROUNDWATER**

Groundwater at the Site is in compliance with all RRSs. Therefore, no remedial actions will be required to certify the Site in compliance with Type 1 RRSs with regards to groundwater.

### **10.4 CORRECTIVE ACTION**

As previously noted, the Site is in compliance with Type 4 RRSs. Upon the Director's concurrence with the Type 4 certification, the following corrective action requirements will be implemented:

- GPC, AGLC, and the City of Macon will submit a monitoring program to the EPD to assure compliance with Section 391-3-19-.07(9)(b); and
- GPC, AGLC, and the City of Macon will make the required property notices as specified under Section 391-3-19-.08(1) and (2).

**SECTION 11**  
**QUALITY ASSURANCE/QUALITY CONTROL**

---

## **SECTION 11**

# **QUALITY ASSURANCE/QUALITY CONTROL**

---

During the field work of the CSI, certain procedures were followed to:

- insure that laboratory methods are within control limits;
- verify the quality of data collected during field measurements; and
- insure that cross contamination has not occurred during sample collection or sample transport.

### **11.1 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL CHECKS**

Analytical Environmental Services, Inc. was used to perform laboratory analyses for this CSI and is an accredited National Environmental Laboratory Accreditation Program laboratory (certificate number E87582). A complete CLP-like data package was prepared by AES for one SDG containing soil samples and one SDG containing groundwater samples collected during the CSI. The data packages were submitted to Southern Company Chemical Services, Norcross, Georgia, for data validation using USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, 1994, and Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, 1994. Southern Company Chemical Services indicated that all laboratory data for the soil and groundwater samples were acceptable. Southern Company Chemical Services also reviewed the laboratory data for precision, accuracy, representativeness, compatibility and completeness (PARCC) parameters. Southern Company Chemical Services found the PARCC parameters acceptable. A copy of Southern Company Chemical Services' report is included in Appendix G-1

Internal laboratory quality control checks were conducted by Williams to monitor data integrity for each SDG. These checks included evaluating method blanks, matrix spikes, matrix spike duplicates, blank spikes, internal standards, surrogate standards, calibration standards, and reference standards. Laboratory data precision for organic analyses was monitored through the use of matrix spike/matrix spike duplicate sample analyses. For other parameters, laboratory data precision was monitored through the use of field duplicates and/or laboratory duplicates. A relative percent difference (RPD) between the replicated samples was calculated. All RPDs were within the laboratory established limits except where noted in the Williams Laboratory QA/QC reports included in Appendix G-2.

Laboratory accuracy was assessed with the use of matrix spikes, surrogate spikes and reference standards. Accuracy was measured in terms of percent recovery. Percent recoveries were within laboratory established limits except where noted in the Williams Laboratory QA/QC report included in Appendix G-2.

### **11.2 FIELD OPERATIONS QUALITY ASSURANCE/QUALITY CONTROL CHECKS**

Field performance was monitored by the Field Manager during the CSI field investigation. Field instrumentation, including the PID and water field measurement equipment were calibrated each morning prior to use and generally each afternoon using supplied standards to insure that the equipment was functioning properly and measurements were

accurate. Results of the calibrations were recorded in the calibration log. An internal audit was conducted on March 2, 2001, by the Quality Assurance Officer to verify that field measurements and field meter calibrations were taken according to established protocol and that work being performed was consistent with the Work Plan. The QAO also reviewed all field reports and drilling logs to determine if field documentation was appropriate and complete. The QAO also reviewed the duplicate, rinse and trip blank data to identify any deficiencies in field sampling, handling or decontamination procedures. A Field Operations System Audit Checklist, reports the results of the internal audit and is included in Appendix G-3. All field operations were conducted according to the Work Plan and standard procedures except where noted in the checklist.

A rinse blank sample was collected for each SDG to monitor the cleanliness of the sampling equipment and the effectiveness of the cleaning procedures. Rinse blanks were taken using organic-free water which was supplied by the laboratory and were analyzed for COI. Barium was detected in five rinse blank samples at very low concentrations. Chromium and lead were detected in one rinse blank sample at concentrations just above the detection limits. Copper was detected in one rinse blank sample just above the detection limit. Based on the low concentrations of these COI reported in the rinse blank samples, it is unlikely that analytical results of the collected soil or groundwater were affected by the sampling equipment. The equipment from which the samples were collected and analytical results for the rinse blank samples are reported in Appendix F.

A trip blank was also collected for each SDG to assess whether cross-contamination may have occurred during sample storage and transport. Trip blanks were supplied by the laboratory in appropriately preserved containers and analyzed for VOCs only. All concentrations of VOCs in trip blank samples were below detection limits. Analytical results for the trip blank samples are included in Appendix F.

Field blanks were collected for each SDG to determine if contaminants present in the sampling area may have had an affect on sample integrity. Field blanks were collected with organic-free water and containerized in 40-milliliter vials preserved with hydrochloric acid. Field blanks accompanied the applicable SDG and were analyzed for VOCs. All concentrations of VOCs in field blank samples were reported below detection limits. Analytical results for the field blank samples are included in Appendix F.

A sample of potable water was collected at the beginning of the field investigation for analysis of the Site COI. The potable water sample (TAP WATER) was collected from the source that supplied water for DPT and HSA equipment decontamination to determine if decontamination procedures could affect sample analytical results. VOC and SVOC concentrations in the tap water sample were reported below detection limits. Barium and copper were reported in the tap water sample at concentrations just above their respective detection limits and it is not believed these results would affect the integrity of the analytical results for the soil and groundwater samples collected at the Site.

**SECTION 12**  
**REFERENCES**

## SECTION 12

# REFERENCES

---

Management of Manufactured Gas Plant Sites, Volume I, Wastes and Chemicals of Interest, Gas Research Institute (GRI), 1987.

Management of Manufactured Gas Plant Sites, Volume III, Risk Assessment, Gas Research Institute (GRI), 1988.

Geology and Ground-Water Resources of the Macon Area, Georgia, H. E. LeGrand, Georgia Geologic Survey Bulletin 72, 1962.

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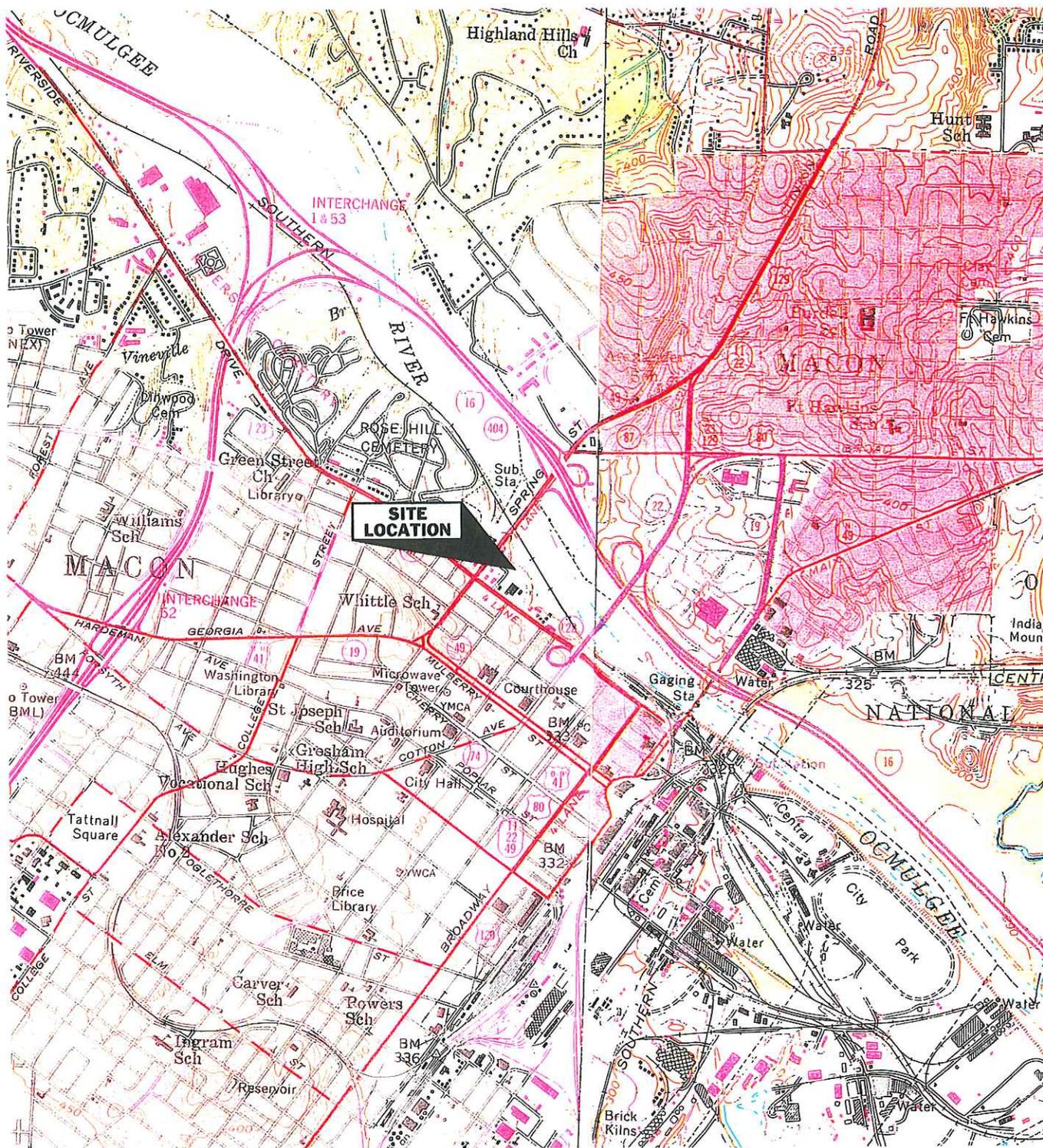
### **For Background Statistics:**

"Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites." Breckenridge, R. P., and Crockett, A. B. (1995). U.S. Environmental Protection Agency. Washington, D. C.

"Statistical Analysis of Groundwater Monitoring Data At RCRA Facilities - Addendum to Interim Final Guidance." EPA. (1992). U.S. Environmental Protection Agency. Washington, D. C.

### **For Hazardous Waste Determination:**

"SW-846. Test Methods for Evaluating Solid Waste." EPA. (1986). U.S. Environmental Protection Agency. Washington, D. C.



**DRAFT**

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	06/25/2001
PROJ. NUMBER	1100-2990
FIGURE NO.	1

SITE LOCATION MAP

FORMER MACON 2 MGP FACILITY  
GPC/AGLC/CITY OF MACON  
MACON, GEORGIA

Prepared By:

**WILLIAMS ENVIRONMENTAL SERVICES, INC.**

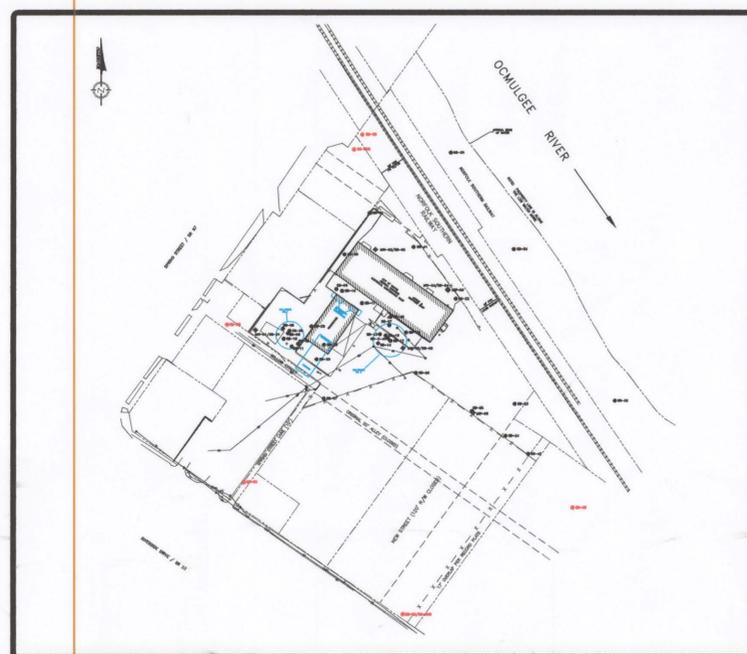
A Williams Group International Company  
600 Chase Park South, Suite 160, Birmingham, Alabama 35244  
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# COMPLIANCE STATUS REPORT

## FORMER MACON 2 MGP FACILITY, MACON, GEORGIA

### REVISED - SEPTEMBER 05, 2003



SITE INSET

SHEET NO.	DRAWING TITLE
2	PROPERTY BOUNDARY MAP
3	SITE MAP
7	CROSS - SECTION A-A'
8	CROSS - SECTION B-B'
9	CROSS - SECTION C-C'
11	VISUAL INDICATIONS OF TLM AND OLM IN SOILS
12	TOTAL DETECTED BENZENE AND VOCs IN SOIL
13	TOTAL DETECTED NAPHTHALENE AND SVOCs IN SOIL
14	BARIUM AND VANADIUM IN SOILS
15	LEAD AND MERCURY IN SOILS
16	ARSENIC, COPPER, AND ZINC IN SOILS
17	CHROMIUM AND CYANIDE IN SOILS
18	WATER TABLE ELEVATION MAP FOR AUGUST 20, 2003
19	TOTAL DETECTED ACENAPHTHENE, CYANIDE, AND BARIUM GROUNDWATER AUGUST 2003
20	AREAS EXCEEDING RISK REDUCTION STANDARDS IN SOIL

DRAWING INDEX

*prepared by:*

## WILLIAMS ENVIRONMENTAL SERVICES, INC.

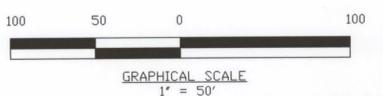
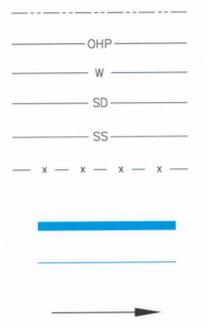
**Consulting Engineers and Scientists**

500 CHASE PARK SOUTH - SUITE 150  
BIRMINGHAM, ALABAMA 35244-1869



### LEGEND

- PROPERTY LINE
- OVERHEAD POWER
- EXISTING WATER LINE
- STORM SEWER
- SANITARY SEWER
- CHAIN LINK FENCE
- PROPERTY LINES
- FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT)
- DIRECTION OF RIVER FLOW



NO.	DATE	REVISIONS	BY

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PROPERTY BOUNDARY MAP

FORMER MACON 2 MGP FACILITY  
 MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
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DATE	09/05/2003
FILENAME	FIGURE-2.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	2



OCMULGEE RIVER

### LEGEND

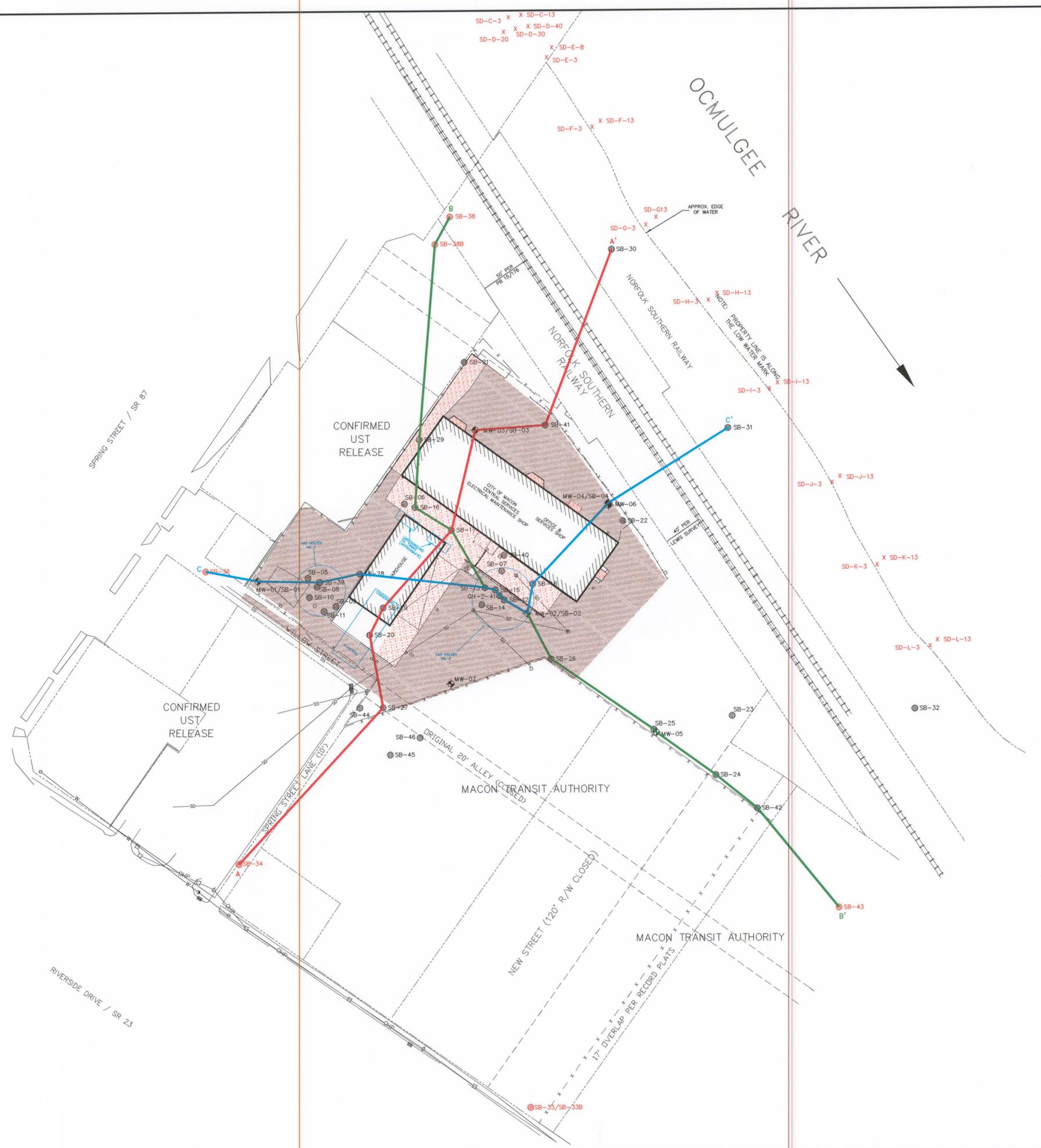
- PROPERTY LINE
- OVERHEAD POWER
- EXISTING WATER LINE
- STORM SEWER
- SANITARY SEWER
- CHAIN LINK FENCE
- MONITORING WELL LOCATION
- SOIL BORING LOCATION
- BACKGROUND SOIL BORING LOCATION (DEFINES MAXIMUM EXTENT)
- FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT)
- CONCRETE
- ASPHALT
- APPROXIMATE SEDIMENT SAMPLE LOCATION

SOIL BORINGS	
LOCATION	GROUND ELEVATION*
SB-01	326.45
SB-02	318.34
SB-03	317.55
SB-04	318.88
SB-05	322.70
SB-06	320.30
SB-07	317.40
SB-8	322.80
SB-9	322.47
SB-10	323.50
SB-11	323.30
SB-12	318.55
SB-13	318.84
SB-14	318.79
SB-15	318.75
SB-16	317.96
SB-17	319.53
SB-18	316.10
SB-19	320.06
SB-20	320.92
SB-21	316.78
SB-22	318.69
SB-23	317.68
SB-24	317.16
SB-25	316.88
SB-26	317.13
SB-27	318.67
SB-28	320.83
SB-29	316.95
SB-30	290.73
SB-31	288.90
SB-32	289.68
SB-33/SB-33B	318.48
SB-34	329.67
SB-36	334.10
SB-38	295.52
SB-38B	305.40
SB-39	322.49
SB-40	316.04
SB-41	317.47
SB-42	317.78
SB-43	318.28
SB-44	322.49
SB-45	318.99
SB-46	318.65

MONITORING WELLS		
LOCATION	GROUND ELEVATION	TOC ELEVATION
MW-01	326.45	325.84
MW-02	318.34	317.87
MW-03	317.55	317.09
MW-04	318.88	318.42
MW-05	316.99	316.62
MW-06	318.76	318.41
MW-07	318.33	318.07



\* IN FEET ABOVE MEAN SEA LEVEL



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SITE MAP

FORMER MACON 2 MGP FACILITY  
 MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
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DATE	09/05/2003
FILENAME	FIGURE-3.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	3

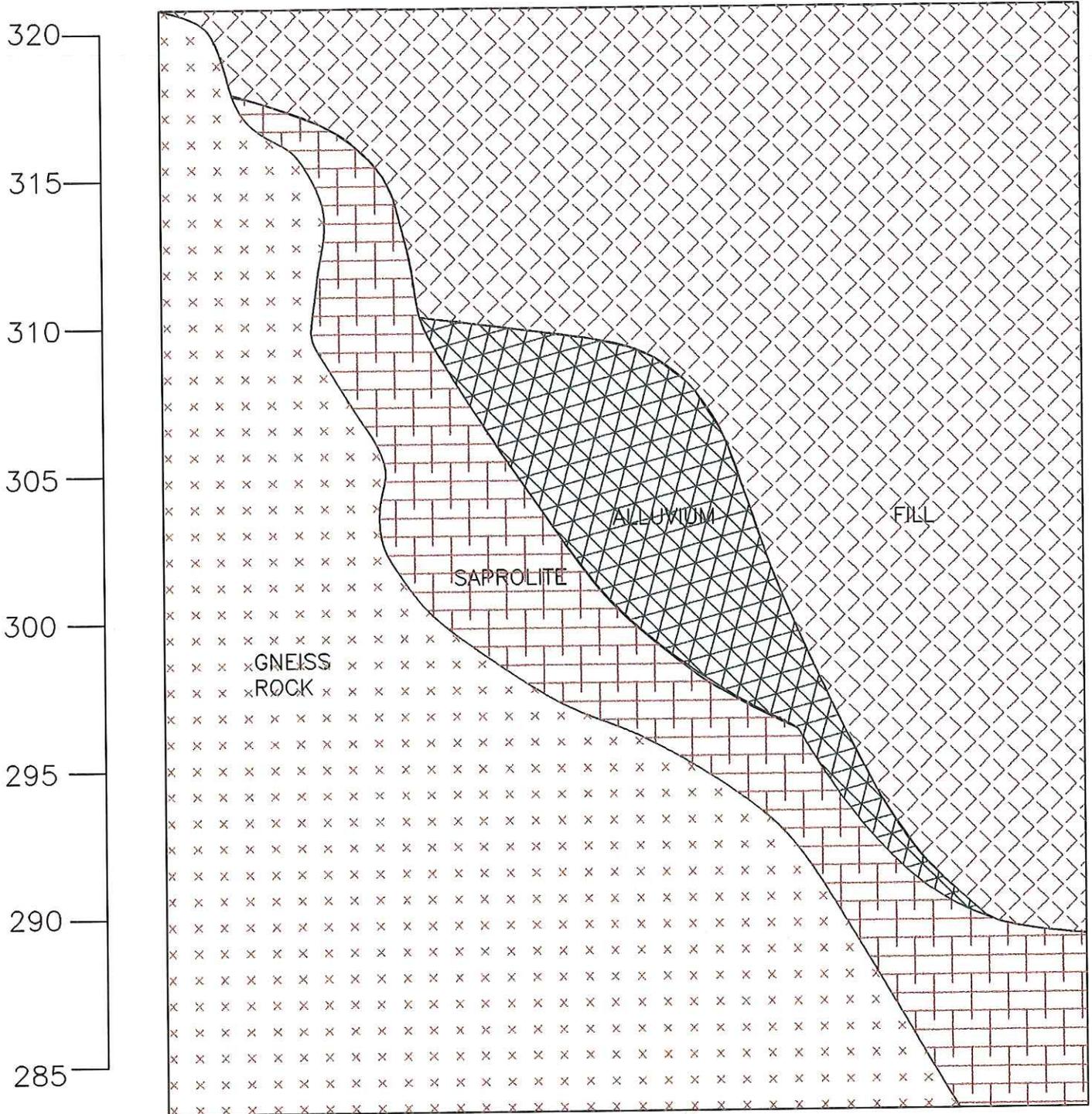




ELEVATION (FEET ABOVE  
MEAN SEA LEVEL)

W

E



NOTE: DEPTH AND THICKNESSES OF LITHOLOGIC UNITS ARE APPROXIMATE

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	06/25/2001
PROJ. NUMBER	-
FIGURE NO.	6

GENERAL CROSS - SECTION

FORMER MACON 2 MGP FACILITY  
GPC/AGLC/CITY OF MACON  
MACON, GEORGIA

Prepared By:

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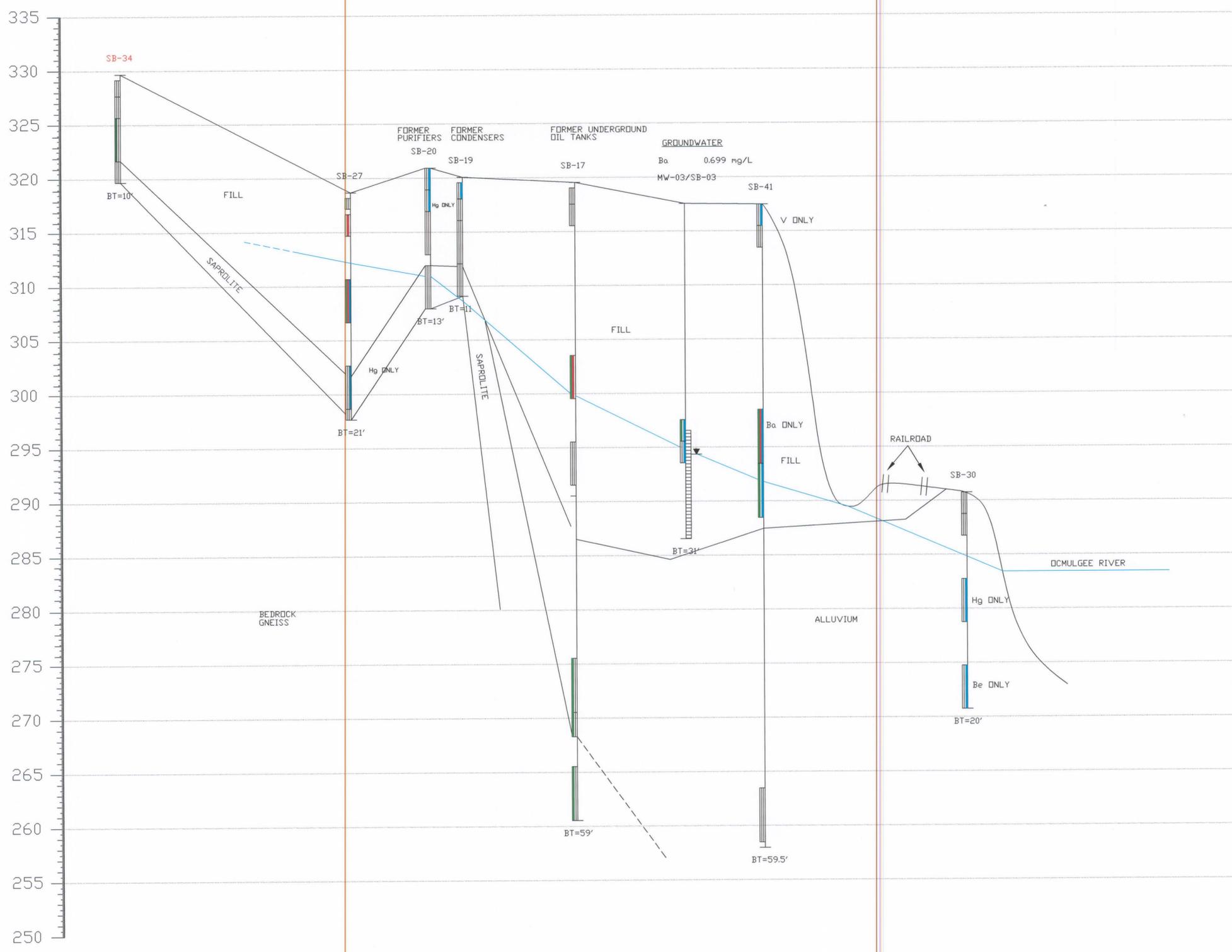
SOUTHWEST  
A

NORTHEAST  
A'

Explanation

- BT=25' - Boring termination (feet below ground surface)
- MW-03/SB-03 - Well/boring/sample designation
- Ba 0.699 mg/L - COI detected in groundwater and concentration (August 2003)

- Water Table (measured March 29, 2001)
- Top of water table (Based on Water Table Elevation Map for March 29, 2001)
- Concentration of VOCs in the soil exceeding upper background limit (UBL)
- Concentration of SVOCs in the soil exceeding UBL
- Concentration of inorganics in soil exceeding UBL
- Not analyzed
- Blank cells indicate sample did not exceed background
- Screened interval



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CROSS SECTION A - A'

FORMER MACON 2 MGP FACILITY  
MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	09/05/2003
FILENAME	FIGURE-7.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	7

HORIZONTAL SCALE 1" = 50'  
VERTICAL SCALE 1" = 5'



WEST  
C

EAST  
C'

Explanation

GROUNDWATER  
BENZENE 9.1 ug/L  
Zn 0.0290 mg/L

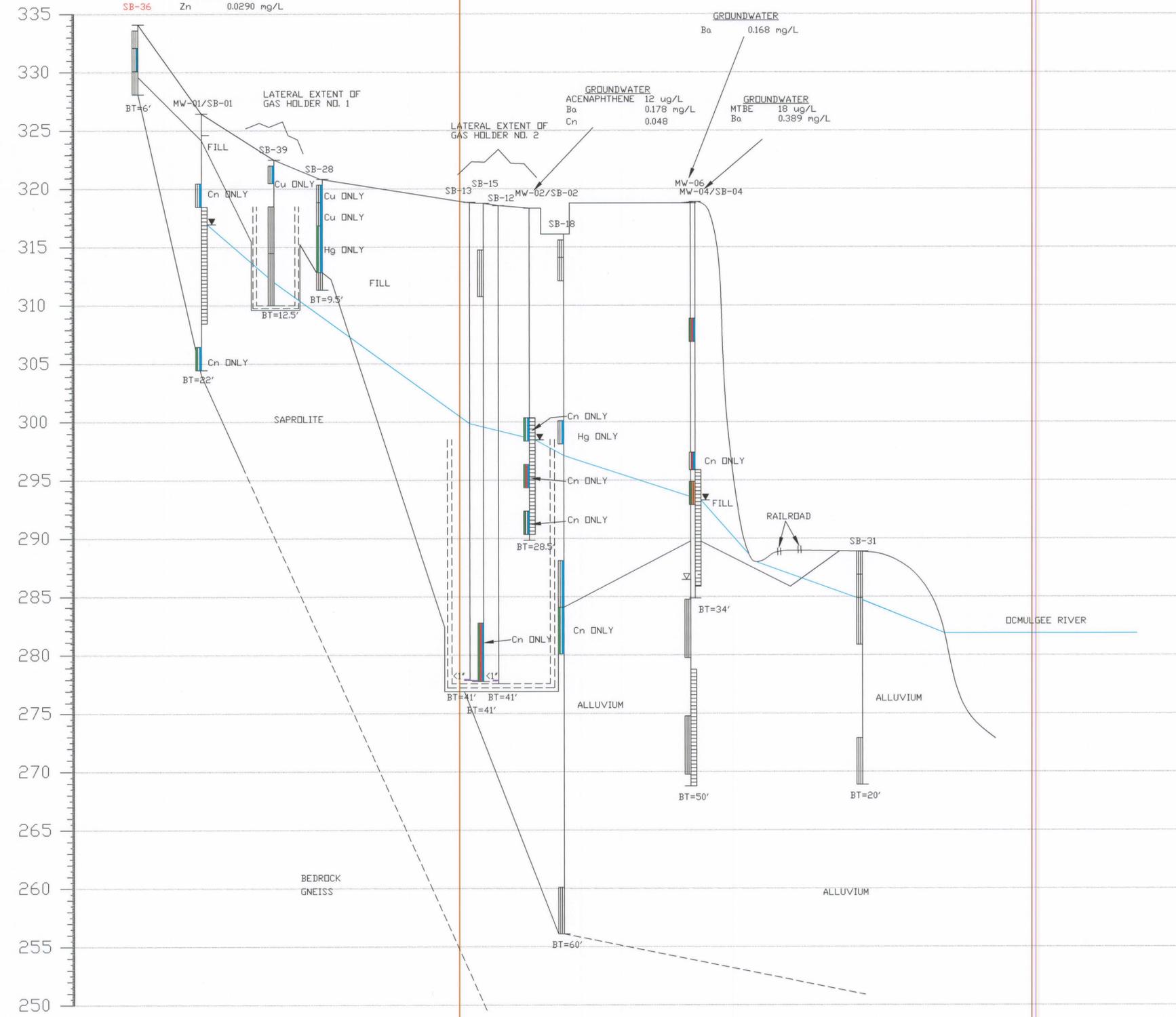
GROUNDWATER  
Ba 0.168 mg/L

GROUNDWATER  
ACENAPHTHENE 12 ug/L  
Ba 0.178 mg/L  
Cn 0.048

GROUNDWATER  
MTBE 18 ug/L  
Ba 0.389 mg/L

- BT=25' - Boring termination (feet below ground surface)
- MW-01/SB-15 - Well/boring/sample designation
- Ba 0.178 mg/L - Only COI detected in groundwater and concentration (August 2003)

- Water Table (measured March 29, 2001)
- Potentiometric surface in intermediate well
- Top of water table (Based on Water Table Elevation Map for March 29, 2001)
- Visual observations of Tar-Like material and/or Oil-Like material
- Concentration of VOCs in the soil exceeding upper background limit (UBL)
- Concentration of SVOCs in the soil exceeding UBL
- Concentration of inorganics in soil exceeding UBL
- Not analyzed
- Blank cells indicate sample did not exceed background
- Screened interval



NO.	DATE	REVISIONS	BY

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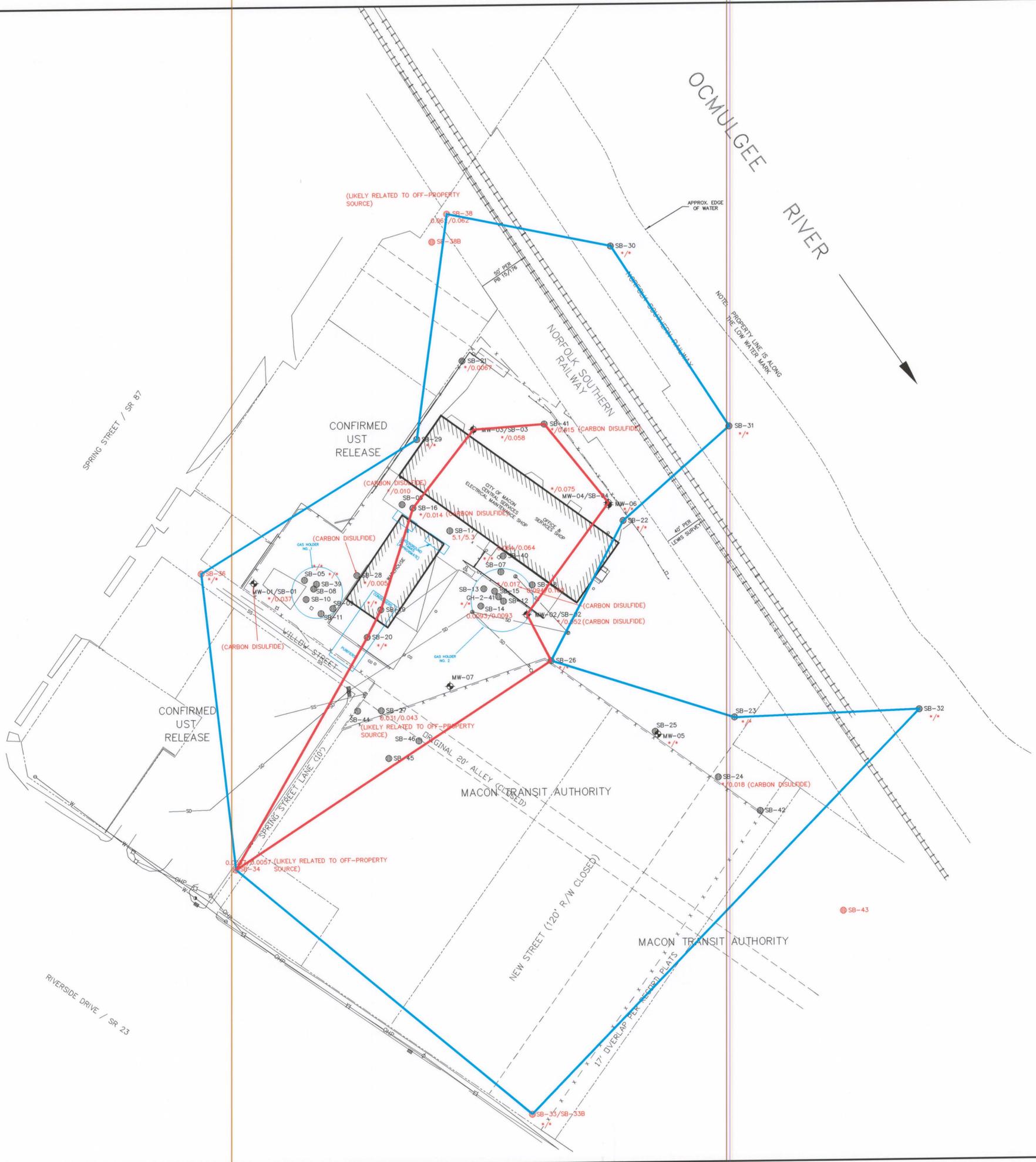
CROSS SECTION C - C'

FORMER MACON 2 MGP FACILITY  
 MACON, GEORGIA

ENGINEERS' SEAL

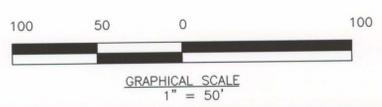
DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	09/05/2003
FILENAME	FIGURE-9.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	9

HORIZONTAL SCALE 1" = 50'  
 VERTICAL SCALE 1" = 5'



### LEGEND

- PROPERTY LINE ---
  - OVERHEAD POWER — OHP —
  - EXISTING WATER LINE — W —
  - STORM SEWER — SD —
  - SANITARY SEWER — SS —
  - CHAIN LINK FENCE - x - x - x - x -
  - MONITORING WELL LOCATION ⊕ MW-6
  - SOIL BORING LOCATION ⊕ SB-22
  - BACKGROUND SOIL BORING LOCATION ⊕ SB-33
  - FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT) ○
  - HIGHEST CONCENTRATION OF BENZENE IN SOIL EXCEEDING UPPER BACKGROUND LIMIT (UBL; mg/kg) 0.031/0.043
  - HIGHEST CONCENTRATION OF TOTAL VOCs IN SOIL EXCEEDING UBL (mg/kg) 0.031/0.043
  - UBL ISOCONCENTRATION LINE OF BENZENE IN SOIL DRAWN TO POINTS WHERE BENZENE IS KNOWN TO BE BELOW BACKGROUND (DETECTION LIMIT) —
  - UBL ISOCONCENTRATION LINE OF VOCs IN SOIL DRAWN TO POINTS WHERE VOCs ARE KNOWN TO BE BELOW BACKGROUND (DETECTION LIMIT) —
  - DOES NOT EXCEED BACKGROUND \*
- NOTE: THE UBL FOR BENZENE AND VOCs IS THE DETECTION LIMIT



NO.	DATE	REVISIONS	BY

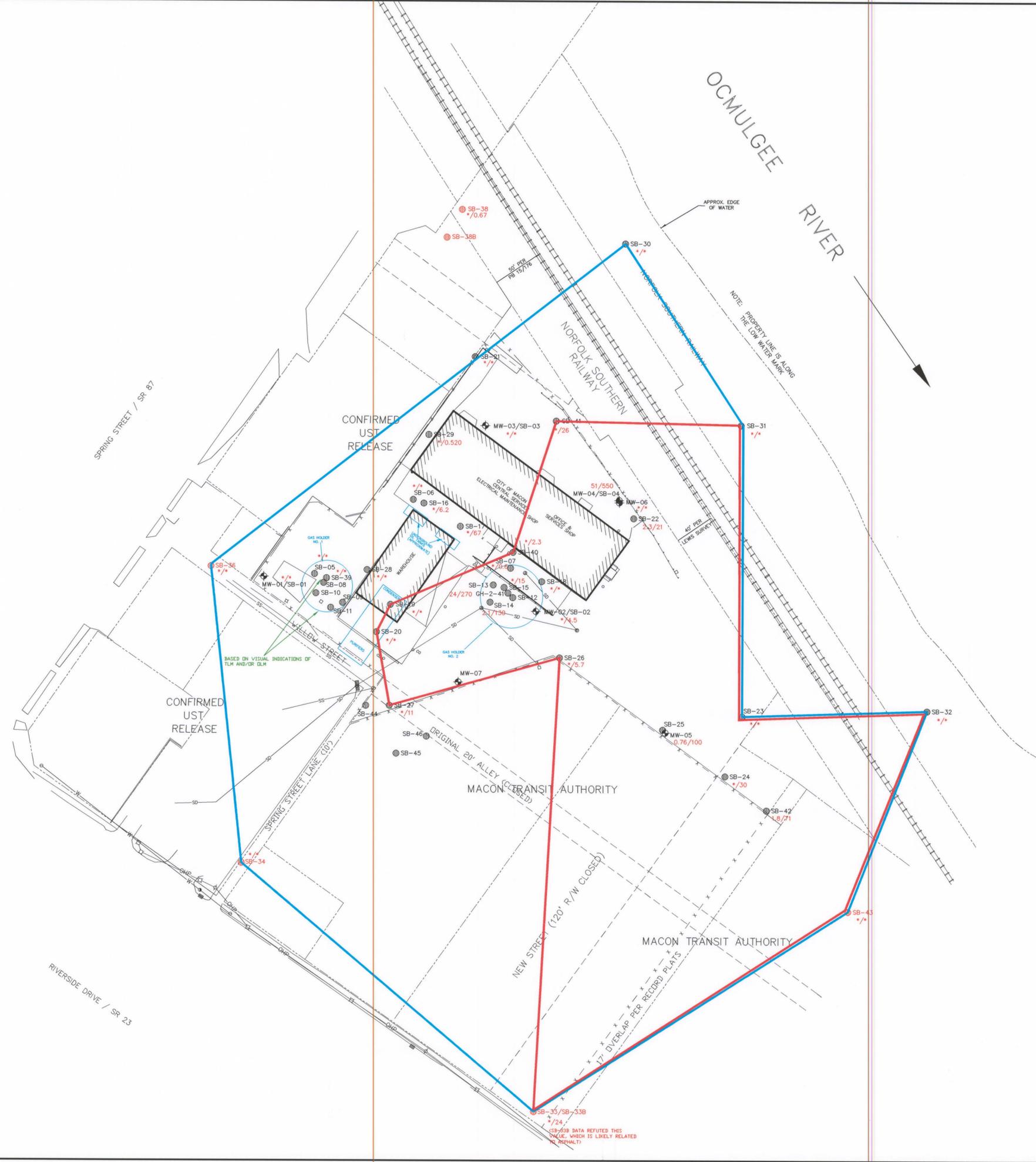
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TOTAL DETECTED BENZENE AND VOCs IN SOIL

FORMER MACON 2 MGP FACILITY  
 MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	09/05/2003
FILENAME	FIGURE-12.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	12



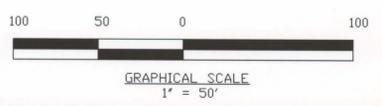
### LEGEND

- PROPERTY LINE ---
- OVERHEAD POWER --- OHP ---
- EXISTING WATER LINE --- W ---
- STORM SEWER --- SD ---
- SANITARY SEWER --- SS ---
- CHAIN LINK FENCE - x - x - x - x -
- MONITORING WELL LOCATION ⊕ MW-6
- SOIL BORING LOCATION ⊙ SB-22
- BACKGROUND SOIL BORING LOCATION (DEFINES MAXIMUM EXTENT) ⊙ SB-33
- FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT) ○
- HIGHEST CONCENTRATION OF NAPHTHALENE IN SOIL EXCEEDING DETECTION LIMIT (mg/kg) 2.1/130
- HIGHEST CONCENTRATION OF TOTAL SVOCs IN SOIL EXCEEDING UPPER BACKGROUND LIMIT (UBL; mg/kg) 2.1/130
- UBL ISOCONCENTRATION LINE OF NAPHTHALENE IN SOIL DRAWN TO POINTS WHERE NAPHTHALENE IS KNOWN TO BE BELOW BACKGROUND (DETECTION LIMIT) —
- UBL ISOCONCENTRATION LINE OF SVOCs IN SOIL DRAWN TO POINTS WHERE SVOCs ARE KNOWN TO BE BELOW BACKGROUND —
- DOES NOT EXCEED BACKGROUND \*

NOTE: THE UBL FOR NAPHTHALENE IS THE DETECTION LIMIT

#### UPPER BACKGROUND LIMITS

COMPOUND	UBL (mg/kg)	
	FILL MATERIAL	NATURAL SOILS
BENZO(A)ANTHRACENE	0.56	DL
BENZO(A)PYRENE	0.69	DL
BENZO(B)FLUORANTHENE	0.61	DL
BENZO(G,H)PERYLENE	0.69	DL
BENZO(K)FLUORANTHENE	0.57	DL
CHRYSENE	0.68	DL
FLUORANTHENE	1.2	DL
INDENO(1,2,3-CD)PYRENE	0.56	DL
PHENANTHRENE	0.56	DL
PYRENE	0.92	DL
OTHER SVOCs	DL	DL



LTR.	DATE	REVISIONS	BY

Prepared By:

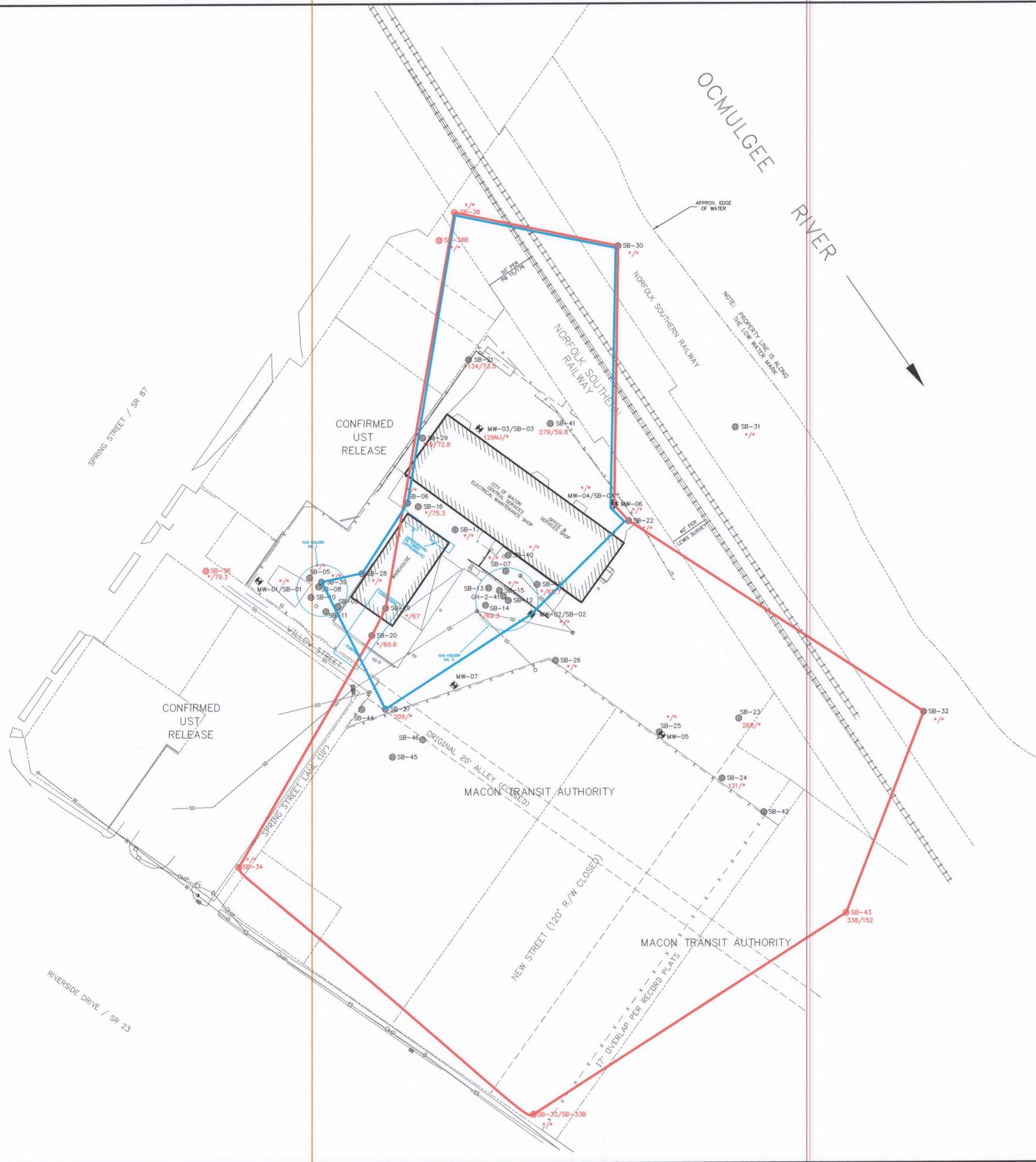
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TOTAL DETECTED NAPHTHALENE AND SVOCs IN SOIL

FORMER MACON 2 MGP FACILITY  
 MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	09/05/2003
FILENAME	FIGURE-13.DWG
PROJ. NUMBER	1100-2990
SHEET NO.	13



### LEGEND

- PROPERTY LINE -----
- OVERHEAD POWER ----- OHP -----
- EXISTING WATER LINE ----- W -----
- STORM SEWER ----- SD -----
- SANITARY SEWER ----- SS -----
- CHAIN LINK FENCE ----- x - x - x - x - x -----
- MONITORING WELL LOCATION  MW-6
- SOIL BORING LOCATION  SB-22
- BACKGROUND SOIL BORING LOCATION (DEFINES MAXIMUM EXTENT)  SB-33
- FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT)
- HIGHEST CONCENTRATION OF BARIUM IN SOIL EXCEEDING UPPER BACKGROUND LIMIT (UBL; mg/kg)  279 / \*
- HIGHEST CONCENTRATION OF VANADIUM IN SOIL EXCEEDING UBL (mg/kg)
- UBL ISOCONCENTRATION LINE OF BARIUM IN SOILS DRAWN TO POINTS WHERE BARIUM IS KNOWN TO BE BELOW BACKGROUND
- UBL ISOCONCENTRATION LINE OF VANADIUM IN SOIL DRAWN TO POINTS WHERE VANADIUM ARE KNOWN TO BE BELOW BACKGROUND
- DOES NOT EXCEED UBL \*
- SPIKE SAMPLE RECOVERY NOT WITHIN RECOVERY LIMITS N
- INDICATES AN ESTIMATED VALUE J

#### UPPER BACKGROUND LIMITS

COMPOUND	UBL (mg/kg)	
	FILL MATERIAL	NATURAL SOILS
BARIUM	115	275
VANADIUM	58.9	120

L.T.R.	DATE	REVISIONS	BY

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BARIUM AND VANADIUM IN SOILS  
 FORMER MACON 2 MGP FACILITY  
 MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	09/05/2003
FILENAME	FIGURE-14.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	14

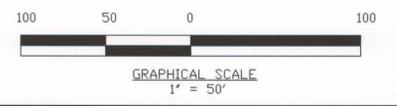


### LEGEND

- PROPERTY LINE -----
- OVERHEAD POWER ----- OHP -----
- EXISTING WATER LINE ----- W -----
- STORM SEWER ----- SD -----
- SANITARY SEWER ----- SS -----
- CHAIN LINK FENCE ----- x - x - x - x - x -----
- MONITORING WELL LOCATION MW-6
- SOIL BORING LOCATION SB-22
- BACKGROUND SOIL BORING LOCATION (DEFINES MAXIMUM EXTENT) SB-33
- FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT)
- HIGHEST CONCENTRATION OF LEAD IN SOIL EXCEEDING UPPER BACKGROUND LIMIT (UBL; mg/kg) 634/4.59
- HIGHEST CONCENTRATION OF MERCURY IN SOIL EXCEEDING UBL (mg/kg)
- UBL ISOCONCENTRATION LINE OF LEAD IN SOILS DRAWN TO POINTS WHERE LEAD IS KNOWN TO BE BELOW BACKGROUND
- UBL ISOCONCENTRATION LINE OF MERCURY IN SOILS DRAWN TO POINTS WHERE MERCURY IS KNOWN TO BE BELOW BACKGROUND
- DOES NOT EXCEED UBL \*
- SPIKE SAMPLE RECOVERY NOT WITHIN RECOVERY LIMITS N
- INDICATES AN ESTIMATED VALUE J
- NOT ANALYZED NA

#### UPPER BACKGROUND LIMITS

COMPOUND	UBL (mg/kg)	
	FILL MATERIAL	NATURAL SOILS
LEAD	204	26.5
MERCURY	0.541	DL
DL - DETECTION LIMIT		



LTR.	DATE	REVISIONS	BY

Prepared By:

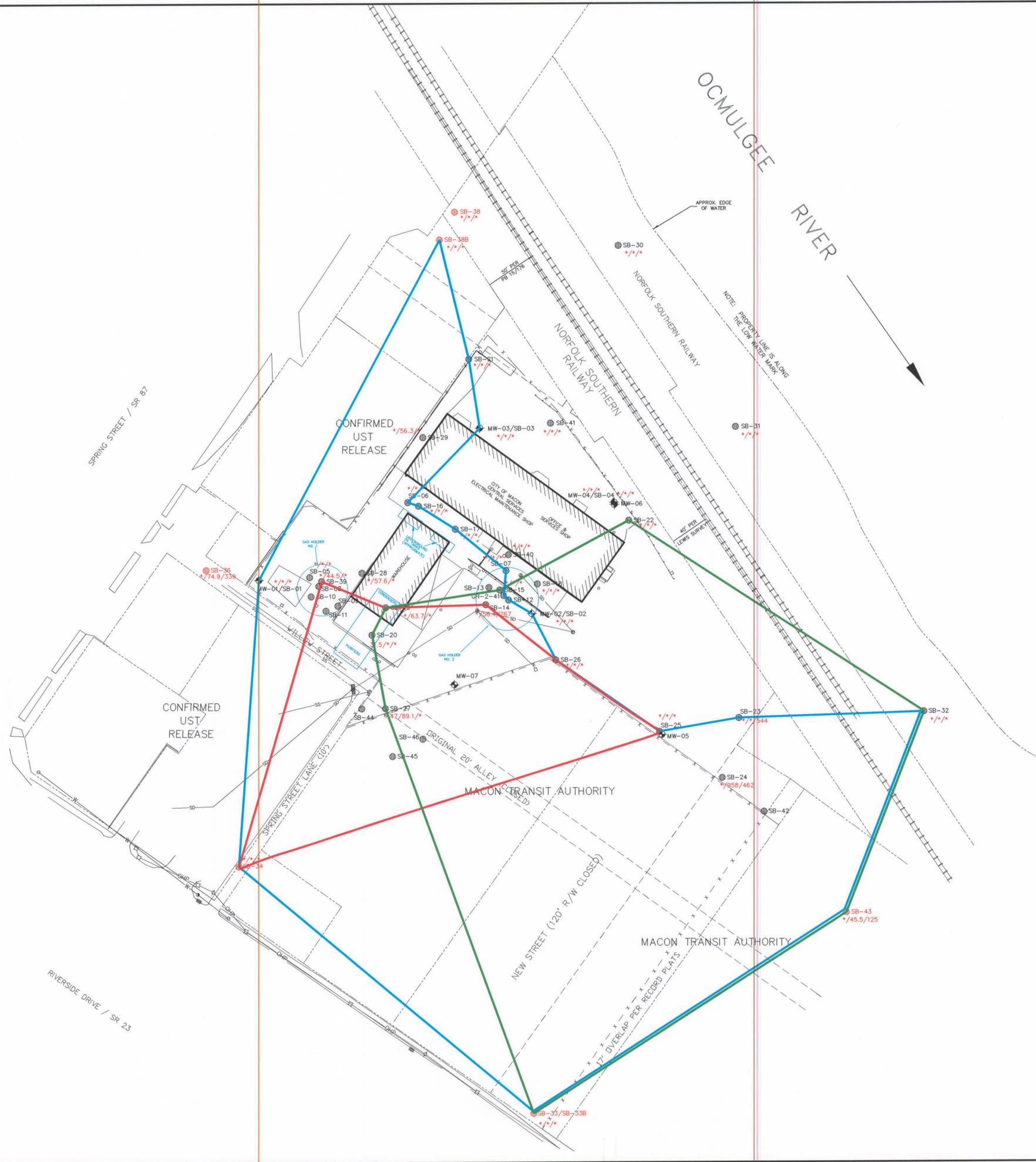
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LEAD AND MERCURY IN SOILS

FORMER MACON 2 MGP FACILITY  
 MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	09/05/2003
FILENAME	FIGURE-15.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	15

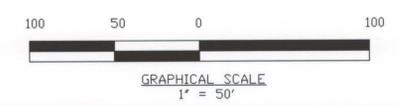


### LEGEND

- PROPERTY LINE ---
- OVERHEAD POWER --- OHP ---
- EXISTING WATER LINE ---
- STORM SEWER ---
- SANITARY SEWER ---
- CHAIN LINK FENCE - x - x - x - x -
- MONITORING WELL LOCATION MW-6
- SOIL BORING LOCATION SB-22
- BACKGROUND SOIL BORING LOCATION (DEFINES MAXIMUM EXTENT) SB-33
- FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT) ○
- HIGHEST CONCENTRATION OF COPPER IN SOIL EXCEEDING UPPER BACKGROUND LIMIT (UBL; mg/kg) 7.47/56.4/267
- HIGHEST CONCENTRATION OF ARSENIC IN SOIL EXCEEDING UBL (mg/kg) ↑
- HIGHEST CONCENTRATION OF ZINC IN SOIL EXCEEDING UBL (mg/kg) ↑
- UBL ISOCONCENTRATION LINE OF ARSENIC IN SOILS DRAWN TO POINTS WHERE ARSENIC IS KNOWN TO BE BELOW BACKGROUND —
- UBL ISOCONCENTRATION LINE OF COPPER IN SOILS DRAWN TO POINTS WHERE COPPER IS KNOWN TO BE BELOW BACKGROUND —
- UBL ISOCONCENTRATION LINE OF ZINC IN SOILS DRAWN TO POINTS WHERE ZINC IS KNOWN TO BE BELOW BACKGROUND —
- DOES NOT EXCEED UBL •

#### UPPER BACKGROUND LIMITS

COMPOUND	UBL (mg/kg)	
	FILL MATERIAL	NATURAL SOILS
ARSENIC	7.05	DL
COPPER	43.4	35.7
ZINC	257	80.3
DL - DETECTION LIMIT		



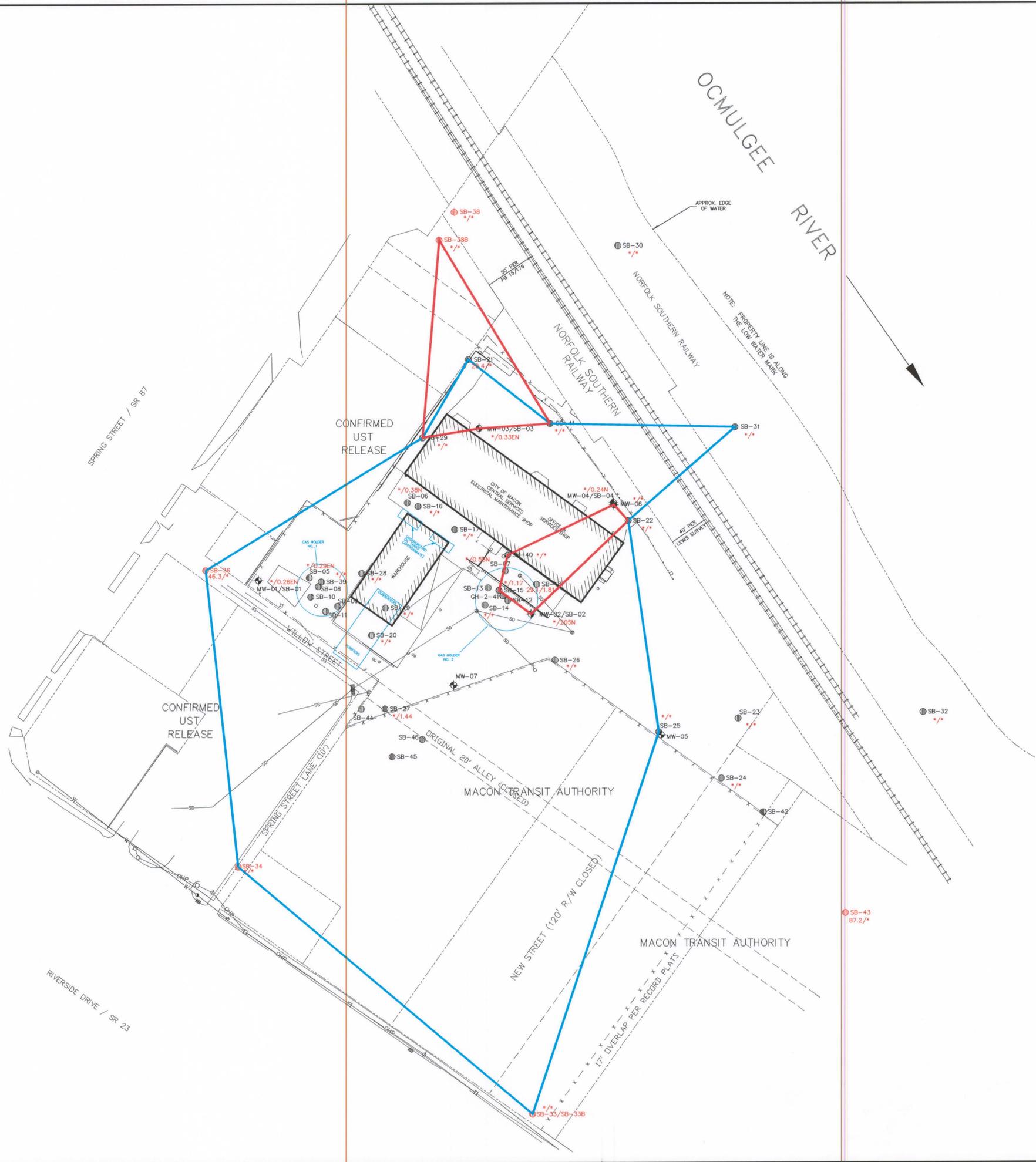
NO.	DATE	REVISIONS	BY

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ARSENIC, COPPER, AND ZINC IN SOILS  
 FORMER MACON 2 MGP FACILITY  
 MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	09/05/2003
FILENAME	FIGURE-16.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	16



### LEGEND

- PROPERTY LINE ---
- OVERHEAD POWER --- OHP ---
- EXISTING WATER LINE --- W ---
- STORM SEWER --- SD ---
- SANITARY SEWER --- SS ---
- CHAIN LINK FENCE - x - x - x - x -
- MONITORING WELL LOCATION ⊕ MW-6
- SOIL BORING LOCATION ⊕ SB-22
- BACKGROUND SOIL BORING LOCATION (DEFINES MAXIMUM EXTENT) ⊕ SB-33
- FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT) ○
- HIGHEST CONCENTRATION OF CHROMIUM IN SOIL EXCEEDING UPPER BACKGROUND LIMIT (UBL; mg/kg) 29.1 / 1.81
- HIGHEST CONCENTRATION OF CYANIDE IN SOIL EXCEEDING UBL (mg/kg) 29.1 / 1.81
- UBL ISOCONCENTRATION LINE OF CHROMIUM IN SOILS DRAWN TO POINTS WHERE CHROMIUM IS KNOWN TO BE BELOW BACKGROUND —
- UBL ISOCONCENTRATION LINE OF CYANIDE IN SOILS DRAWN TO POINTS WHERE CYANIDE IS KNOWN TO BE BELOW BACKGROUND —
- DOES NOT EXCEED UBL +
- VALUES ESTIMATED BECAUSE OF PRESENCE OF INTERFERENCE E
- SPIKE SAMPLE RECOVERY NOT WITHIN RECOVERY LIMITS N

#### UPPER BACKGROUND LIMITS

COMPOUND	UBL (mg/kg)	
	FILL MATERIAL	NATURAL SOILS
CHROMIUM	28.7	52.8
TOTAL CYANIDE	DL	DL
DL - DETECTION LIMIT		

L.T.R.	DATE	REVISIONS	BY

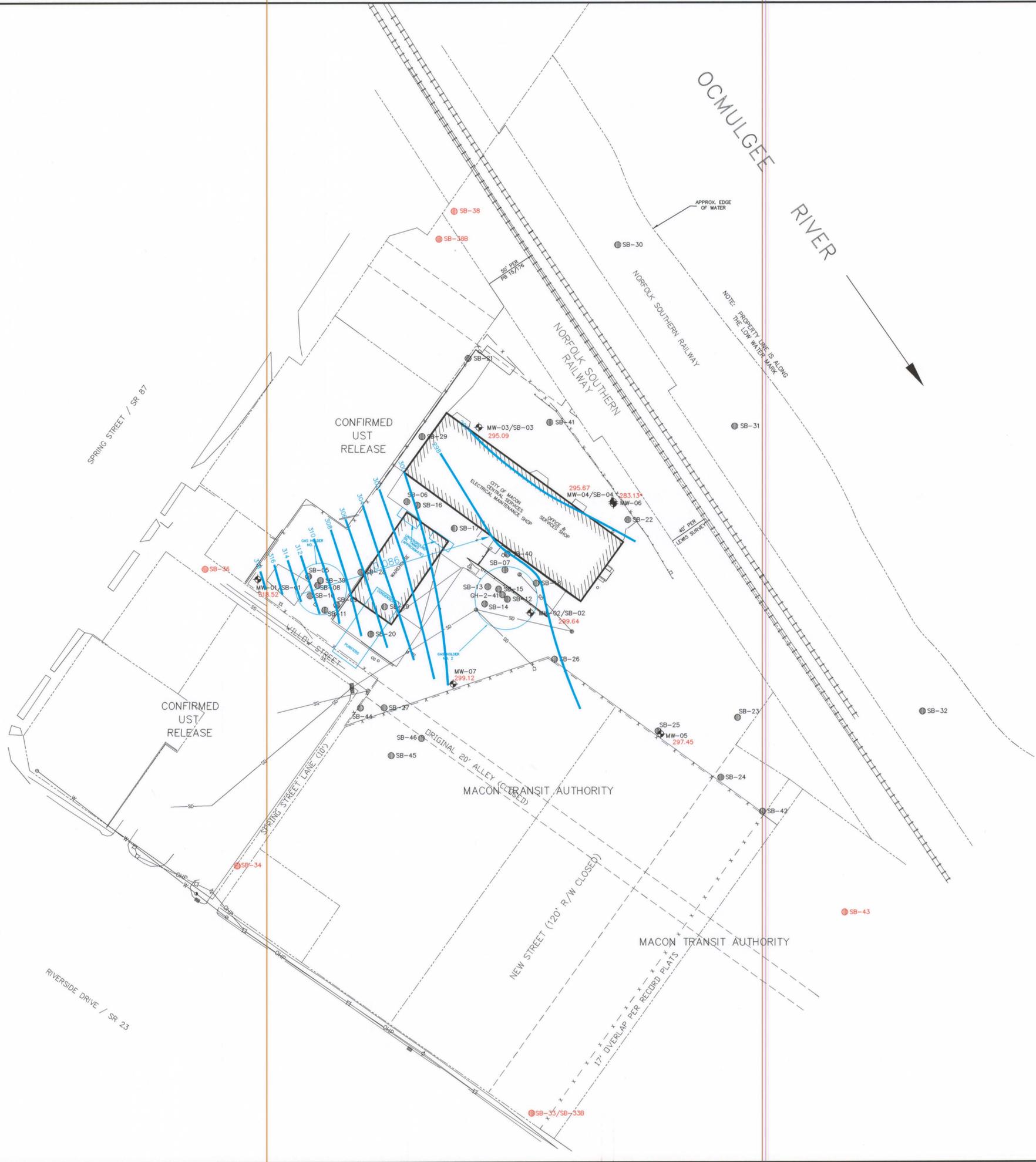
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CHROMIUM AND CYANIDE IN SOILS

FORMER MACON 2 MGP FACILITY  
MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	09/05/2003
FILENAME	FIGURE-17.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	17



### LEGEND

- PROPERTY LINE ---
- OVERHEAD POWER OHP
- EXISTING WATER LINE W
- STORM SEWER SD
- SANITARY SEWER SS
- CHAIN LINK FENCE - x - x - x - x -
- MONITORING WELL LOCATION MW-6
- SOIL BORING LOCATION SB-22
- BACKGROUND SOIL BORING LOCATION (DEFINES MAXIMUM EXTENT) SB-33
- FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT) ○
- CONTOUR OF GROUNDWATER IN FEET ABOVE MEAN SEA LEVEL —
- GROUNDWATER FLOW DIRECTION →
- WATER TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL) 286.10
- MW-6 SCREENED IN LOWER PORTION OF AQUIFER; NOT USED IN CONTOURING \*

LTR.	DATE	REVISIONS	BY

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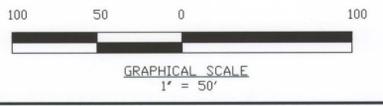


WATER TABLE ELEVATION MAP FOR  
AUGUST 20, 2003

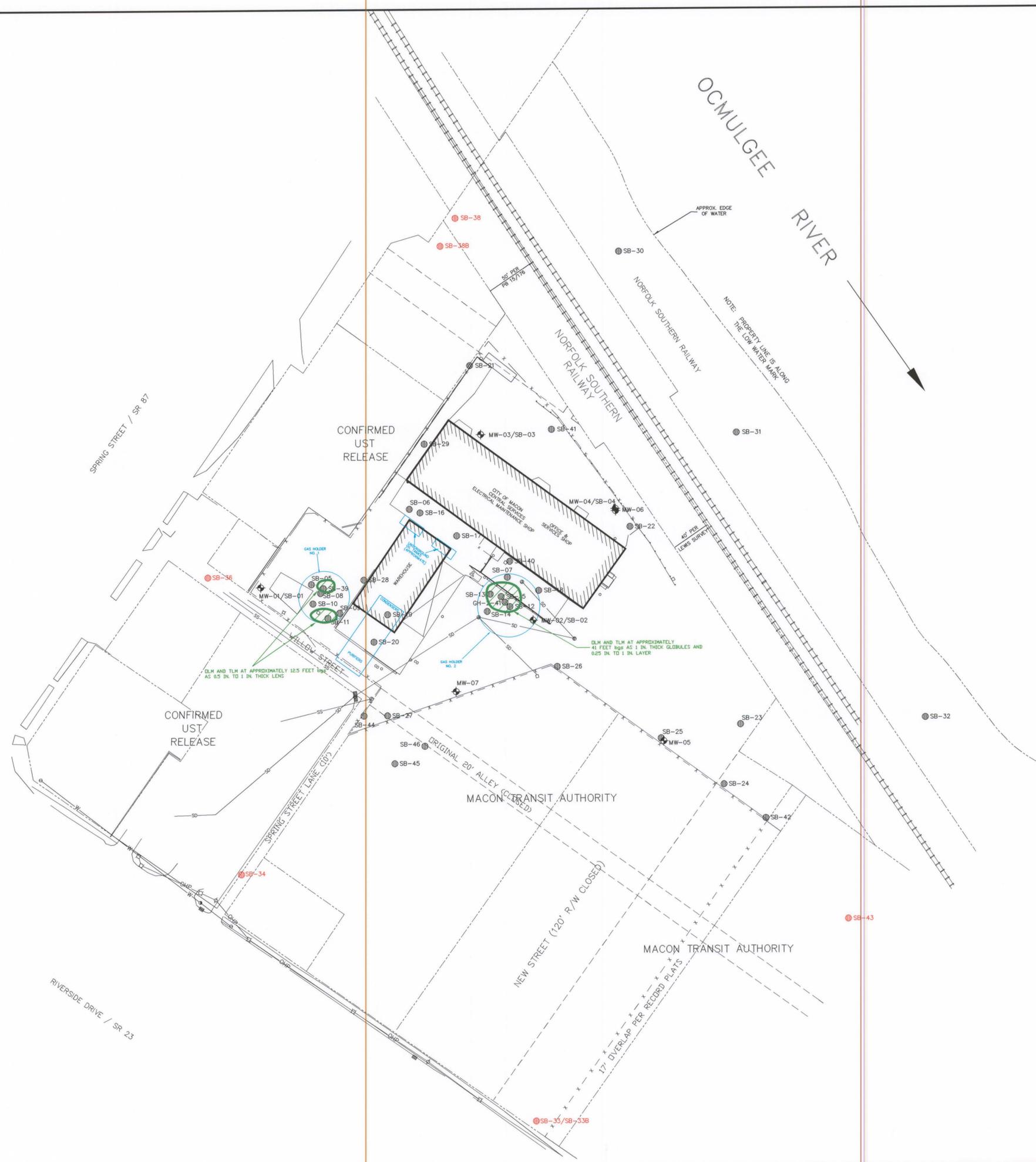
FORMER MACON 2 MGP FACILITY  
MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	09/05/2003
FILENAME	FIGURE-18.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	18







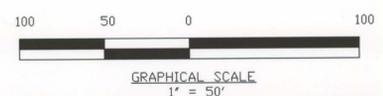
### LEGEND

- PROPERTY LINE ---
- OVERHEAD POWER — OHP —
- EXISTING WATER LINE — W —
- STORM SEWER — SD —
- SANITARY SEWER — SS —
- CHAIN LINK FENCE - x - x - x - x -
- MONITORING WELL LOCATION ⊕ MW-6
- SOIL BORING LOCATION ⊕ SB-22
- BACKGROUND SOIL BORING LOCATION (DEFINES MAXIMUM EXTENT) ⊕ SB-33
- FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT) ○
- VISUAL INDICATION OF TAR-LIKE MATERIAL (TLM) AND/OR OIL-LIKE MATERIAL (OLM) IN SOIL ⊗

NOTE: LAYER - A TLM OR OLM UNIT THAT DOES NOT EXTEND (PINCHES-OUT) THROUGH SAMPLE WITHIN SAMPLE

LENS - A TLM OR OLM LAYER THAT DOES NOT EXTEND (PINCHES-OUT) LATERALLY WITHIN SAMPLE

GLOBULE - A SMALL SPHERICAL ACCUMULATION OF TLM OR OLM WITHIN SAMPLE



L.T.R.	DATE	REVISIONS	BY

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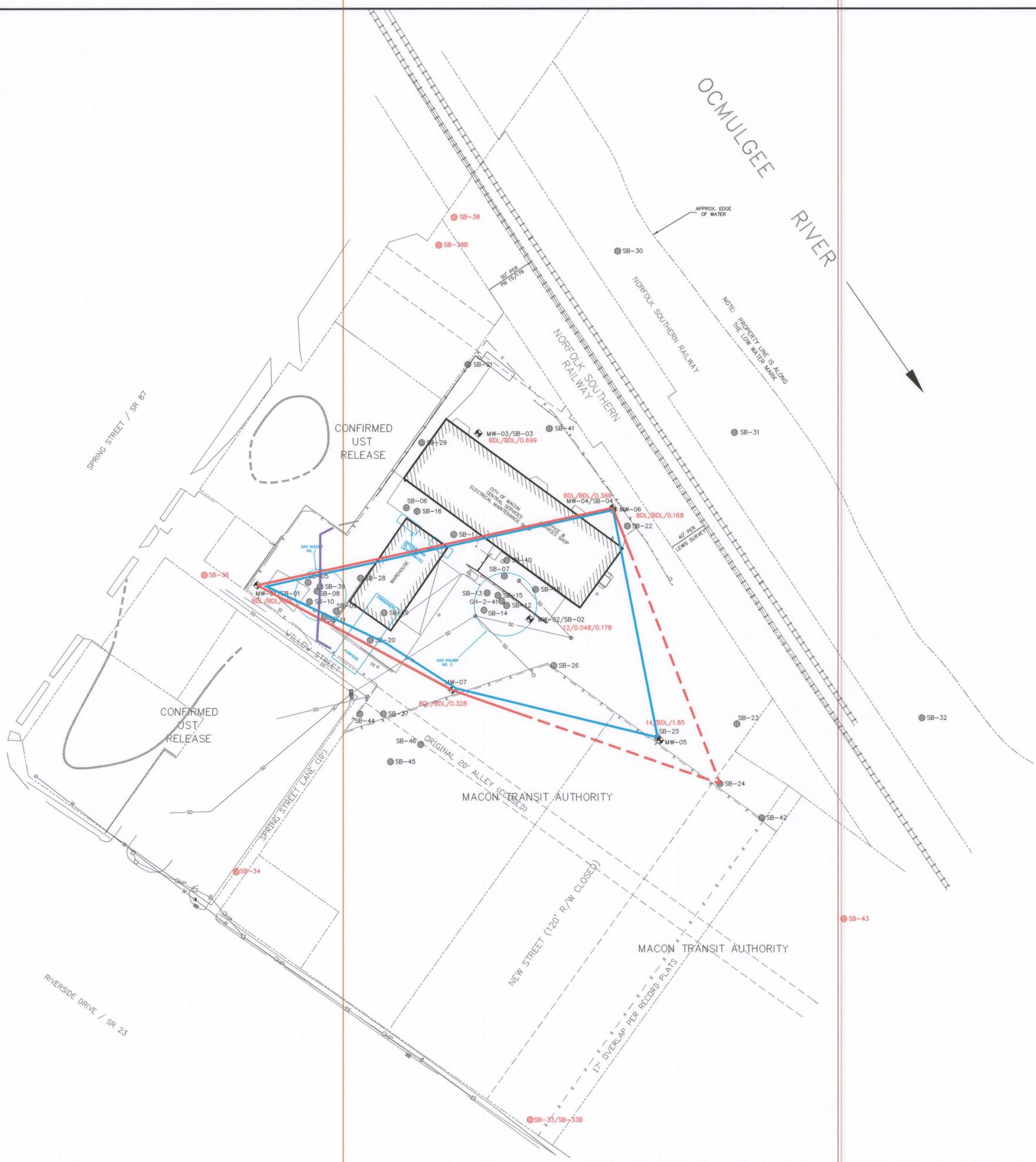


VISUAL INDICATION OF TLM AND OLM IN SOILS

FORMER MACON 2 MGP FACILITY  
 MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	09/05/2003
FILENAME	FIGURE-11.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	11



### LEGEND

- PROPERTY LINE ---
- OVERHEAD POWER --- OHP ---
- EXISTING WATER LINE ---
- STORM SEWER ---
- SANITARY SEWER ---
- CHAIN LINK FENCE - x - x - x - x -
- MONITORING WELL LOCATION ⊕ MW-6
- SOIL BORING LOCATION ⊕ SB-22
- BACKGROUND SOIL BORING LOCATION (DEFINES MAXIMUM EXTENT) ⊕ SB-33
- FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT) ○
- CONCENTRATION OF ACENAPHTHENE IN GROUNDWATER (ug/L) 12/0.48/0.178
- CONCENTRATION OF CYANIDE IN GROUNDWATER (mg/L) 12/0.48/0.178
- CONCENTRATION OF BARIUM IN GROUNDWATER (Mg/L) 12/0.48/0.178
- APPROXIMATE BENZENE GROUNDWATER PLUMES ON ADJACENT PROPERTIES (FROM UST REPORTS) ---
- UBL ISOCONCENTRATION LINE OF ACENAPHTHENE IN GROUNDWATER WHERE ACENAPHTHENE IS KNOWN TO BE BELOW DETECTION LIMIT (DASHED LINES ARE INFERRED) ---
- UBL ISOCONCENTRATION LINE OF CYANIDE IN GROUNDWATER WHERE CYANIDE IS KNOWN TO BE BELOW DETECTION LIMIT ---
- UBL ISOCONCENTRATION LINE OF BARIUM IN GROUNDWATER WHERE BARIUM IS KNOWN TO BE BELOW DETECTION LIMIT (PLEASE SEE SECTION 5.6.3 OF TEXT DESCRIBING BARIUM IN GROUNDWATER) ---
- BELOW DETECTION LIMIT BDL

LTR.	DATE	REVISIONS	BY

Prepared By:

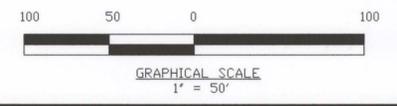
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TOTAL DETECTED ACENAPHTHENE, CYANIDE AND BARIUM GROUNDWATER AUGUST 2003

FORMER MACON 2 MGP FACILITY  
 MACON, GEORGIA

ENGINEERS' SEAL

DESIGNED	-
DRAWN	TCM
CHECKED	-
DATE	09/05/2003
FILENAME	FIGURE-19.DWG
PROJ. NUMBER	1100-2990
FIGURE NO.	19





**B-2      COMPLIANCE STATUS  
INVESTIGATION**

**VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

		Saturated/Unsaturated	Unit	Benzene	Carbon Disulfide	Ethylbenzene	Methylene Chloride	Toluene	Xylenes	Total Detected VOCs
UBL - Fill Material				DL	DL	DL	DL	DL	DL	--
UBL - Nat. Soils				DL	DL	DL	DL	DL	DL	--
SB-14-0.5-2	U	Fill		5.8U	5.8U	5.8U	23U	5.8U	5.8U	0
SB-14-16-20	U	Fill		5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
SB-14-24-28	S	Fill		9.3	8.2U	8.2U	33U	8.2U	8.2U	9.3
SB-15-4-8	U	Fill		4.2U	4.2U	4.2U	17U	4.2U	4.2U	0
SB-15-36-41	S	Fill		5.1U	17	5.1U	20U	5.1U	5.1U	17
SB-16-0.5-2	U	Fill		6U	6U	6U	24U	6U	6U	0
SB-16-2-4	U	Fill		4.9U	4.9U	4.9U	20U	4.9U	4.9U	0
SB-16-19-24	U	Fill		4.9U	4.9U	4.9U	20U	4.9U	4.9U	0
SB-16-24-29	S	Fill		6.6U	14	6.6U	26U	6.6U	6.6U	14
SB-16-29-34	S	Nat. Soil		7U	7U	7U	28U	7U	7U	0
SB-16-34-37	S	Nat. Soil		5.6U	5.6U	5.6U	22U	5.6U	5.6U	0
SB-17-0.5-2	U	Fill		6.1U	6.1U	6.1U	24U	6.1U	6.1U	0
SB-17-2-4	U	Fill		4.4U	4.4U	4.4U	18U	4.4U	4.4U	0
SB-17-16-20	U	Fill		5U	5.3	5U	20U	5U	5U	5.3
SB-17-24-28	S	Fill		5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
SB-17-29-33	S	Fill		13	6.3U	6.3U	25U	6.3U	6.3U	13
SB-17-44-49	S	Nat. Soil		5100	6.9U	23	28U	150	61	5300
SB-17-49-51	S	Nat. Soil		10	5U	5U	20U	5U	5U	10
SB-17-54-59	S	Nat. Soil		15	4.9U	4.9U	20U	4.9U	4.9U	15
SB-18-0.5-2	U	Fill		5.6U	5.6U	5.6U	22U	5.6U	5.6U	0
SB-18-2-4	U	Fill		5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
SB-18-16-18	U	Fill		5.2U	5.2U	5.2U	21U	5.2U	5.2U	0
SB-18-28-32	S	Fill		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-18-32-36	S	Nat. Soil		94	5.7U	15	23U	9.6	37	160
SB-18-56-60	S	Nat. Soil		6.5U	6.5U	6.5U	26U	6.5U	6.5U	0
SB-19-0.5-2	U	Fill		4.4U	4.4U	4.4U	18U	4.4U	4.4U	0
SB-19-2-4	U	Fill		5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
DUP032101A	U	Fill		4.8U	4.8U	4.8U	19U	4.8U	4.8U	0
SB-19-4-8	U	Fill		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-19-8-11	U	Nat. Soil		5.2U	5.2U	5.2U	21U	5.2U	5.2U	0
SB-20-0-2	U	Fill		5.8U	5.8U	5.8U	23U	5.8U	5.8U	0
DUP031501B	U	Fill		5.3U	5.3U	5.3U	21U	5.3U	5.3U	0
SB-20-2-4	U	Fill		4.3U	4.3U	4.3U	17U	4.3U	4.3U	0
SB-20-4-8	U	Fill		4.8U	4.8U	4.8U	19U	4.8U	4.8U	0
SB-20-9-13	U	Nat. Soil		5.5U	5.5U	5.5U	22U	5.5U	5.5U	0
SB-21-0-2	U	Fill		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
DUP030601A	U	Fill		4.8U	4.8U	4.8U	19U	4.8U	4.8U	0
SB-21-2-4	U	Fill		7.1U	7.1U	7.1U	29U	7.1U	7.1U	0
SB-21-12-16	U	Fill		4.9U	4.9U	4.9U	20U	6.7	4.9U	6.7
SB-21-16-20	U	Fill		5.4U	5.4U	5.4U	22U	5.4U	5.4U	0
SB-21-28-30	S	Fill		5.3U	10	5.3U	21U	5.3U	5.3U	10
SB-21-44-48	S	Nat. Soil		5U	5U	5U	20U	5U	5U	0
SB-21-60-64	S	Nat. Soil		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-22-0-2	U	Fill		4.8U	4.8U	4.8U	19U	4.8U	4.8U	0

**VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

		Saturated/Unsaturated	Unit	Benzene	Carbon Disulfide	Ethylbenzene	Methylene Chloride	Toluene	Xylenes	Total Detected VOCs
UBL - Fill Material				DL	DL	DL	DL	DL	DL	--
UBL - Nat. Soils				DL	DL	DL	DL	DL	DL	--
SB-22-2-4	U	Fill		3.6U	3.6U	3.6U	15U	3.6U	3.6U	0
SB-22-19-24	U	Fill		3.8U	3.8U	3.8U	15U	3.8U	3.8U	0
SB-22-24-29	S	Nat. Soil		4.5U	4.5U	4.5U	18U	4.5U	4.5U	0
SB-22-59-62	S	Nat. Soil		5.1U	5.1U	5.1U	21U	5.1U	5.1U	0
SB-23-0-2	U	Fill		5.6U	5.6U	5.6U	22U	5.6U	5.6U	0
DUP032201B	U	Fill		5.5U	5.5U	5.5U	22U	5.5U	5.5U	0
SB-23-2-4	U	Fill		3.8U	3.8U	3.8U	15U	3.8U	3.8U	0
SB-23-14-19	U	Fill		5.2U	5.2U	5.2U	21U	5.2U	5.2U	0
SB-23-24-29	S	Fill		5.9U	5.9U	5.9U	23U	5.9U	5.9U	0
SB-23-59-62	S	Nat. Soil		6.2U	6.2U	6.2U	25U	6.2U	6.2U	0
SB-24-0-2	U	Fill		4.1U	4.1U	4.1U	16U	4.1U	4.1U	0
SB-24-2-4	U	Fill		3.5U	3.5U	3.5U	14U	3.5U	3.5U	0
SB-24-8-12	U	Fill		4.8U	5.4	4.8U	19U	4.8U	4.8U	5.4
SB-24-32-34	S	Fill		5.4U	5.4	5.4U	22U	5.4U	5.4U	18
SB-24-40-42	S	Nat. Soil		5.6U	5.6U	5.6U	22U	5.6U	5.6U	0
SB-24-44-48	S	Nat. Soil		5.3U	5.3U	5.3U	21U	5.3U	5.3U	0
DUP030101A	S	Nat. Soil		4.5U	4.5U	4.5U	18U	4.5U	4.5U	0
SB-24-52-56	S	Nat. Soil		4.9U	4.9U	4.9U	19U	4.9U	4.9U	0
SB-25-0.5-2	U	Fill		4.4U	4.4U	4.4U	18U	4.4U	4.4U	0
SB-25-2-4	U	Fill		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-25-16-20	U	Fill		3.7U	3.7U	3.7U	15U	3.7U	3.7U	0
SB-25-28-32	S	Fill		5U	5U	5U	20U	5U	5U	0
SB-25-44-48	S	Nat. Soil		5.1U	5.1U	5.1U	21U	5.1U	5.1U	0
SB-25-56-60	S	Nat. Soil		4.4U	4.4U	4.4U	17U	4.4U	4.4U	0
SB-25-60-61	S	Nat. Soil		6U	6U	6U	24U	6U	6U	0
SB-26-0.5-2	U	Fill		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-26-2-4	U	Fill		4.1U	4.1U	4.1U	16U	4.1U	4.1U	0
SB-26-8-12	U	Fill		5U	5U	5U	20U	5U	5U	0
DUP030201A	U	Fill		3.9U	3.9U	3.9U	16U	3.9U	3.9U	0
SB-26-20-24	U	Fill		3.5U	3.5U	3.5U	14U	3.5U	3.5U	0
SB-26-32-36	S	Fill		5.2U	5.2U	5.2U	21U	5.2U	5.2U	0
SB-26-48-51	S	Nat. Soil		6.8U	6.8U	6.8U	27U	6.8U	6.8U	0
SB-26-51-52	S	Nat. Soil		5.9U	5.9U	5.9U	24U	5.9U	5.9U	0
SB-27-0.5-1.5	U	Fill		5.4U	5.4U	5.4U	21U	5.4U	5.4U	0
SB-27-2-4	U	Fill		4.5U	4.5U	4.5U	18U	4.5U	4.5U	0
SB-27-8-12	U	Fill		5.4U	5.4U	5.4U	22U	6.8	6.5	43
SB-27-16-20	U	Nat. Soil		4.8U	4.8U	4.8U	19U	4.8U	4.8U	0
SB-27-20-21	S	Nat. Soil		4.9U	4.9U	4.9U	19U	4.9U	4.9U	0
SB-28-0.5-2	U	Fill		5.4U	5.4U	5.4U	21U	5.4U	5.4U	0
SB-28-2-4	U	Fill		4.5U	4.5U	4.5U	18U	4.5U	4.5U	0
SB-28-4-8	U	Fill		4.8U	5.7	4.8U	19U	4.8U	4.8U	5.7
SB-28-8-9.5	U	Nat. Soil		5.3U	5.3U	5.3U	21U	5.3U	5.3U	0
SB-29-0.5-2	U	Fill		5U	5U	5U	20U	5U	5U	0
DUP030501A	U	Fill		5U	5U	5U	20U	5U	5U	0

**VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

		Saturated/Unsaturated	Unit	Benzene	Carbon Disulfide	Ethylbenzene	Methylene Chloride	Toluene	Xylenes	Total Detected VOCs
UBL - Fill Material				DL	DL	DL	DL	DL	DL	--
UBL - Nat. Soils				DL	DL	DL	DL	DL	DL	--
SB-29-2-4	U	Fill		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-29-20-24	U	Fill		3.5U	3.5U	3.5U	14U	3.5U	3.5U	0
SB-29-28-32	S	Fill		4.8U	4.8U	4.8U	19U	4.8U	4.8U	0
SB-29-48-52	S	Nat. Soil		7U	7U	7U	28U	7U	7U	0
SB-29-52-53	S	Nat. Soil		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-30-0-2	U	Nat. Soil		5.8U	5.8U	5.8U	23U	5.8U	5.8U	0
DUP041201A	U	Nat. Soil		6.1U	6.1U	6.1U	24U	6.1U	6.1U	0
SB-30-2-4	U	Nat. Soil		6.9U	6.9U	6.9U	28U	6.9U	6.9U	0
SB-30-8-12	S	Nat. Soil		6.8U	6.8U	6.8U	27U	6.8U	6.8U	0
SB-30-16-20	S	Nat. Soil		5.5U	5.5U	5.5U	22U	5.5U	5.5U	0
SB-31-0-2	U	Nat. Soil		6.9U	6.9U	6.9U	28U	6.9U	6.9U	0
SB-31-2-4	U	Nat. Soil		7U	7U	7U	28U	7U	7U	0
SB-31-4-8	U	Nat. Soil		6.3U	6.3U	6.3U	25U	6.3U	6.3U	0
SB-31-8-12	U	Nat. Soil		6.7U	6.7U	6.7U	27U	6.7U	6.7U	0
SB-31-16-20	S	Nat. Soil		6.4U	6.4U	6.4U	26U	6.4U	6.4U	0
SB-32-0-2	U	Nat. Soil		7.3U	7.3U	7.3U	29U	7.3U	7.3U	0
SB-32-2-4	U	Nat. Soil		5.8U	5.8U	5.8U	23U	5.8U	5.8U	0
SB-32-4-8	U	Nat. Soil		6.4U	6.4U	6.4U	26U	6.4U	6.4U	0
SB-32-16-20	S	Nat. Soil		6U	6U	6U	24U	6U	6U	0
SB-33-0.5-2	U	Fill		4.2U	4.2U	4.2U	17U	4.2U	4.2U	0
SB-33-2-4	U	Fill		4.6U	4.6U	4.6U	19U	4.6U	4.6U	0
SB-33-8-10	U	Fill		5.3U	5.3U	5.3U	21U	5.3U	5.3U	0
SB-33-10-14	U	Nat. Soil		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-34-0.5-2	U	Fill		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-34-2-4	U	Fill		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-34-4-8	U	Fill		5.7	4.1U	4.1U	17U	4.1U	4.1U	5.7
SB-34-8-10	U	Nat. Soil		7.3U	7.3U	7.3U	29U	7.3U	7.3U	0
SB-36-0.5-2	U	Fill		5.4U	5.4U	5.4U	21U	5.4U	5.4U	0
SB-36-2-4	U	Fill		6.6U	6.6U	6.6U	26U	6.6U	6.6U	0
SB-36-4-6	U	Nat. Soil		8.5U	8.5U	8.5U	34U	8.5U	8.5U	0
SB-38-0-2	U	Fill		5.7U	5.7U	5.7U	23U	5.7U	5.7U	0
DUP041201B	U	Fill		5.6U	5.6U	5.6U	23U	5.6U	5.6U	0
SB-38-2-4	U	Fill		5.5U	5.5U	5.5U	22U	5.5U	5.5U	0
SB-38-4-6.5	U	Fill		6.1U	6.1U	6.1U	24U	6.1U	6.1U	0
SB-38-14-19	S	Nat. Soil		6.6U	6.6U	6.6U	26U	6.6U	6.6U	0
SB-38-34-38	S	Nat. Soil		62	6.8U	6.8U	27U	6.8U	6.8U	62
SB-39-0.5-2	U	Fill		6.1U	6.1U	6.1U	24U	6.1U	6.1U	0
SB-39-4-8	U	Fill		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-39-8-12.5	U	Fill		4.5U	4.5U	4.5U	18U	4.5U	4.5U	0
SB-40-0.5-2	U	Fill		6U	6U	6U	24U	6U	6U	0
SB-40-2-4	U	Fill		5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
SB-40-16-20	U	Fill		4.7U	4.7U	4.7U	19U	4.7U	4.7U	0
SB-40-24-28	S	Fill		4.6U	4.6U	4.6U	18U	4.6U	4.6U	0
SB-40-40-44	S	Nat. Soil		33	4.5U	4.5U	18U	4.5U	4.5U	33

**VOLATILE ORGANIC COMPOUNDS**  
**SOIL SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER KILOGRAM (ug/kg)**

	Saturated/Unsaturated	Unit	Benzene	Carbon Disulfide	Ethylbenzene	Methylene Chloride	Toluene	Xylenes	Total Detected VOCs
UBL - Fill Material			DL	DL	DL	DL	DL	DL	--
UBL - Nat. Soils			DL	DL	DL	DL	DL	DL	--
DUP032001A	S	Nat. Soil	64	6.1U	6.1U	24U	6.1U	6.1U	64
SB-40-56-58	S	Nat. Soil	4.9U	4.9U	4.9U	20U	4.9U	4.9U	0
SB-41-0-2	U	Fill	7.9U	7.9U	7.9U	32U	7.9U	7.9U	0
SB-41-2-4	U	Fill	5.1U	5.1U	5.1U	20U	5.1U	5.1U	0
SB-41-19-24	U	Fill	4.5U	12	4.5U	18U	4.5U	4.5U	12
SB-41-24-29	S	Fill	8.3U	15	8.3U	33U	8.3U	8.3U	15
SB-41-54-59	S	Nat. Soil	4.9U	4.9U	4.9U	20U	4.9U	4.9U	0
MW-6-34-39	S	Nat. Soil	6.1U	6.1U	6.1U	25U	6.1U	6.1U	0
MW-6-44-49	S	Nat. Soil	6.3U	6.3U	6.3U	25U	6.3U	6.3U	0
DUP032701A	S	Nat. Soil	5.6U	5.6U	5.6U	22U	5.6U	5.6U	0
GH-2-41	S	Fill	7.5U	7.5U	7.5U	30U	7.5U	7.5U	0













**INORGANIC COMPOUNDS**  
**SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/ WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)**

	Saturated/Unsaturated	Unit	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
SB-14-0-5-2	U	Fill	6.33U	100	3.16U	3.16U	9.48	51.6	13.0	0.131	6.33U	69.3	47.0	0.959U
SB-14-16-20	U	Fill	5.54U	104	2.77U	2.77U	11.0	31.7	195	9.43	5.76	17.5	267	1.09U
SB-14-24-28	S	Fill	5.66U	61.8	2.83U	2.83U	9.68	56.4	83.3	0.147	5.66U	18.1	39.1	0.985U
SB-15-4-8	U	Fill	5.09U	53.1	2.54U	2.54U	7.37	17.1	9.72	0.105U	5.09U	47.6	32.5	1.1U
SB-15-36-41	S	Fill	4.6U	25.6	2.3U	2.3U	4.68	4.43	10.0	0.0957U	4.6U	7.70	11.7	1.17
SB-16-0-5-2	U	Fill	6.26U	65.3	3.13U	3.13U	17.2	39.2	10.4	0.124U	6.26U	75.3	18.8	1.13U
SB-16-2-4	U	Fill	4.63U	6.52	2.32U	2.32U	2.77	3.19	7.94	0.288	4.63U	24.6	9.58	0.754U
SB-16-19-24	U	Fill	5.19U	88.1	2.59U	2.59U	14.9	12.3	125	0.202	5.19U	31.5	118	0.735U
SB-16-24-29	S	Fill	5.41U	37.5	2.71U	2.71U	9.28	16.9	62.1	0.299	5.41U	19.9	48.4	0.739U
SB-16-29-34	S	Nat. Soil	5.26U	76.0	2.63U	2.63U	9.88	2.82	16.3	0.131U	5.26U	9.81	14.3	1.08U
SB-16-34-37	S	Nat. Soil	4.36U	9.77	2.18U	2.18U	3.73	2.18U	7.69	0.11U	4.36U	5.88	4.98	1.06U
SB-17-0-5-2	U	Fill	6.02U	114	3.01U	3.01U	9.93	23.3	16.8	0.112	6.28	43.1	48.1	1.2U
SB-17-2-4	U	Fill	5.16U	80.1	2.58U	2.58U	8.10	19.8	14.7	0.115U	5.16U	37.4	31.2	1.25U
SB-17-16-20	U	Fill	5.91U	44.2	2.95U	2.95U	11.4	13.2	54.3	0.170	5.91U	14.0	58.3	0.738U
SB-17-24-28	S	Fill	4.95U	75.4	2.47U	2.47U	10.5	9.51	41.9	0.223	5.05	30.8	40.5	0.833U
SB-17-29-33	S	Fill	5.78	84.4	2.78U	2.78U	10.9	12.2	73.4	0.159	5.57U	21.5	83.5	1.03U
SB-17-44-49	S	Nat. Soil	6.89U	157	3.44U	3.44U	37.1	21.6	16.5	0.128U	13.4	62.1	57.9	1.32U
SB-17-49-51	S	Nat. Soil	5.35U	13.4	2.67U	2.67U	6.44	2.67U	5.35U	0.116U	5.35U	8.64	7.36	0.989U
SB-17-54-59	S	Nat. Soil	5.29U	24.0	2.64U	2.64U	7.35	3.66	5.29U	0.118U	5.29U	5.29U	13.2	0.97U
SB-18-0-5-2	U	Fill	5.44U	68.2	2.72U	2.72U	9.84	20.5	24.6	0.135	5.44U	46.1	39.4	1.17U
SB-18-2-4	U	Fill	3.98U	65.4	1.99U	1.99U	10.9	16.8	77.1	0.191	4.34	39.8	55.9	1.11U
SB-18-16-18	U	Fill	3.61U	59.6	1.81U	1.81U	7.78	12.1	70.6	0.182	3.61U	23.6	62.6	1.11U
SB-18-28-32	S	Fill	5.96U	111	2.98U	2.98U	23.1	18.3	14.0	0.0988U	10.1	69.7	44.0	1.28U
SB-18-32-36	S	Nat. Soil	4.82U	74.6	2.41U	2.41U	14.6	7.79	14.5	0.111U	5.54	28.7	23.6	1.8U
SB-18-56-60	S	Nat. Soil	5.78U	68.8	2.89U	2.89U	22.7	14.2	6.91	0.105U	9.04	40.9	41.9	1.33U
SB-19-0-5-2	U	Fill	4.81U	87.9	2.4U	2.4U	11.2	63.7	13.5	0.105U	6.72	57.0	44.5	1.01U
SB-19-2-4	U	Fill	4.32U	29.9	2.16U	2.16U	8.07	16.4	21.6	0.102	4.32U	25.9	16.9	0.96U

**INORGANIC COMPOUNDS**  
**SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/ WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)**

	Saturated/Unsaturated	Unit	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
DUP032101A	U	Fill	4.79U	29.4	2.4U	2.4U	6.75	14.6	11.2	0.11U	4.79U	24.3	11.2	0.873U
SB-19-4-8	U	Fill	4.62U	47.6	2.31U	2.31U	7.34	11.3	11.1	0.0963U	4.62U	20.8	13.8	1.08U
SB-19-8-11	U	Nat. Soil	4.74U	9.42	2.37U	2.37U	4.84	2.37U	4.74U	0.108U	4.74U	9.66	4.74U	1U
SB-20-0-2	U	Fill	3.15	47.5	2.47U	2.47U	25.0	21.8	117	0.1825	5.85	50.1	97.2	1.27U
DUP031501B	U	Fill	5.3U	88.3	2.65U	2.65U	12.3	36.1	11.3	0.112U	6.74	60.6	39.4	1.22U
SB-20-2-4	U	Fill	4.64U	50.4	2.32U	2.32U	9.05	16.6	28.0	DL	4.64U	34.9	33.6	1.17U
SB-20-4-8	U	Fill	5.24U	65.4	2.62U	2.62U	12.2	14.3	33.3	0.170	5.25	29.9	45.5	1.1U
SB-20-9-13	U	Nat. Soil	4.15U	8.32	2.07U	2.07U	8.22	2.98	8.55	0.103U	4.15U	6.97	6.24	1.13U
SB-21-0-2	U	Fill	5.98U	76.7	2.99U	2.99U	10.6	21.2	51.4	0.357	5.98U	40.8	153	0.936U
DUP030601A	U	Fill	5.69U	60.9	2.85U	2.85U	23.5	19.7	68.6	0.202	5.69U	73.5	73.8	1.07U
SB-21-2-4	U	Fill	6.04U	84	3.02U	3.02U	7.32	31.4	13.0	0.129	9.09	62.1	48.2	0.992U
SB-21-12-16	U	Fill	5.88U	47.8	2.94U	2.94U	13.4	19.3	61.1	0.284	5.88U	25.5	68.8	0.879U
SB-21-16-20	U	Fill	5.56	50.4	2.71U	2.71U	25.4	14.3	57.8	0.276	5.42U	40.1	45.0	1.08U
SB-21-28-30	U	Fill	5.23U	47.4	2.62U	2.62U	9.72	17.1	54.6	0.136	5.23U	20.7	43.2	0.772U
SB-21-44-48	S	Nat. Soil	5.86U	171	2.93U	2.93U	37.1	21.6	12.3	0.123U	12.1	69.2	61.9	1.25U
SB-21-60-64	S	Nat. Soil	6.38U	78.9	3.19U	3.19U	18.8	10.1	6.38U	0.131U	6.38U	33.4	32.1	0.886U
SB-22-0-2	U	Fill	5.56U	92.1	2.78U	2.78U	8.45	18.9	10.3	0.108U	5.56U	50.8	36.4	0.912U
SB-22-2-4	U	Fill	4.55U	52.3	2.27U	2.27U	6.78	11.1	36.7	0.121	4.55U	26.7	43.3	1.03U
SB-22-19-24	U	Fill	5.29U	31.8	2.64U	2.64U	9.38	31.1	138	0.161	5.29U	17.6	62.3	0.828U
SB-22-24-29	S	Nat. Soil	5.77U	33.2	2.89U	2.89U	8.44	5.33	92	0.161	5.77U	16.7	30.0	0.734U
SB-22-59-62	S	Nat. Soil	4.02U	13.3	2.01U	2.01U	4.51	2.01U	4.02U	0.111U	4.02U	5.01	10.9	0.901U
SB-23-0-2	U	Fill	6.58U	80.8	3.29U	3.29U	8.31	14.1	7.82	0.12U	6.58U	48.4	34.0	0.996U
DUP032201B	U	Fill	4.2U	49.0	2.1U	2.1U	7.32	18.4	7.20	0.106U	4.2U	39.6	33.5	1.02U
SB-23-2-4	U	Fill	5.01U	50.9	2.5U	2.5U	10.9	9.20	39.9	0.154	5.01U	19.5	30.1	0.944U
SB-23-14-19	U	Fill	6.81	266	2.42U	2.42U	18.5	37.6	298	0.18	10.3	23.6	54.4	1U
SB-23-24-29	S	Fill	4.45U	60.7	2.23U	2.23U	13.0	18.2	42.4	0.133	4.78	17.9	60.5	0.767U
SB-23-59-62	S	Nat. Soil	6.21U	38.3	3.1U	3.1U	13.3	5.57	6.21U	0.124U	6.21U	25.8	20.7	0.852U

**INORGANIC COMPOUNDS**  
**SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/ WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)**

	Saturated/Unsaturated	Unit	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
SB-24-0-2	U Fill		5.38U	74.6	2.69U	2.69U	13.5	11.6	151	0.650	5.38U	24.7	86.6	0.889U
SB-24-2-4	U Fill		5.44U	42.4	2.72U	2.72U	9.63	11.5	80.9	0.60	5.44U	23.9	53.7	0.748U
SB-24-8-12	U Fill		5.32U	131	2.66U	2.66U	9.75	13.8	338	0.412	5.32U	19.3	162	1.08U
SB-24-32-34	S Fill		6.43U	74.5	3.22U	3.22U	15.9	358	152	0.465	6.43U	31.6	106	1.24U
SB-24-40-42	S Nat. Soil		6.11U	40.1	3.06U	3.06U	7.44	4.36	14.5	0.112U	6.11U	14.4	12.5	0.745U
SB-24-44-48	S Nat. Soil		6.56U	186	3.28U	3.28U	41.9	21.2	12.1	0.26	15.0	72.5	63.0	1.11U
DUP030101A	S Nat. Soil		6.43U	175	3.22U	3.22U	43.2	20.5	13.8	0.126U	14.4	76.2	59.0	0.928U
SB-24-52-56	S Nat. Soil		5.26U	134	2.63U	2.63U	29.8	15.2	10.4	0.109U	11.1	55.2	45.3	0.958U
SB-25-0-5-2	U Fill		5.25U	56.9	2.63U	2.63U	10.3	14.6	67.3	0.289	5.25U	28.7	59.1	0.793U
SB-25-2-4	U Fill		5.4U	23.0	2.7U	2.7U	6.21	9.23	29.5	0.154	5.4U	13.1	21.5	0.879U
SB-25-16-20	U Fill		3.46U	93.6	1.73U	1.73U	9.10	10.1	85.3	0.346	3.76	22.4	104	0.942U
SB-25-28-32	S Fill		4.97U	50.5	2.49U	2.49U	17.2	8.63	20.9	0.454	4.97U	38.3	26.2	1.01U
SB-25-44-48	S Nat. Soil		5.47U	169	2.74U	2.74U	36.0	20.7	363	0.134U	11.7	74.5	61.9	1.32U
SB-25-56-60	S Nat. Soil		6.15U	160	3.07U	3.07U	31.0	18.8	10.7	0.131U	10.6	60.8	47.9	0.842U
SB-25-60-61	S Nat. Soil		6.48U	91.9	3.24U	3.24U	25.6	13.4	7.49	0.139U	11.5	52.1	46.3	0.87U
SB-26-0-5-2	U Fill		5.19U	50.1	2.6U	2.6U	14.2	27.9	15.7	0.203	5.19U	43.0	22.7	0.999U
SB-26-2-4	U Fill		5.11U	33.8	2.55U	2.55U	9.96	14.1	89.3	0.151	5.11U	18.7	59.8	0.883U
SB-26-8-12	U Fill		5.53U	54.2	2.77U	2.77U	13.3	6.60	20.1	0.125	5.53U	32.0	24.0	1.01U
DUP030201A	U Fill		5.25U	104	2.62U	2.62U	14.5	9.00	59.9	0.286	6.14	31.8	39.6	0.823U
SB-26-20-24	U Fill		5.36U	42.4	2.68U	2.68U	7.86	24.7	75.1	0.237	5.36U	18.0	41.9	1.01U
SB-26-32-36	S Fill		5.93U	5.93U	2.96U	2.96U	9.67	3.57	6.65	0.438	5.93U	10.8	5.93U	1.14U
SB-26-48-51	S Nat. Soil		5.74U	58.8	2.87U	2.87U	15.8	6.76	6.87	0.118U	5.74U	29.6	22.1	1.03U
SB-26-51-52	S Nat. Soil		5.9U	48.8	2.95U	2.95U	13.1	3.70	5.9U	0.122U	11.5	25.0	54.6	0.888U
SB-27-0-5-1.5	U Fill		5.6U	53.9	2.8U	2.8U	10.4	15.7	57.4	0.242	5.6U	33.6	40.5	0.933U
SB-27-2-4	U Fill		5.3U	42.0	2.65U	2.65U	11.5	24.8	104	0.266	5.3U	20.5	71.7	0.986U
SB-27-8-12	U Fill		7.7	203	3.23U	3.23U	22.6	89	634	4.53	6.46U	19.6	219	1.47
SB-27-16-20	U Nat. Soil		5.93U	44.7	2.96U	2.96U	11.8	4.69	18.5	0.154	5.93U	21.1	10.2	0.766U

**INORGANIC COMPOUNDS**  
 SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION  
 MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990  
 VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)

	Saturated/Unsaturated	Unit	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
SB-27-20-21	S	Nat. Soil	5.43U	5.43U	2.72U	2.72U	9.62	3.55	6.35	0.115U	5.43U	11.0	5.43U	1.04U
SB-28-0-5-2	U	Fill	6.13U	81.0	3.06U	3.06U	10.0	57.6	12.5	0.115	6.13U	56.0	33.3	1.23U
SB-28-2-4	U	Fill	6U	85.4	3U	3U	8.53	41.7	9.52	0.12U	6U	48.6	41.1	1.2U
SB-28-4-8	U	Fill	6.15U	73.1	3.08U	3.08U	12.6	16.8	76.3	0.814	6.15U	31.9	101	1.25U
SB-28-8-9-5	U	Nat. Soil	4.91U	5.88	2.46U	2.46U	5.26	2.46U	6.35	0.105U	4.91U	9.80	4.91U	1.09U
SB-29-0-5-2	U	Fill	4.24U	50.3	2.12U	2.12U	14.7	42.6	11.6	0.126U	4.24U	72.8	17.3	1.13U
DUP030501A	U	Fill	6.34U	19	3.17U	3.17U	11.6	56.3	22.0	0.149	6.34U	60.9	28.8	0.759U
SB-29-2-4	U	Fill	4.6U	67.2	2.3U	2.3U	13.2	31.7	12.8	0.114U	4.72	44.6	29.6	1.15U
SB-29-20-24	U	Fill	5.35U	17.3	2.67U	2.67U	5.78	3.64	14.1	0.134	5.35U	22.1	13.3	0.841U
SB-29-28-32	S	Fill	3.65U	72.9	1.83U	1.83U	16.3	4.99	11.0	0.153	4.11	22.7	22.6	1.03U
SB-29-48-52	S	Nat. Soil	5.55U	88.0	2.77U	2.77U	21.1	10.5	8.98	0.138U	9.46	35.9	37.4	1.36U
SB-29-52-53	S	Nat. Soil	5.07U	9.52	2.53U	2.53U	5.69	2.53U	5.07U	0.11U	5.07U	14.7	17.8	1.04U
SB-30-0-2	U	Nat. Soil	2.98U	25.5	1.49U	1.49U	11.1	5.28	7.46	0.0913U	2.98U	12.9	15.2	0.817U
DUP041201A	U	Nat. Soil	3.59U	33.5	1.8U	1.8U	10.7	5.67	6.34	0.103U	3.59U	16.5	18.7	0.889U
SB-30-2-4	U	Nat. Soil	2.78U	45.7	1.39U	1.39U	13.1	8.69	11.2	0.101U	3.72	21.6	19.8	1.03U
SB-30-8-12	S	Nat. Soil	3.83U	128	1.91U	1.91U	30.6	19.7	16.3	0.154	11.1	62.8	44.0	1.13U
SB-30-16-20	S	Nat. Soil	4.14U	159	2.15	2.07U	40.9	19.6	12.3	0.122U	14.2	72.0	66.6	1.27U
SB-31-0-2	U	Nat. Soil	5.03U	102	2.51U	2.51U	18.9	12.9	21.2	0.12U	7.42	35.5	51.0	1.17U
SB-31-2-4	U	Nat. Soil	5.3U	93.0	2.65U	2.65U	18.8	14.0	23.5	0.125U	6.19	36.7	37.9	0.976U
SB-31-4-8	U	Nat. Soil	5.8U	119	2.9U	2.9U	26.5	15.8	14.1	0.126U	9.05	54.3	37.1	0.856U
SB-31-8-12	U	Nat. Soil	6.55U	40.2	3.28U	3.28U	8.43	4.19	6.55U	0.124U	6.55U	16.7	12.8	0.960U
SB-31-16-20	S	Nat. Soil	5.76U	57.2	2.88U	2.88U	15.9	7.29	5.76U	0.125U	5.76U	30.4	24.3	0.718U
SB-32-0-2	U	Nat. Soil	5.09U	95.0	2.55U	2.55U	19.5	13.0	20.4	0.12U	6.62	37.2	43.0	0.871U
SB-32-2-4	U	Nat. Soil	5.57U	85.5	2.79U	2.79U	20.1	12.0	43.0	0.121U	6.32	38.2	27.8	0.995U
SB-32-4-8	U	Nat. Soil	6.04U	83.5	3.02U	3.02U	18.0	10.1	12.1	0.121U	6.04U	38.8	22.8	0.74U
SB-32-16-20	S	Nat. Soil	6.18U	63.5	3.09U	3.09U	20.6	6.00	6.18U	0.126U	6.18U	26.7	22.3	0.941U
SB-33-0-5-2	U	Fill	4.4U	99.7	2.2U	2.2U	8.10	6.71	32.9	0.174	4.4U	21.7	33.5	0.929U

**INORGANIC COMPOUNDS**  
 SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION  
 MACON 2 FORMER MGP FACILITY/ WILLIAMS PROJECT NO. 1100-2990  
 VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)

	Saturated/Unsaturated	Unit	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
SB-33-2-4	U	Fill	4.58U	81.1	2.29U	2.29U	22.0	43.4	65.8	0.541	4.58U	43.4	73.7	1.02U
SB-33-8-10	U	Fill	5.67U	11.1	2.84U	2.84U	28.7	5.74	5.67U	0.247	5.67U	58.9	6.33	1.02U
SB-33-10-14	U	Nat. Soil	5.43U	5.43U	2.72U	2.72U	5.58	2.72U	5.43U	0.105U	5.43U	10.6	5.43U	0.963U
SB-34-0-5-2	U	Fill	4.61U	87.2	2.31U	2.31U	9.40	42.2	149	0.241	8.29	17.3	160	0.82U
SB-34-2-4	U	Fill	4.93U	41.5	2.47U	2.47U	12.9	10.8	60.1	0.318	4.93U	24.5	58.8	0.87U
SB-34-4-8	U	Fill	4.92U	95.7	2.46U	2.46U	14.4	10.8	95.7	0.264	4.92U	18.8	85.4	1.08U
SB-34-8-10	U	Nat. Soil	5.04U	5.04U	2.52U	2.52U	2.52U	2.52U	5.04U	0.101U	5.04U	5.04U	5.04U	1.03U
SB-36-0-5-2	U	Fill	4.23U	24.8	2.12U	2.12U	12.3	8.42	8.98	0.0938U	4.23U	24.7	15.9	1.07U
SB-36-2-4	U	Fill	7.05	70.1	2.55U	2.55U	16.3	7.49	232	0.380	5.1U	79.3	339	0.908U
SB-36-4-6	U	Nat. Soil	6.56U	6.56U	3.28U	3.28U	5.63	3.28U	6.56U	0.122U	6.56U	14.6	6.56U	1.06U
SB-38-0-2	U	Fill	5.69U	54.4	2.84U	2.84U	11.5	11.9	135	0.248	5.69U	27.8	106	1.14U
DUP041201B	U	Fill	5.63U	57.1	2.82U	2.82U	8.49	11.6	94.3	0.182	5.63U	21.9	95.8	1.13U
SB-38-2-4	U	Fill	5.55U	63.9	2.77U	2.77U	9.08	12.4	116	0.336	5.55U	20.9	102	1.11U
SB-38-4-6.5	U	Fill	6.08U	21.6	3.04U	3.04U	9.68	5.54	18.1	0.117U	6.08U	17.2	15.8	1.22U
SB-38-6-5-9	U	Nat. Soil	6.72U	84.1	3.36U	3.36U	16.3	9.53	7.88	0.133U	6.72U	33.9	23.8	1.34U
SB-38-9-11.5	U	Nat. Soil	6.32U	91.5	3.16U	3.16U	23.5	11.3	6.33	0.119U	7.62	45.9	38.8	1.26U
SB-38-11.5-14	U	Nat. Soil	6.15U	83.4	3.08U	3.08U	24.6	11.9	7.47	0.122U	8.45	55.0	41.1	1.23U
SB-38-14-16.5	U	Nat. Soil	6.62U	63.2	3.31U	3.31U	17.7	10.1	6.62U	0.126U	8.24	32.8	35.1	1.32U
SB-38-16.5-19	U	Nat. Soil	6.65U	51.2	3.32U	3.32U	15.5	8.44	6.65U	0.131U	6.65U	32.3	27.7	1.33U
SB-38-19-21.5	S	Nat. Soil	6.51U	92.5	3.26U	3.26U	20.0	11.6	6.95	0.121U	6.88	36.6	40.2	1.3U
SB-38-21.5-24	S	Nat. Soil	6.35U	65.9	3.18U	3.18U	15.0	9.66	6.35U	0.118U	6.35U	34.6	27.0	1.27U
SB-38-24-26.5	S	Nat. Soil	6.64U	30.1	3.32U	3.32U	7.76	4.02	6.64U	0.124U	6.64U	15.9	13.3	1.33U
SB-38-26.5-29	S	Nat. Soil	6.53U	110	3.26U	3.26U	24.5	13.8	8.34	0.123U	8.28	48.1	42.5	1.31U
SB-38-29-31.5	S	Nat. Soil	6.92U	155	3.46U	3.46U	36.3	23.1	13.6	0.124U	11.1	68.4	57.6	1.38U
SB-38-31.5-34	S	Nat. Soil	6.84U	155	3.42U	3.42U	35.3	22.1	14.7	0.125U	10.3	71.9	50.8	1.37U
SB-38-34-36	S	Nat. Soil	5.96U	169	2.98U	2.98U	41.4	23.4	15.0	0.136U	15.9	78.3	60.7	0.991U
SB-38-36-38	S	Nat. Soil	6.27U	147	3.14U	3.14U	39.4	19.5	14.6	0.126U	12.1	75.0	46.9	1.2U

**INORGANIC COMPOUNDS**  
**SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)**

	Saturated/Unsaturated	Unit	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
UBL - Fill Material			7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils			DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
SB-38B-0-2	U	Fill	4.8U	53.8	2.4U	10.3	11.6	11.6	59.1	0.132	4.8U	23.8	65.2	0.971U
DUF041301A	U	Fill	5.41U	52.9	2.7U	11.2	11.0	72.6	0.156	0.156	5.41U	23.6	69.5	0.915U
SB-38B-2-4	U	Fill	4.89U	69.9	2.44U	10.2	11.5	164	0.318	0.318	4.89U	20.3	145	0.749U
SB-38B-4-6	U	Fill	4.1U	59.4	2.05U	11.6	12.3	77.9	0.188	0.188	14.4	20.4	76.6	0.881U
SB-38B-6-8	U	Fill	4.54U	63.3	2.27U	11.6	21.1	65.9	0.385	0.385	4.54U	50.1	62.4	0.678U
SB-38B-8-10	U	Fill	4.26U	52.8	2.13U	16.0	17.1	73.2	0.329	0.329	6.05	19.6	61.7	0.795U
SB-38B-10-12	U	Fill	4.27U	49.7	2.13U	9.43	11.8	75.7	0.293	0.293	4.27U	19.0	64.1	0.801U
SB-39-0.5-2	U	Fill	6.3U	53.6	3.15U	6.34	17.5	8.97	0.12U	0.12U	6.3U	39.0	20.1	1.01U
SB-39-4-8	U	Fill	4.98U	58.0	2.49U	12.8	39.8	68.0	0.262	0.262	5.70	30.4	32.9	0.958U
SB-39-8-12.5	U	Fill	5.17U	42.3	2.59U	14.7	27.1	23.1	0.191	0.191	5.17U	34.1	21.6	1.03U
SB-40-0.5-2	U	Fill	5.92U	51.2	2.96U	10.2	18.3	25.7	0.185	0.185	5.92U	46.8	43.3	1.06U
SB-40-2-4	U	Fill	5.58U	83.7	2.79U	11.8	10.5	135	0.402	0.402	5.58U	26.9	136	1.15U
SB-40-16-20	U	Fill	5.03U	74.0	2.51U	5.83	13.4	140	0.498	0.498	5.03U	12.4	105	1.03U
SB-40-24-28	S	Fill	4.27U	53.9	2.13U	8.94	6.36	17.2	0.0996	0.0996	5.80	13.7	24.0	0.985U
SB-40-40-44	S	Nat. Soil	6.52U	119	3.26U	27.0	13.7	7.16	0.118U	0.118U	10.0	48.4	47.6	0.985U
DUF032001A	S	Nat. Soil	6.45U	104	3.23U	24.1	14.2	6.82	0.127U	0.127U	8.93	45.0	43.1	0.889U
SB-40-56-58	S	Nat. Soil	6.27U	104	3.14U	31.3	16.6	10.3	0.108U	0.108U	10.4	58.9	44.9	0.897U
SB-41-0-2	U	Fill	5.56U	92.0	2.78U	12.0	35.2	11.2	0.101U	0.101U	6.82	59.8	48.5	1.08U
SB-41-2-4	U	Fill	4.75U	63.2	2.37U	11.3	12.9	7.25	0.101U	0.101U	5.45	43.6	37.3	0.878U
SB-41-19-24	U	Fill	4.97U	79	2.49U	10.8	9.66	166	0.228	0.228	4.97U	18.5	219	0.961U
SB-41-24-29	S	Fill	6.39U	212	3.19U	13.0	9.02	234	1.33	1.33	6.39U	18.6	84.4	0.998U
SB-41-54-59	S	Nat. Soil	5.78U	114	2.89U	31.3	17.3	10.4	0.125U	0.125U	10.8	58.1	46.3	1.09U
SB-43-2-4	U	Fill	3.79U	69.2	1.9U	1.9U	7.01	166	0.242	0.242	3.79U	14	96.9	0.854U
SB-43-4-8	U	Fill	2.98U	70.4	1.49U	14.5	11.7	170	0.274	0.274	3.1	18.6	124	0.928U
SB-43-8-12	U	Fill	3.86U	25	1.93U	9.11	9.22	99.2	0.139	0.139	3.86U	28	71.2	1.03U
SB-43-12-16	U	Fill	4.14U	78.6	2.07U	16.7	12	113	0.253	0.253	4.91	24.6	86.8	0.971U
SB-43-16-20	U	Fill	3.07U	55.9	1.54U	13.90	9.16	51.3	0.134U	0.134U	3.86	25.3	55.7	1.09U

**INORGANIC COMPOUNDS**  
 SOIL SAMPLES - COMPLIANCE STATUS INVESTIGATION  
 MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990  
 VALUES LISTED IN MILLIGRAMS PER KILOGRAM (mg/kg)

Saturated/Unsaturated	Unit	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
UBL - Fill Material		7.05	115	DL	DL	28.7	43.4	204	0.541	14.4	58.9	257	DL
UBL - Nat. Soils		DL	275	DL	DL	52.8	35.7	26.5	DL	29.7	120	80.3	DL
SB-43-20-24	U Fill	4.19	89	1.79U	1.79U	17.80	11.1	379	0.184	3.58U	16.4	257	1.06U
SB-43-24-28	S Fill	4.24U	37.1	2.12U	2.12U	18.40	7.34	104	0.109U	4.24U	31	69.1	0.706U
SB-43-32-36	S Fill	3.94U	67.7	1.97U	1.97U	12.6	6.3	66.9	0.114U	4.36	16.5	49.8	0.829U
SB-43-36-40	S Nat. Soil	5.22U	158.0	2.61U	2.61U	31.3	13.8	12.8	0.123U	13	58.9	54.9	1.22U
SB-43-40-44	S Nat. Soil	5.9U	197	2.95U	2.95U	51.5	26.4	17.9	0.130U	15.8	96.6	68.6	0.995U
SB-43-44-48	S Nat. Soil	10.5U	338	5.27U	5.27U	87.2	45.5	26.5	0.237U	29.7	52	125	1.81U
SB-43-48-52	S Nat. Soil	4.94U	204	2.47U	2.47U	44.7	25.6	16	0.132U	16.3	88.1	68.3	1.04U
SB-43-52-56	S Nat. Soil	5.53U	219	2.77U	2.77U	41	24.2	15.6	0.131U	14.7	75	68	1.23U
SB-43-56-60	S Nat. Soil	3.77U	116	1.88U	1.88U	29.3	17.7	9.9	0.138U	10.8	59.6	46	1.22U
SB-43-60-64	S Nat. Soil	4.94U	50.4	2.47U	2.47U	15.7	7.39	4.94U	0.139U	5.89	28.4	24.9	1.13U
SB-44-0-2	U Fill	NA	NA	NA	NA	NA	NA	12.1	NA	NA	NA	NA	NA
SB-44-5-7	U Fill	NA	NA	NA	NA	NA	NA	25.3	NA	NA	NA	NA	NA
SB-44-10-12	U Fill	NA	NA	NA	NA	NA	NA	181	NA	NA	NA	NA	NA
SB-44-15-17	U Nat. Soil	NA	NA	NA	NA	NA	NA	5.53U	NA	NA	NA	NA	NA
SB-44-20-21	U Nat. Soil	NA	NA	NA	NA	NA	NA	5.54U	NA	NA	NA	NA	NA
SB-45-0-2	U Fill	NA	NA	NA	NA	NA	NA	58.5	NA	NA	NA	NA	NA
SB-45-5-7	U Fill	NA	NA	NA	NA	NA	NA	35.6	NA	NA	NA	NA	NA
SB-45-10-12	U Fill	NA	NA	NA	NA	NA	NA	425	NA	NA	NA	NA	NA
SB-45-15-17	U Fill	NA	NA	NA	NA	NA	NA	1070	NA	NA	NA	NA	NA
SB-45-18.5-20	U Fill	NA	NA	NA	NA	NA	NA	38.6	NA	NA	NA	NA	NA
DUP082003A	U Fill	NA	NA	NA	NA	NA	NA	37.8	NA	NA	NA	NA	NA
SB-46-0-2	U Fill	NA	NA	NA	NA	NA	NA	15.6	NA	NA	NA	NA	NA
SB-46-0-2	U Fill	NA	NA	NA	NA	NA	NA	70.6	NA	NA	NA	NA	NA
SB-46-0-2	U Fill	NA	NA	NA	NA	NA	NA	34.5	NA	NA	NA	NA	NA
SB-46-0-2	U Fill	NA	NA	NA	NA	NA	NA	20.0	NA	NA	NA	NA	NA
MW-6-34-39	S Nat. Soil	6.43U	173	3.21U	3.21U	26.7	23.5	24.6	0.125U	10.6	68.3	54.5	1.19U
MW-6-44-49	S Nat. Soil	6.36U	114	3.18U	3.18U	25.5	14.5	7.52	0.123U	11.6	49.5	46.9	1.14U

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**COMPLINACE STATUS INVESTIGATION REPORT - Revised September 5, 2003**  
**FORMER MACON 2 MGP FACILITY, MACON, GEORGIA**  
**WILLIAMS PROJECT NO. 1100-2990**

## **C-2 COMPLIANCE STATUS INVESTIGATION**

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**VOLATILE ORGANIC COMPOUNDS**  
**GROUNDWATER SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER LITER (ug/L)**

	Date	Benzene	Carbon Disulfide	Ethylbenzene	Methylene Chloride	Methyl-tert-butyl-ether	Toluene	Xylenes	Total Detected VOCs
UBL	--	DL	DL	DL	DL	DL	DL	DL	--
MW-1	March-01	9.1	5U	5U	5U	5U	5U	5U	9.1
	August-03	5U	5U	5U	5U	N/A	5U	5U	0
MW-2	March-01	5U	5U	5U	5U	8.5	5U	5U	8.5
	August-03	5U	5U	5U	5U	N/A	5U	5U	0
MW-3	March-01	5U	5U	5U	5U	5U	5U	5U	0
Dup 031201A	March-01	5U	5U	5U	5U	5U	5U	5U	0
	August-03	5U	5U	5U	5U	N/A	5U	5U	0
Dup082003A	August-03	5U	5U	5U	5U	N/A	5U	5U	0
MW-4	March-01	5U	5U	5U	5U	18	5U	5U	18
	August-03	5U	5U	5U	5U	N/A	5U	5U	0
MW-5	March-01	5U	5U	5U	5U	5U	5U	5U	0
Dup032901A	March-01	5U	5U	5U	5U	5U	5U	5U	0
	August-03	5U	5U	5U	5U	N/A	5U	5U	0
MW-6	March-01	5U	5U	5U	5U	5U	5U	5U	0
	August-03	5U	5U	5U	5U	N/A	5U	5U	0
MW-7	August-03	5U	5U	5U	5U	N/A	5U	5U	0

**SEMI-VOLATILE ORGANIC COMPOUNDS**  
**GROUNDWATER SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER LITER (ug/L)**

UBL	Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Phenol	Total Detected SVOCs
MW-1	March-01	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
	August-03	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
MW-2	March-01	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
	August-03	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	12
MW-3	March-01	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
Dup 031201A	March-01	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
	August-03	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
Dup082003A	August-03	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
MW-4	March-01	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
	August-03	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
MW-5	March-01	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	13
Dup032901A	March-01	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	12
	August-03	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	14
MW-6	March-01	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
	August-03	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
MW-7	August-03	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0

**INORGANIC COMPOUNDS**  
**GROUNDWATER SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER LITER (mg/L)**

UBL	Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Vanadium	Zinc	T-Cyanide
		DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL	DL
MW-1	March-01	0.02U	0.02U	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.0290	0.01U
	August-03	0.02U	0.02U	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
MW-2	March-01	0.02U	0.102	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.0639
	August-03	0.02U	0.178	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.048
MW-3	March-01	0.02U	0.856	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
Dup 031201A	March-01	0.02U	0.857	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
	August-03	0.02U	0.699	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
Dup082003A	August-03	0.02U	0.692	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
MW-4	March-01	0.02U	0.328	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
	August-03	0.02U	0.389	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
MW-5	March-01	0.02U	1.93	0.01U	0.01U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
Dup032901A	March-01	0.02U	1.90	0.01U	0.01U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
	August-03	0.02U	0.85	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
MW-6	March-01	0.02U	0.167	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
	August-03	0.02U	0.168	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U
MW-7	August-03	0.02U	0.328	0.005U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.01U	0.02U	0.01U

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**COMPLINACE STATUS INVESTIGATION REPORT - Revised September 5, 2003**  
**FORMER MACON 2 MGP FACILITY, MACON, GEORGIA**  
**WILLIAMS PROJECT NO. 1100-2990**

## **D-2 COMPLIANCE STATUS INVESTIGATION**

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# BORING LOG

BORING NUMBER <u>SB-44</u>	PAGE <u>1</u>	OF <u>1</u>	PROJECT NUMBER <u>1100-2990</u>
PROJECT <u>Macon 2 MGP</u>		DRILLING CONTRACTOR <u>Georgia Power Company</u>	
BORING LOCATION _____		GROUND ELEVATION _____	
DRILLING METHOD AND EQUIPMENT <u>HSA with continuous sampler</u>		TOP OF CASING ELEVATION _____	
DATE <u>8/20/03</u>	START <u>730</u>	FINISH <u>820</u>	LOGGER <u>Mike Dillon</u>

DEPTH BELOW GROUND SURFACE (feet)	SAMPLE					REMARKS	SYMBOLIC LOG	SOIL DESCRIPTION/COMMENTS
	SAMPLE INTERVAL	TYPE AND NUMBER	TIME	REC. %	OVM PEAK/AVG. (ppm)			NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL
0	0-3.5	0-2	730	100%			FILL	Asphalt
5	3.5-8.5	5-7	740	100%			FILL	3-3.5' Clayey sandy silt - dark yellowish orange, fine sand, slightly cohesive, dry
10	8.5-13.5	10-12	750	80%			FILL	6.5-8.5 Same as above; less clay content, no cohesiveness, glass and brick fragments
15	13.5-18.5	15-17	800	95%			SAP	13.5-18.5' Clayey silty sand - saprolite - mottled grayish orange and pale red, dry, relict foliation almost vertical friable
20	18.5-21	20-21	810	95%			SAP	Boring Termination 21' at bedrock
25								

(Continued on next page if over 25 feet deep)



# BORING LOG

BORING NUMBER <u>SB-45</u> PAGE <u>1</u> OF <u>1</u>	PROJECT NUMBER <u>1100-2990</u>
PROJECT <u>Macon 2 MGP</u>	DRILLING CONTRACTOR <u>Georgia Power Company</u>
BORING LOCATION _____	GROUND ELEVATION _____
DRILLING METHOD AND EQUIPMENT <u>HSA with continuous sampler</u>	TOP OF CASING ELEVATION _____
DATE <u>8/20/03</u> START <u>830</u> FINISH <u>920</u>	LOGGER <u>Mike Dillon</u>

DEPTH BELOW GROUND SURFACE (feet)	SAMPLE					REMARKS	SYMBOLIC LOG	SOIL DESCRIPTION/COMMENTS
	SAMPLE INTERVAL	TYPE AND NUMBER	TIME	REC. %	OVM PEAK/AVG. (ppm)			NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL
0							FILL	Asphalt
	0-3.5	0-2	830	100%				0-3.5' Sandy clay - light brown, plastic, medium sand, stiff, dry
								3.5-5' Same as above
5	3.5-8.5	5-7	840	80%				5-5.5' Clayey sand - dusky yellowish brown, very cohesive, medium sand, dry 5.5-6.5' Same as above; pale yellowish brown 6.5-7.5' Sandy clay - medium light gray, very fine sand, plastic, 3" brick fragment at base
								8.5-13.5' Clayey gravelly sand - dusky yellowish brown, abundant organic material, wood, sticks, glass, brick fragments
10	8.5-13.5	10-12	850	95%				13.5-17.5' Same as above - abundant particle board
15	13.5-18.5	15-17	900	80%				
20	18.5-23.5	18.5-20	910	80%			▽	18.5-23.5' Clayey sand - dusky yellowish green, medium sand, slightly cohesive, wet at 20' bgs
25								Boring Termination 23.5'

(Continued on next page if over 25 feet deep)



# BORING LOG

BORING NUMBER <u>SB-46</u> PAGE <u>1</u> OF <u>1</u>	PROJECT NUMBER <u>1100-2990</u>
PROJECT <u>Macon 2 MGP</u>	DRILLING CONTRACTOR <u>Georgia Power Company</u>
BORING LOCATION _____	GROUND ELEVATION _____
DRILLING METHOD AND EQUIPMENT <u>HSA with continuous sampler</u>	TOP OF CASING ELEVATION _____
DATE <u>8/20/03</u> START <u>940</u> FINISH <u>1040</u>	LOGGER <u>Mike Dillon</u>

DEPTH BELOW GROUND SURFACE (feet)	SAMPLE						SYMBOLIC LOG	SOIL DESCRIPTION/COMMENTS
	SAMPLE INTERVAL	TYPE AND NUMBER	TIME	REC. %	OVM PEAK/AVG. (ppm)	REMARKS		NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL
0	0-3.5	0-2	950	100%			FILL Asphalt 0-0.5' Gravelly silty sand - dusky yellowish brown, brick frags., dry, very fine sand, slightly cohesive, glass 0.5-6' Same as above; light brown	
5		5-7	10000					95%
10	8.5-13.5	10-12	1010	95%			8.5-12' Gravelly clayey fine sand - moderate yellowish brown, slightly cohesive, minor amount of rounded river gravel (quartz)	
15		15-17	1020				80%	12-13.5' Gravelly sand clay - dusky yellowish brown, gravel size rocks & brick fragments, dry, plastic, stiff 13.5-18.5' 3" brick at top - Clayey sandy silt - grayish orange, dry, very fine sand, slightly cohesive, glass
20	18.5-23.5			25%			1.25' of Gravelly sand - dusky yellowish brown, gravel size rocks & brick, medium sand, glass, saturated (difficult to determine depth)	
25							Boring Termination 23.5'	



# BORING LOG

BORING NUMBER <u>MW-07</u> PAGE <u>1</u> OF <u>2</u>	PROJECT NUMBER <u>1100-2990</u>
PROJECT <u>Macon 2 MGP</u>	DRILLING CONTRACTOR <u>Georgia Power Company</u>
BORING LOCATION _____	GROUND ELEVATION _____
DRILLING METHOD AND EQUIPMENT <u>HSA</u>	TOP OF CASING ELEVATION _____
DATE <u>8/19/03</u> START <u>1400</u> FINISH <u>1630</u>	LOGGER <u>Mike Dillon</u>

DEPTH BELOW GROUND SURFACE (feet)	SAMPLE						SYMBOLIC LOG	SOIL DESCRIPTION/COMMENTS
	SAMPLE INTERVAL	TYPE AND NUMBER	TIME	REC. %	OVM PEAK/AVG. (ppm)	REMARKS		NAME, GRADATION OR PLASTICITY, PARTICLE SIZE, DISTRIBUTION, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY, USCS GROUP SYMBOL
0						Logged from Cuttings	FILL	Asphalt Clay - light brown, cohesive, plastic, dry Gravelly sand - moderate yellowish brown, dry, fine sand, medium size gravel
5								Same as above; slight cohesiveness, slightly moist
10								Gravelly clay - plastic, moderate brown, small gravel
15								Sandy clay - dark yellowish brown, stiff, medium sand, plastic, dry
20								Clayey fine sand - dusky yellowish brown, cohesive, dry
25							▽	Gravelly sandy clay - dusky yellowish brown, gravel rock & brick fragments, glass, wet

(Continued on next page if over 25 feet deep)



**APPENDIX F**  
**QUALITY ASSURANCE / QUALITY CONTROL**  
**SAMPLES**

**VOLATILE ORGANIC COMPOUNDS**  
**QA/QC SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER LITER (ug/L)**

	Sample Collected From	Benzene	Carbon Disulfide	Ethylbenzene	Methylene Chloride	Methyl-tert-butyl-ether	Toluene	Xylenes	Total Detected VOCs
FB030101A	NA	5U	5U	5U	5U	N/A	5U	5U	0
FB030201A	NA	5U	5U	5U	10U	N/A	5U	5U	0
FB030501A	NA	5U	5U	5U	10U	N/A	5U	5U	0
FB030601A	NA	5U	5U	5U	10U	N/A	5U	5U	0
FB030701A	NA	5U	5U	5U	10U	N/A	5U	5U	0
FB031201A	NA	5U	5U	5U	5U	5U	5U	5U	0
FB031401A	NA	5U	5U	5U	10U	N/A	5U	5U	0
FB032001A	NA	5U	5U	5U	10U	N/A	5U	5U	0
FB032101A	NA	5U	5U	5U	10U	5U	5U	5U	0
FB032201A	NA	5U	5U	5U	10U	N/A	5U	5U	0
FB032601A	NA	5U	5U	5U	10U	N/A	5U	5U	0
FB041201A	NA	5U	5U	5U	10U	5U	5U	5U	0
FB041201B	NA	5U	5U	5U	10U	5U	5U	5U	0
FB041301A	NA	5U	5U	5U	10U	5U	5U	5U	0
RB030101A	Liner	5U	5U	5U	10U	N/A	5U	5U	0
RB030201A	Liner	5U	5U	5U	10U	N/A	5U	5U	0
RB030501A	Liner	5U	5U	5U	10U	N/A	5U	5U	0
RB030601A	Liner	5U	5U	5U	10U	N/A	5U	5U	0
RB030701A	Liner	5U	5U	5U	10U	N/A	5U	5U	0
RB031401A	Liner	5U	5U	5U	10U	N/A	5U	5U	0
RB032001A	Split spoon	5U	5U	5U	10U	N/A	5U	5U	0
RB032101A	Liner	5U	5U	5U	10U	N/A	5U	5U	0
RB032201A	Liner	5U	5U	5U	10U	5U	5U	5U	0
RB032601A	Split spoon	5U	5U	5U	10U	N/A	5U	5U	0
RB032901A	Peristaltic pump and tubing	5U	5U	5U	10U	N/A	5U	5U	0
RB041201A	Liner	5U	5U	5U	10U	5U	5U	5U	0
RB041201B	Gloves	5U	5U	5U	10U	5U	5U	5U	0
RB041301A	Liner	5U	5U	5U	10U	5U	5U	5U	0
RB082103	Tubing	5U	5U	5U	5U	N/A	5U	5U	0
TB030101A	NA	5U	5U	5U	5U	N/A	5U	5U	0
TB030201A	NA	5U	5U	5U	10U	N/A	5U	5U	0
TB030701A	NA	5U	5U	5U	10U	N/A	5U	5U	0
TB031601A	NA	5U	5U	5U	10U	N/A	5U	5U	0
TB032001A	NA	5U	5U	5U	10U	N/A	5U	5U	0
TB032301A	NA	5U	5U	5U	10U	5U	5U	5U	0
TB032301B	NA	5U	5U	5U	10U	N/A	5U	5U	0
TB032901A	NA	5U	5U	5U	10U	5U	5U	5U	0
TB033001A	NA	5U	5U	5U	5U	5U	5U	5U	0
TB040301A	NA	5U	5U	5U	5U	5U	5U	5U	0
TB041301A	NA	5U	5U	5U	10U	5U	5U	5U	0
TB041301B	NA	5U	5U	5U	10U	5U	5U	5U	0
TB041301C	NA	5U	5U	5U	10U	5U	5U	5U	0
TB082103	NA	5U	5U	5U	5U	N/A	5U	5U	0
TAP WATER	Loading dock spicket	5U	5U	5U	5U	N/A	5U	5U	0

NA - Not Available

N/A - Not Analyzed

**SEMI-VOLATILE ORGANIC COMPOUNDS**  
**QA/QC SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MICROGRAMS PER LITER (ug/L)**

Sample Collected From	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Phenol	Pyrene	Total Detected SVOCs
RB030101A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB030201A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB030501A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB030601A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB030701A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB031401A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB032001A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB032101A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB032201A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB032601A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB032901A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB041201A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB041201B	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB041301A	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
RB082103	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0
TAP WATER	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	10U	0

N/A - Not Analyzed

**INORGANIC COMPOUNDS**  
**QA/QC SAMPLES-COMPLIANCE STATUS INVESTIGATION**  
**MACON 2 FORMER MGP FACILITY/WILLIAMS PROJECT NO. 1100-2990**  
**VALUES LISTED IN MILLIGRAMS PER LITER (mg/L)**

Sample Collected From	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Vanadium	T-Cyanide
RB030101A	0.02U	0.108	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB030201A	0.02U	0.107	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB030501A	0.02U	0.109	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB030601A	0.02U	0.109	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB030701A	0.02U	0.02U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB031401A	0.02U	0.02U	0.005U	0.01U	0.0106	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB032001A	0.02U	0.02U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB032101A	0.02U	0.02U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB032201A	0.02U	0.02U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB032601A	0.02U	0.02U	0.005U	0.0196	0.01U	0.0254	0.0005U	0.02U	0.02U	0.01U	0.01U
RB032901A	0.02U	0.02U	0.01U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB041201A	0.02U	0.02U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB041201B	0.02U	0.02U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB041301A	0.02U	0.02U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
RB082103	0.02U	0.02U	0.005U	0.01U	0.01U	0.01U	0.0005U	0.02U	0.02U	0.01U	0.01U
TAP WATER	0.02U	0.0215	0.005U	0.01U	0.0258	0.01U	0.0005U	0.02U	0.0585	0.01U	0.01U

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**COMPLINACE STATUS INVESTIGATION REPORT - Revised September 5, 2003**  
**FORMER MACON 2 MGP FACILITY, MACON, GEORGIA**  
**WILLIAMS PROJECT NO. 1100-2990**

**G-2 WILLIAMS LABORATORY QA/QC  
REPORTS**

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## Analytical Data Validation Report

**Client:** Georgia Power Company

**Project Location:** Macon, Georgia

**Project Number:** 1100-2990

**Laboratory:** Analytical Environmental Services, Inc.

**Date of Sample Collection:** August 20, 2003

**Samples Collected By:** Mike Dillon

**Date Samples Received By Laboratory:** August 21, 2003

**Laboratory Remarks:** None

**Laboratory Code:** 0308662

### Analytical Data Validation Report Continued

Project Number: 1100-2990

Laboratory Code: 0308662

Sample ID# SB-44-0-2, SB-44-5-7, SB-44-10-12, SB-44-15-17, SB-44-20-21, SB-45-0-2, SB-45-5-7, SB-45-10-12, SB-45-15-17, SB-45-18.5-20, SB-46-0-2, SB-46-5-7, SB-46-10-12, SB-46-15-17, DUP082003A, DRUM-1

Analysis: Total Lead

Method: SW6010B

Matrix: Soil

Preservative: Ice for soil

Holding Time: 6 months

Date of Collection: August 20, 2003

Date of Analysis: August 25, 2003

Samples Analyzed Within Holding Time: Yes

Laboratory Method Blank Less Than Laboratory Reporting Limits: Yes

Surrogate Spike Recovery Within Quality Control Limits: N/A

Laboratory Control Sample (LCS) Percent Recovery Within Advisory Limits: Yes

Relative Percent Difference (RPD) Between Field Duplicate Sample and Laboratory Duplicate Sample Below Quality Control Limits: Yes

Matrix Spike Percent Recovery Within Advisory Limits: Yes

Trip Blank Result Less Than Laboratory Reporting Limits: N/A

Equipment Blank Result Less Than Laboratory Reporting Limits: No equipment blank collected.

Comparison of Duplicate Results: A duplicate sample of SB-45-18.5-20 was collected and identified as DUP082003A. A comparison of the results is shown in the table below.

#### Comparison of Sample and Duplicate Results (mg/kg-dry)

Parameter	SB-45-18.5-20	DUP082003A
Total Lead	38.6	37.8

## Analytical Data Validation Report

**Client:** Georgia Power Company

**Project Location:** Macon, Georgia

**Project Number:** 1100-2990

**Laboratory:** Analytical Environmental Services, Inc.

**Date of Sample Collection:** August 20 & 21, 2003

**Samples Collected By:** Pete Robinson

**Date Samples Received By Laboratory:** August 21, 2003

**Laboratory Remarks:** None

**Laboratory Code:** 0308663

**Analytical Data Validation Report Continued**

**Project Number:** 1100-2990

**Laboratory Code:** 0308663

**Sample ID#** MW-5, MW-2, MW-3, MW-4, MW-7, MW-6, MW-1, DUP082003, RB082103

**Analysis:** Total Metals

**Method:** SW6020 for all metals except mercury, 7470A for mercury

**Matrix:** Water

**Preservative:** Nitric Acid and Ice

**Holding Time:** 6 months for all metals except mercury, 28 days for mercury

**Date of Collection:** August 20, 2003

**Date of Analysis:** August 25 & 26, 2003

**Samples Analyzed Within Holding Time:** Yes

**Laboratory Method Blank Less Than Laboratory Reporting Limits:** Yes

**Surrogate Spike Recovery Within Quality Control Limits:** N/A

**Laboratory Control Sample (LCS) Percent Recovery Within Advisory Limits:** Yes, except where noted in the QC Report.

**Relative Percent Difference (RPD) Between Field Duplicate Sample and Laboratory Duplicate Sample Below Quality Control Limits:** Yes

**Matrix Spike Percent Recovery Within Advisory Limits:** Yes, except where noted in the QC Report and the Case Narrative

**Trip Blank Result Less Than Laboratory Reporting Limits:** N/A

**Equipment Blank Result Less Than Laboratory Reporting Limits:** Yes

**Comparison of Duplicate Results:** A duplicate sample of MW-3 was collected and identified as DUP082003. All of the results for both the sample and the duplicate were below laboratory detection limits with the exception of barium. It was detected at 699 µg/l in the regular sample and at 692 µg/l in the duplicate sample.

**Analytical Data Validation Report Continued**

**Project Number:** 1100-2990  
**Laboratory Code:** 0308663

**Sample ID#** MW-5, MW-2, MW-3, MW-4, MW-7, MW-6, MW-1, DUP082003, RB082103

**Analysis:** Semivolatile Organic Compounds

**Method:** SW8270C

**Matrix:** Water

**Preservative:** Ice

**Holding Time:** 14 days until extraction, 40 days after extraction

**Date of Collection:** August 20, 2003

**Date of Analysis:** August 22, 23, and 25, 2003

**Samples Analyzed Within Holding Time:** Yes

**Laboratory Method Blank Less Than Laboratory Reporting Limits:** Yes

**Surrogate Spike Recovery Within Quality Control Limits:** Yes

**Laboratory Control Sample (LCS) Percent Recovery Within Advisory Limits:** Yes

**Relative Percent Difference (RPD) Between MS and MSD Below Quality Control Limits:** Yes

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Percent Recoveries Within Advisory Limits:** Yes

**Trip Blank Result Less Than Laboratory Reporting Limits:** N/A

**Equipment Blank Result Less Than Laboratory Reporting Limits:** Yes

**Comparison of Duplicate Results:** A duplicate sample of MW-3 was collected and identified as DUP082003. All of the results for both the sample and the duplicate were below laboratory detection limits.

**Analytical Data Validation Report Continued**

**Project Number:** 1100-2990

**Laboratory Code:** 0308663

**Sample ID#** MW-5, MW-2, MW-3, MW-4, MW-7, MW-6, MW-1, DUP082003, RB082103, TB082103

**Analysis:** Volatile Organic Compounds

**Method:** SW8260B

**Matrix:** Water

**Preservative:** Hydrochloric Acid and Ice

**Holding Time:** 14 days

**Date of Collection:** August 20, 2003

**Date of Analysis:** August 22, and 25, 2003

**Samples Analyzed Within Holding Time:** Yes

**Laboratory Method Blank Less Than Laboratory Reporting Limits:** Yes

**Surrogate Spike Recovery Within Quality Control Limits:** Yes

**Laboratory Control Sample (LCS) Percent Recovery Within Advisory Limits:** Yes

**Relative Percent Difference (RPD) Between MS and MSD Below Quality Control Limits:** Yes

**Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Percent Recoveries Within Advisory Limits:** Yes

**Trip Blank Result Less Than Laboratory Reporting Limits:** Yes

**Equipment Blank Result Less Than Laboratory Reporting Limits:** Yes

**Comparison of Duplicate Results:** A duplicate sample of MW-3 was collected and identified as DUP082003. All of the results for both the sample and the duplicate were below laboratory detection limits.

## Analytical Data Validation Report Continued

Project Number: 1100-2990

Laboratory Code: 0308663

Sample ID# MW-5, MW-2, MW-3, MW-4, MW-7, MW-6, MW-1, DUP082003, RB082103,

Analysis: Cyanide

Method: SW9014

Matrix: Water

Preservative: Sodium Hydroxide and Ice

Holding Time: 14 days

Date of Collection: August 20, 2003

Date of Analysis: August 21, 2003

Samples Analyzed Within Holding Time: Yes

Laboratory Method Blank Less Than Laboratory Reporting Limits: Yes

Surrogate Spike Recovery Within Quality Control Limits: N/A

Laboratory Control Sample (LCS) Percent Recovery Within Advisory Limits: Yes

Relative Percent Difference (RPD) Between Field Duplicate Sample  
and Laboratory Duplicate Sample Below Quality Control Limits: Yes

Matrix Spike Percent Recovery Within Advisory Limits: Yes

Trip Blank Result Less Than Laboratory Reporting Limits: N/A

Equipment Blank Result Less Than Laboratory Reporting Limits: Yes

Comparison of Duplicate Results: A duplicate sample of MW-3 was collected and identified as DUP082003. All of the results for both the sample and the duplicate were below laboratory detection limits.

## Analytical Data Validation Report

**Client:** Georgia Power Company

**Project Location:** Macon, Georgia

**Project Number:** 1100-2990

**Laboratory:** Analytical Environmental Services, Inc.

**Date of Sample Collection:** August 20, 2003

**Samples Collected By:** Mike Dillon

**Date Samples Received By Laboratory:** August 21, 2003

**Laboratory Remarks:** None

**Laboratory Code:** 0308828

**Analytical Data Validation Report Continued**

**Project Number:** 1100-2990

**Laboratory Code:** 0308828

**Sample ID#** SB-45-15-17

**Analysis:** ICP Metals, SPLP

**Method:** SW1312/6010B

**Matrix:** Soil

**Preservative:** Ice

**Holding Time:** 14 days

**Date of Collection:** August 20, 2003

**Date of Analysis:** August 27, 2003

**Samples Analyzed Within Holding Time:** Yes

**Laboratory Method Blank Less Than Laboratory Reporting Limits:** Yes

**Surrogate Spike Recovery Within Quality Control Limits:** N/A

**Laboratory Control Sample (LCS) Percent Recovery Within Advisory Limits:** Yes

**Relative Percent Difference (RPD) for Laboratory Duplicate Sample Below Quality Control Limits:** Yes

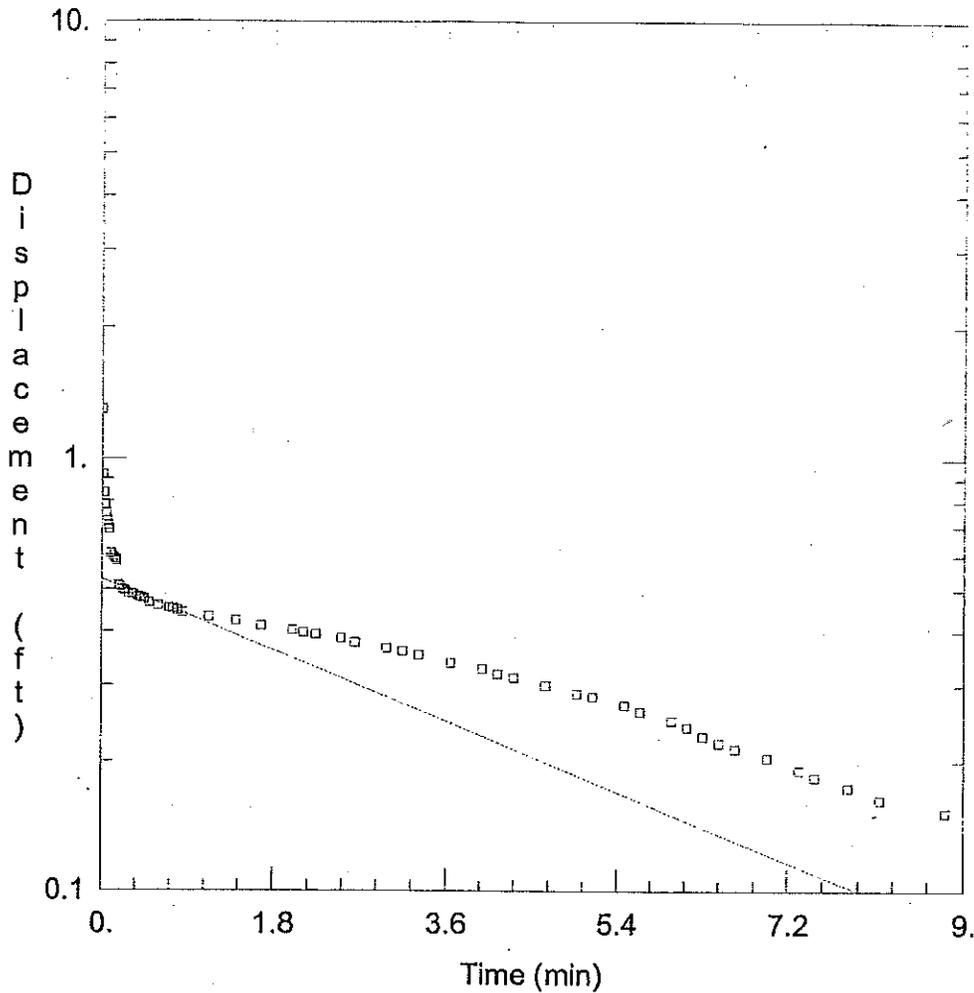
**Matrix Spike Percent Recovery Within Advisory Limits:** Yes

**Trip Blank Result Less Than Laboratory Reporting Limits:** N/A

**Equipment Blank Result Less Than Laboratory Reporting Limits:** No equipment blank collected.

**Comparison of Duplicate Results:** No duplicate sample collected.

**APPENDIX I**  
**SLUG TEST DATA**



MW-01-OUT

Data Set: L:\Mike Dillon\1100\2990\mw1out.agt

Date: 08/22/03

Time: 14:48:37

PROJECT INFORMATION

Company: Williams Environmental

Client: Georgia Power Company

Project: 1100-2990

Test Location: Macon, Ga

Test Well: MW-01

Test Date: 4/13/01

AQUIFER DATA

Saturated Thickness: 40. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-01)

Initial Displacement: 1.297 ft

Casing Radius: 0.08333 ft

Wellbore Radius: 0.2813 ft

Well Skin Radius: 0.2813 ft

Screen Length: 9.39 ft

Total Well Penetration Depth: 8.85 ft

Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.0007049 ft/min

$\alpha = 0.5284$

Data Set: L:\Mike Dillon\1100\2990\mw1out.aqt  
 Title: MW-01-OUT  
 Date: 08/22/03  
 Time: 14:48:43

### PROJECT INFORMATION

Company: Williams Environmental  
 Client: Georgia Power Company  
 Project: 1100-2990  
 Location: Macon, Ga  
 Test Date: 4/13/01  
 Test Well: MW-01

### AQUIFER DATA

Saturated Thickness: 40. ft  
 Anisotropy Ratio (Kz/Kr): 1.

### SLUG TEST WELL DATA

Initial Displacement: 1.297 ft  
 Casing Radius: 0.08333 ft  
 Wellbore Radius: 0.2813 ft  
 Well Skin Radius: 0.2813 ft  
 Screen Length: 9.39 ft  
 Total Well Penetration Depth: 8.85 ft  
 Gravel Pack Porosity: 0.3

No. of observations: 66

Observation Data					
Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.0001	1.297	0.2829	0.49	3.149	0.36
0.0112	0.919	0.3172	0.488	3.316	0.353
0.0224	0.835	0.3359	0.486	3.649	0.338
0.0335	0.784	0.3767	0.482	3.983	0.328
0.0447	0.749	0.3989	0.48	4.149	0.319
0.0559	0.719	0.4224	0.478	4.316	0.313
0.067	0.702	0.4472	0.475	4.649	0.3
0.0782	0.689	0.5015	0.467	4.983	0.287
0.0894	0.606	0.5957	0.46	5.149	0.283
0.1005	0.604	0.7077	0.454	5.483	0.27
0.1117	0.597	0.7495	0.452	5.649	0.261
0.1229	0.593	0.7939	0.448	5.983	0.249
0.134	0.589	0.8409	0.443	6.149	0.24
0.1452	0.587	1.121	0.433	6.316	0.229
0.1564	0.582	1.411	0.424	6.483	0.221
0.1675	0.512	1.677	0.413	6.649	0.214
0.1787	0.51	1.993	0.403	6.983	0.204
0.1899	0.508	2.111	0.398	7.316	0.191
0.2127	0.501	2.237	0.394	7.483	0.184
0.2252	0.499	2.51	0.386	7.816	0.174
0.2384	0.497	2.659	0.377	8.149	0.163
0.2524	0.495	2.983	0.366	8.816	0.152

### SOLUTION

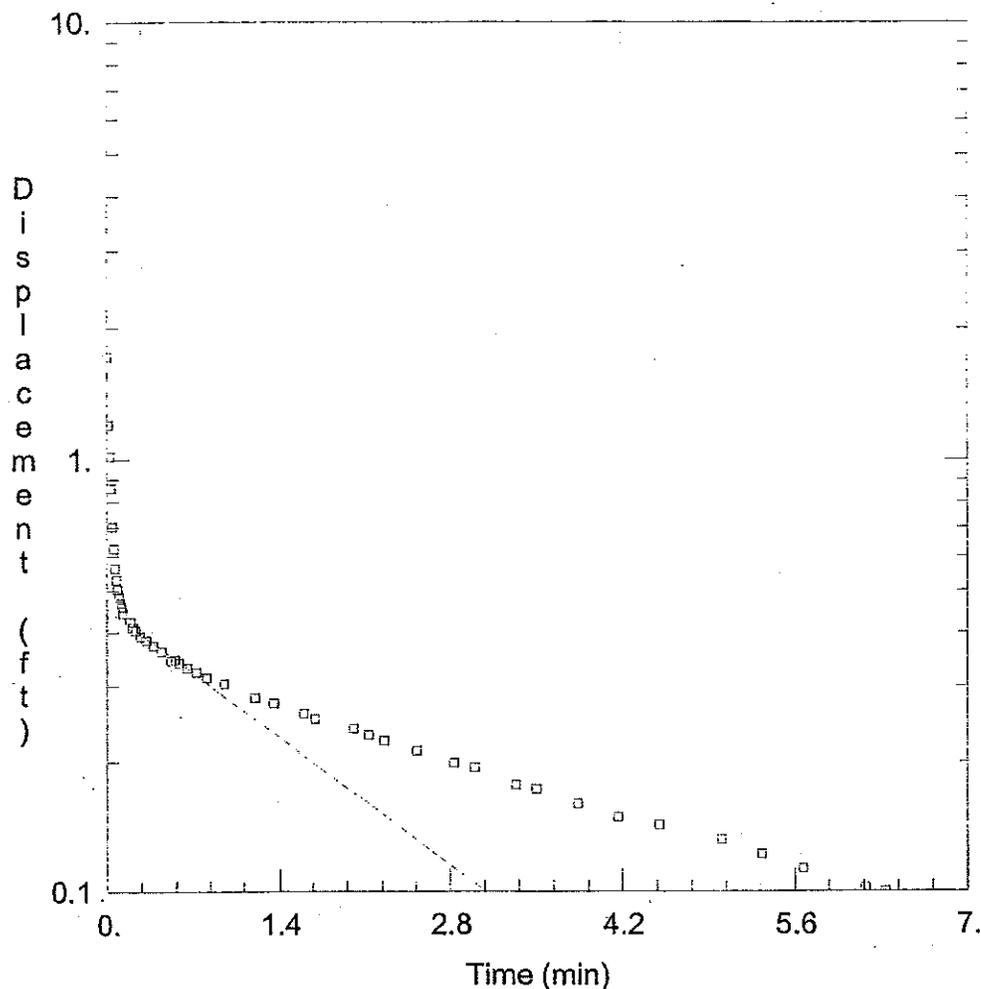
Aquifer Model: Unconfined  
 Solution Method: Bouwer-Rice

### VISUAL ESTIMATION RESULTS

#### Estimated Parameters

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Parameter	Estimate	
K	0.0007049	ft/min
y0	0.5284	ft



MW-02-OUT

Data Set: L:\Mike Dillon\1100\2990\mw2out.aqt

Date: 08/22/03

Time: 14:49:07

PROJECT INFORMATION

Company: Williams Environmental

Client: Georgia Power Company

Project: 1100-2990

Test Location: Macon, Ga

Test Well: MW-02

Test Date: 4/13/01

AQUIFER DATA

Saturated Thickness: 40. ft

Anisotropy Ratio ( $K_z/K_r$ ): 1.

WELL DATA (MW-02)

Initial Displacement: 1.722 ft

Casing Radius: 0.08333 ft

Wellbore Radius: 0.2813 ft

Well Skin Radius: 0.2813 ft

Screen Length: 9.39 ft

Total Well Penetration Depth: 8.17 ft

Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined

Solution Method: Bower-Rice

$K = 0.001612 \text{ ft/min}$

$\alpha = 0.1500 \text{ ft}^2$

Data Set: L:\Mike Dillon\1100\2990\mw2out.aqt  
 Title: MW-02-OUT  
 Date: 08/22/03  
 Time: 14:49:12

### PROJECT INFORMATION

Company: Williams Environmental  
 Client: Georgia Power Company  
 Project: 1100-2990  
 Location: Macon, Ga  
 Test Date: 4/13/01  
 Test Well: MW-02

### AQUIFER DATA

Saturated Thickness: 40. ft  
 Anisotropy Ratio (Kz/Kr): 1.

### SLUG TEST WELL DATA

Initial Displacement: 1.722 ft  
 Casing Radius: 0.08333 ft  
 Wellbore Radius: 0.2813 ft  
 Well Skin Radius: 0.2813 ft  
 Screen Length: 9.39 ft  
 Total Well Penetration Depth: 8.17 ft  
 Gravel Pack Porosity: 0.3

No. of observations: 47

Observation Data					
Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.001	1.722	0.2713	0.391	2.131	0.231
0.011	1.202	0.3185	0.383	2.256	0.224
0.022	1.016	0.3747	0.372	2.529	0.212
0.033	0.86	0.4413	0.361	2.835	0.199
0.044	0.702	0.5205	0.344	3.002	0.194
0.055	0.625	0.5502	0.346	3.335	0.177
0.066	0.563	0.5815	0.34	3.502	0.173
0.077	0.53	0.6498	0.331	3.835	0.16
0.088	0.503	0.7267	0.323	4.168	0.149
0.099	0.483	0.8128	0.314	4.502	0.143
0.11	0.468	0.9623	0.304	5.002	0.132
0.121	0.458	1.206	0.282	5.335	0.122
0.132	0.443	1.351	0.274	5.668	0.113
0.187	0.423	1.602	0.259	6.168	0.102
0.209	0.411	1.696	0.252	6.335	0.1
0.2317	0.404	2.012	0.239		

### SOLUTION

Aquifer Model: Unconfined  
 Solution Method: Bouwer-Rice

### VISUAL ESTIMATION RESULTS

#### Estimated Parameters

Parameter	Estimate	
K	0.001612	ft/min
y0	0.4533	ft



Data Set: L:\Mike Dillon\1100\2990\mw4out.aqt  
 Title: MW-04-OUT  
 Date: 08/22/03  
 Time: 14:49:31

PROJECT INFORMATION

Company: Williams Environmental  
 Client: Georgia Power Company  
 Project: 1100-2990  
 Location: Macon, Ga  
 Test Date: 4/13/01  
 Test Well: MW-04

AQUIFER DATA

Saturated Thickness: 40. ft  
 Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Initial Displacement: 1.119 ft  
 Casing Radius: 0.08333 ft  
 Wellbore Radius: 0.2813 ft  
 Well Skin Radius: 0.2813 ft  
 Screen Length: 9.39 ft  
 Total Well Penetration Depth: 8.7 ft  
 Gravel Pack Porosity: 0.3

No. of observations: 20

		Observation Data			
Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.001	1.119	0.077	0.047	0.154	0.015
0.011	0.396	0.088	0.036	0.165	0.013
0.022	0.199	0.099	0.03	0.176	0.013
0.033	0.113	0.11	0.025	0.187	0.01
0.044	0.098	0.121	0.021	0.2317	0.01
0.055	0.066	0.132	0.019	0.2442	0.008
0.066	0.06	0.143	0.021		

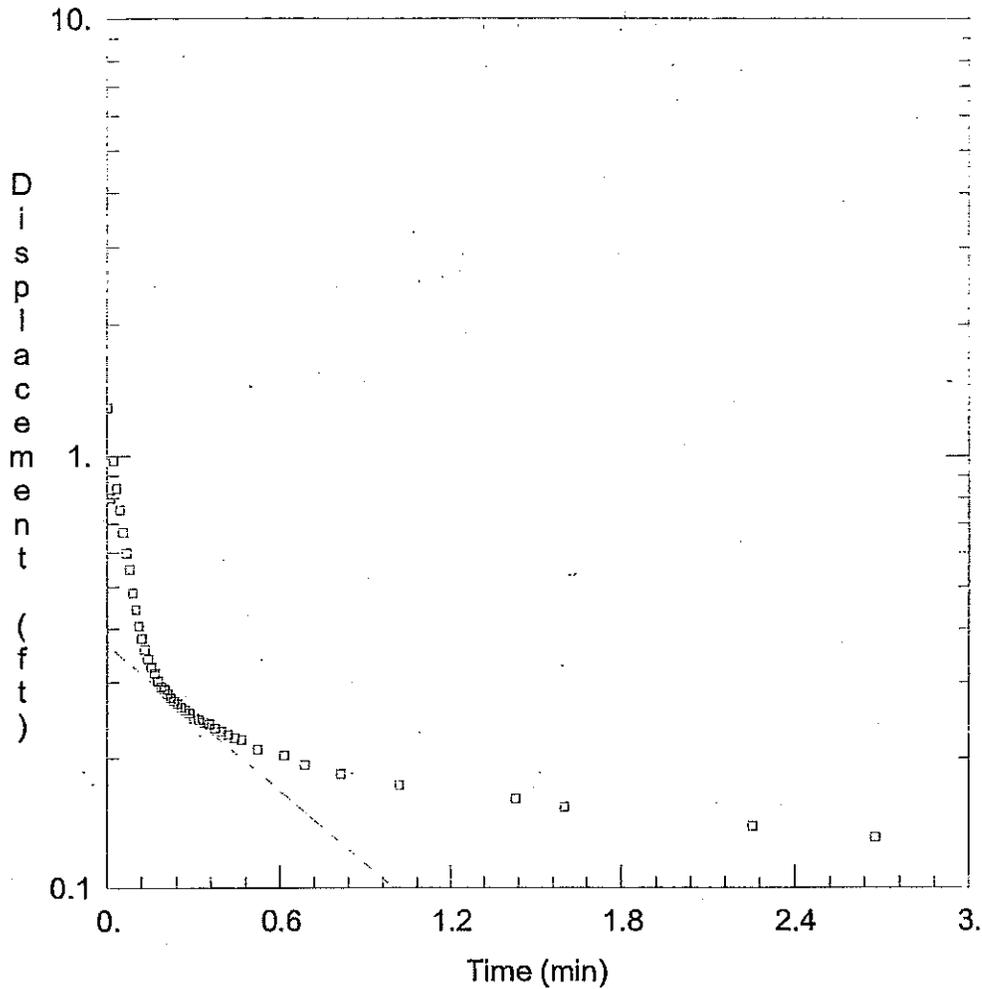
SOLUTION

Aquifer Model: Unconfined  
 Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.05886	ft/min
y0	0.1847	ft



MW-05-OUT

Data Set: L:\Mike Dillon\1100\2990\mw5out.aqt

Date: 08/22/03

Time: 14:50:31

PROJECT INFORMATION

Company: Williams Environmental

Client: Georgia Power Company

Project: 1100-2990

Test Location: Macon, Ga

Test Well: MW-05

Test Date: 4/13/01

AQUIFER DATA

Saturated Thickness: 40. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-05)

Initial Displacement: 1.289 ft

Casing Radius: 0.08333 ft

Wellbore Radius: 0.3438 ft

Well Skin Radius: 0.3438 ft

Screen Length: 15. ft

Total Well Penetration Depth: 8.19 ft

Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined

Solution Method: Bower-Rice

Data Set: L:\Mike Dillon\1100\2990\mw5out.aqt  
 Title: MW-05-OUT  
 Date: 08/22/03  
 Time: 14:50:37

PROJECT INFORMATION

Company: Williams Environmental  
 Client: Georgia Power Company  
 Project: 1100-2990  
 Location: Macon, Ga  
 Test Date: 4/13/01  
 Test Well: MW-05

AQUIFER DATA

Saturated Thickness: 40. ft  
 Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Initial Displacement: 1.289 ft  
 Casina Radius: 0.08333 ft  
 Wellbore Radius: 0.3438 ft  
 Well Skin Radius: 0.3438 ft  
 Screen Length: 15. ft  
 Total Well Penetration Depth: 8.19 ft  
 Gravel Pack Porosity: 0.3

No. of observations: 44

Observation Data					
Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.001	1.289	0.165	0.315	0.3747	0.235
0.011	0.801	0.176	0.302	0.3957	0.231
0.022	0.976	0.187	0.293	0.4178	0.227
0.033	0.843	0.198	0.289	0.4413	0.223
0.044	0.753	0.209	0.283	0.4662	0.221
0.055	0.668	0.22	0.276	0.5205	0.21
0.066	0.599	0.2317	0.272	0.6147	0.203
0.077	0.548	0.2442	0.268	0.6872	0.193
0.088	0.484	0.2573	0.263	0.8128	0.184
0.099	0.443	0.2713	0.259	1.018	0.173
0.11	0.405	0.2862	0.255	1.43	0.161
0.121	0.379	0.3018	0.248	1.602	0.154
0.132	0.358	0.3185	0.246	2.256	0.139
0.143	0.34	0.3362	0.242	2.678	0.131
0.154	0.325	0.3548	0.24		

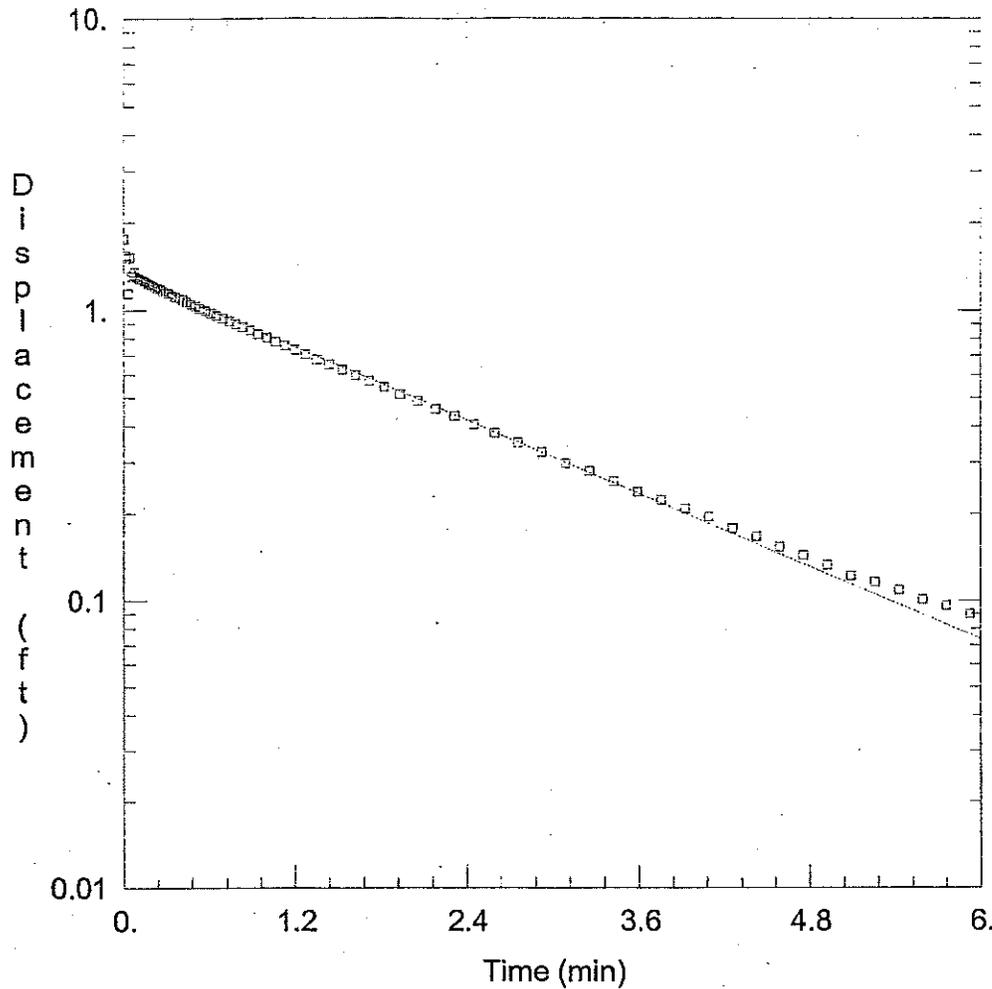
SOLUTION

Aquifer Model: Unconfined  
 Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	0.003787	ft/min
y0	0.3663	ft



MW-06-IN

Data Set: L:\Mike Dillon\1100\2990\mw6in.aqt

Date: 08/22/03

Time: 14:49:44

PROJECT INFORMATION

Company: Williams Environmental

Client: Georgia Power Company

Project: 1100-2990

Test Location: Macon, Ga

Test Well: MW-06

Test Date: 4/13/01

AQUIFER DATA

Saturated Thickness: 40. ft

Anisotropy Ratio ( $K_z/K_r$ ): 1.

WELL DATA (MW-06)

Initial Displacement: 1.757 ft

Casing Radius: 0.08333 ft

Wellbore Radius: 0.3438 ft

Well Skin Radius: 0.3438 ft

Screen Length: 10. ft

Total Well Penetration Depth: 16.31 ft

Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

Data Set: L:\Mike Dillon\1100\2990\mw6in.aqt  
 Title: MW-06-IN  
 Date: 08/22/03  
 Time: 14:49:50

### PROJECT INFORMATION

Company: Williams Environmental  
 Client: Georgia Power Company  
 Project: 1100-2990  
 Location: Macon, Ga  
 Test Date: 4/13/01  
 Test Well: MW-06

### AQUIFER DATA

Saturated Thickness: 40. ft  
 Anisotropy Ratio (Kz/Kr): 1.

### SLUG TEST WELL DATA

Initial Displacement: 1.757 ft  
 Casing Radius: 0.08333 ft  
 Wellbore Radius: 0.3438 ft  
 Well Skin Radius: 0.3438 ft  
 Screen Length: 10. ft  
 Total Well Penetration Depth: 16.31 ft  
 Gravel Pack Porosity: 0.3

No. of observations: 79

Observation Data					
Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.001	1.757	0.3892	1.097	2.054	0.488
0.011	1.54	0.4155	1.088	2.179	0.458
0.022	1.506	0.4435	1.067	2.311	0.433
0.033	1.14	0.4732	1.048	2.452	0.405
0.044	1.521	0.5045	1.033	2.6	0.379
0.055	1.305	0.5377	1.013	2.758	0.351
0.066	1.32	0.5728	0.996	2.925	0.326
0.077	1.35	0.6102	0.979	3.091	0.298
0.088	1.3	0.6497	0.958	3.258	0.281
0.099	1.287	0.6915	0.94	3.425	0.259
0.11	1.279	0.7358	0.919	3.591	0.238
0.121	1.27	0.7828	0.898	3.758	0.223
0.132	1.262	0.8327	0.876	3.925	0.208
0.143	1.253	0.8853	0.855	4.091	0.195
0.1547	1.245	0.9412	0.829	4.258	0.178
0.1672	1.234	1.	0.808	4.425	0.167
0.1803	1.225	1.063	0.782	4.591	0.154
0.1943	1.215	1.129	0.758	4.758	0.144
0.2092	1.206	1.2	0.733	4.925	0.133
0.2248	1.195	1.274	0.707	5.091	0.122
0.2415	1.185	1.353	0.679	5.258	0.116
0.2592	1.172	1.437	0.653	5.425	0.109
0.2778	1.161	1.525	0.625	5.591	0.101
0.2977	1.148	1.619	0.598	5.758	0.096
0.3187	1.137	1.718	0.572	5.925	0.09
0.3408	1.122	1.824	0.544		
0.3643	1.11	1.935	0.514		

### SOLUTION

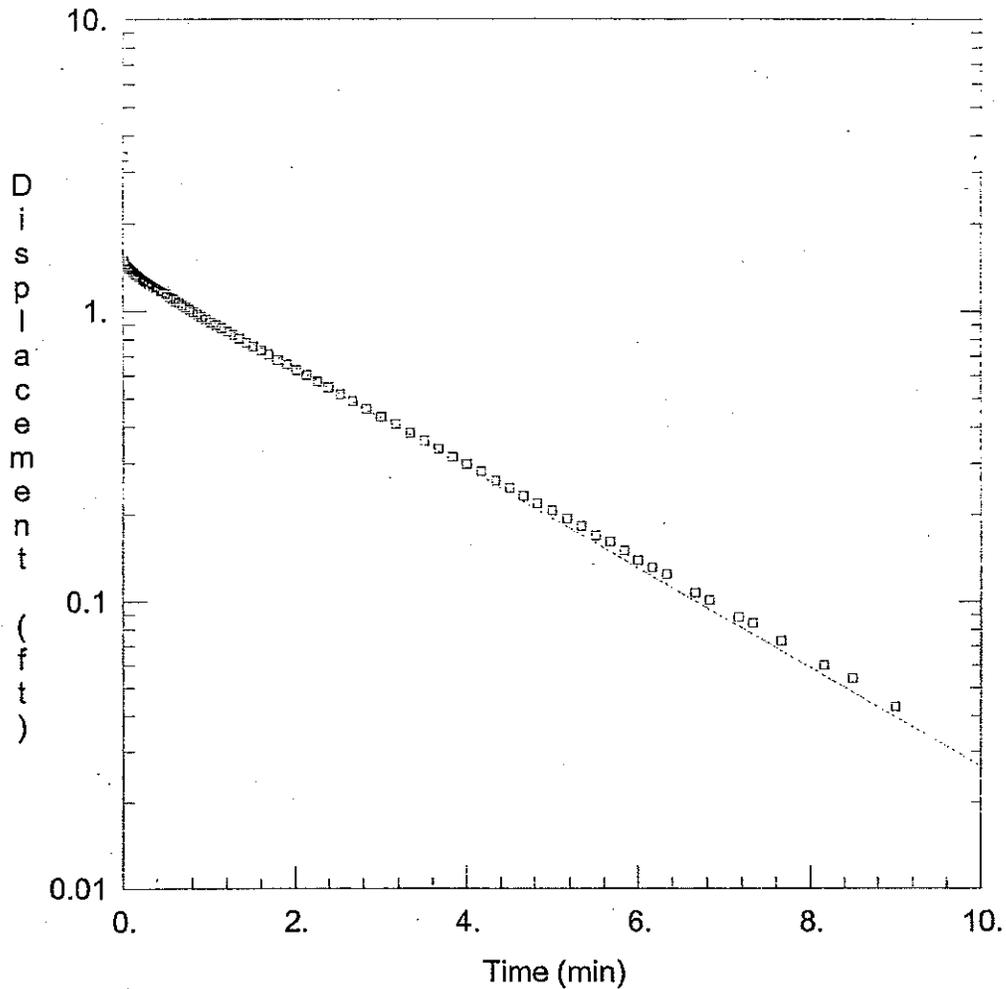
Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTS

Estimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
K	0.0003948	ft/min
y0	1.339	ft



MW-06-OUT

Data Set: L:\Mike Dillon\1100\2990\mw6out.aqt

Date: 08/22/03

Time: 14:50:01

PROJECT INFORMATION

Company: Williams Environmental

Client: Georgia Power Company

Project: 1100-2990

Test Location: Macon, GA

Test Well: MW-06

Test Date: 4/13/01

AQUIFER DATA

Saturated Thickness: 40. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-06)

Initial Displacement: 3.396 ft

Casing Radius: 0.08333 ft

Wellbore Radius: 0.3438 ft

Well Skin Radius: 0.3438 ft

Screen Length: 10. ft

Total Well Penetration Depth: 16.31 ft

Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined

Solution Method: Bower-Rice

Data Set: L:\Mike Dillon\1100\2990\mw6out.aqt  
 Title: MW-06-OUT  
 Date: 08/22/03  
 Time: 14:50:08

### PROJECT INFORMATION

Company: Williams Environmental  
 Client: Georgia Power Company  
 Project: 1100-2990  
 Location: Macon, GA  
 Test Date: 4/13/01  
 Test Well: MW-06

### AQUIFER DATA

Saturated Thickness: 40. ft  
 Anisotropy Ratio (Kz/Kr): 1.

### SLUG TEST WELL DATA

Initial Displacement: 3.396 ft  
 Casing Radius: 0.08333 ft  
 Wellbore Radius: 0.3438 ft  
 Well Skin Radius: 0.3438 ft  
 Screen Length: 10. ft  
 Total Well Penetration Depth: 16.31 ft  
 Gravel Pack Porosity: 0.3

No. of observations: 96

Observation Data					
Time (min)	Displacement (ft)	Time (min)	Displacement (ft)	Time (min)	Displacement (ft)
0.001	3.396	0.4178	1.174	2.529	0.518
0.011	1.486	0.4413	1.163	2.678	0.49
0.022	1.456	0.4662	1.154	2.835	0.46
0.033	1.428	0.4925	1.148	3.002	0.433
0.044	1.428	0.5205	1.12	3.168	0.409
0.055	1.411	0.5502	1.109	3.335	0.381
0.066	1.405	0.5815	1.097	3.502	0.358
0.077	1.396	0.6147	1.077	3.668	0.336
0.088	1.386	0.6498	1.064	3.835	0.315
0.099	1.373	0.6872	1.047	4.002	0.298
0.11	1.358	0.7267	1.03	4.168	0.281
0.121	1.358	0.7685	1.011	4.335	0.261
0.132	1.341	0.8128	0.994	4.502	0.246
0.143	1.332	0.8598	0.974	4.668	0.231
0.154	1.326	0.9097	0.955	4.835	0.218
0.165	1.317	0.9623	0.936	5.002	0.206
0.176	1.309	1.018	0.914	5.168	0.193
0.187	1.302	1.077	0.895	5.335	0.182
0.198	1.294	1.14	0.874	5.502	0.169
0.209	1.287	1.206	0.85	5.668	0.161
0.22	1.281	1.277	0.829	5.835	0.15
0.2317	1.272	1.351	0.803	6.002	0.139
0.2442	1.266	1.43	0.78	6.168	0.131
0.2573	1.259	1.514	0.756	6.335	0.124
0.2713	1.251	1.602	0.732	6.668	0.107
0.2862	1.242	1.696	0.709	6.835	0.101
0.3018	1.234	1.796	0.679	7.168	0.088
0.3185	1.225	1.901	0.655	7.335	0.084
0.3362	1.216	2.012	0.625	7.668	0.073
0.3548	1.208	2.131	0.602	8.168	0.06
0.3747	1.197	2.256	0.572	8.502	0.054

<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>	<u>Time (min)</u>	<u>Displacement (ft)</u>
0.3957	1.184	2.388	0.546	9.002	0.043

SOLUTION

Aquifer Model: Unconfined  
Solution Method: Bouwer-Rice

VISUAL ESTIMATION RESULTSEstimated Parameters

<u>Parameter</u>	<u>Estimate</u>	
K	0.000324	ft/min
y0	1.41	ft

**APPENDIX K**  
**WELL CONSTRUCTION FORMS**

**TYPE II MONITORING WELL**

<p><b>WELL NUMBER</b></p> <p style="text-align: center;">MW-07</p>			
<p><b>DRILLER</b> Georgia Power</p> <p><b>DRILLING METHOD</b> HSA 8.25" OD</p> <p><b>DEVELOPMENT METHOD</b> Pump</p>	<p><b>TYPE OF SURFACE SEAL</b> Flush</p> <p><b>RISER PIPE ID</b> 2"</p> <p><b>TYPE OF RISER PIPE</b> PVC</p>		
<p><b>WELL MATERIALS USED</b></p> <p>FEET OF 5 FOOT RISER _____</p> <p>FEET OF 10 FOOT RISER 20'</p> <p>FEET OF SCREEN 10'</p> <p>CAPS/PLUGS 1 cap/ 1 plug</p> <p>BAGS OF SAND 10</p> <p>BAGS OF BENTONITE PELLETS _____</p> <p>BUCKETS OF BENTONITE PELLETS 1</p> <p>BAGS OF CEMENT _____</p> <p>BAGS OF CONCRETE MIX _____</p> <p>HOLE COVERS _____</p> <p>OTHER _____</p>	<p><b>DEPTH OF TOP OF SEAL</b> 13.8'</p> <p><b>TYPE OF SEAL</b> Bentonite</p> <p><b>DEPTH OF TOP OF SAND PACK</b> 15.8'</p> <p><b>DEPTH OF TOP OF SCREEN</b> 17.5'</p> <p><b>DEPTH OF TOP OF GROUNDWATER</b> approx. 22'</p> <p><b>TYPE OF SCREEN</b> PVC 0.01 slot</p> <p><b>LENGTH OF SCREEN</b> 15'</p> <p><b>DEPTH TO BOTTOM OF SCREEN</b> 32.5'</p> <p><b>DEPTH TO BOTTOM OF BORING</b> 32.5'</p>		
<p><b>DATE INSTALLED</b> 08/19/2003</p>	<p><b>PROJECT NO.</b> 1100-2990</p>	<p><b>WELL NO.</b> MW-07</p>	<p><b>Williams Environmental Services, Inc.</b> A Subsidiary of Williams Group International, Inc.</p>

**APPENDIX L**  
**WATER QUALITY SAMPLING FORMS**

# WATER QUALITY SAMPLING FORM

Client:	MACON II MGP	Project Number:	11002990
Sample Number:	MW-1	Date:	8/20/03
Sample Type:	GROUNDWATER	Time:	
Sampled By:	PNR	Weather:	CLEAR 83 <sup>o</sup> F

**WELL DEVELOPMENT**

Depth to Water:	7.32	Well Diameter:	2"
Depth of Well:	17.89		
Height of Water Column:	10.57		
Water Column (gal):			
Gallons Purged:	5.5 GALS (WELL DRY)		

**WATER SAMPLE COLLECTION DATA**

Method of Removal:	PUMP	Pump Time:	
Method of Sampling:	PUMP	Pump On:	1057
Time of Sampling:	8/12/03 0830	Pump Off:	1133
	9.06 NTU'S		

**FIELD ANALYSES**

	Well Vol. 1	Well Vol. 2	Well Vol. 3	Well Vol. 4	Well Vol. 5
Temperature:	25.8	24.7	24.7	24.5	24.4
pH:	7.44	5.63	5.71	5.05	5.35
Specific Conductance:	21.0 ms/m	21.4	22.2	19.0	20.2
Dissolved Oxygen:	10.24	8.16	7.06	6.58	6.10
Redox Potential:	135	176	178	233	220
Gallons Purged	0	1.0	2.0	3.0	4.0
NTU's	27.6	26.6	12.9	57.2	57.2
Time:	1058	1105	1112	1119	1126

Reason for Sampling:				
Other (Specify):				
Method of Shipment:	HAND DELIVER			
Physical Appearance:	CLEAR W/NO ODOR			
Type of Analysis:	VOC'S	SVOC'S	METALS	CN
Container Size and Type:	2@40ml	2@1liter	500ml	500ml
Preservative:	HCL	ICE	HNO3	NAOH

**REMARKS AND OBSERVATIONS**

Well dry @ 5.5 gals. Let recharge overnight. Sampled 8/21/03

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Site Location:	MACON, GA	 Williams Environmental Services, Inc. <small>A subsidiary of Williams Group International, Inc.</small>			
Date:	8/20/03	Project No.	11002990	Well I.D.	MW-1

# WATER QUALITY SAMPLING FORM

Client:	MACON II MGP	Project Number:	11002990
Sample Number:	MW-1	Date:	8/20/03
Sample Type:	GROUNDWATER	Time:	
Sampled By:	PNR	Weather:	CLEAR 83°F

**WELL DEVELOPMENT**

Depth to Water: 7.32 Well Diameter: 2"  
 Depth of Well: 17.89  
 Height of Water Column: 10.57  
 Water Column (gal): \_\_\_\_\_  
 Gallons Purged: 5.5 GALS (WELL DRY)

**WATER SAMPLE COLLECTION DATA**

Method of Removal: PUMP Pump Time: \_\_\_\_\_  
 Method of Sampling: PUMP Pump On: 1057  
 Time of Sampling: 8/12/03 0830 Pump Off: 1133  
 9.06 NTU'S

**FIELD ANALYSES**

	FINAL				
Temperature:	24.2				
pH:	5.24				
Specific Conductance:	19.5				
Dissolved Oxygen:	5.47				
Redox Potential:	231				
Gallons Purged	5.0				
NTU's	>1000				
Time:	1133				

Reason for Sampling: \_\_\_\_\_  
 Other (Specify): \_\_\_\_\_  
 Method of Shipment: HAND DELIVER  
 Physical Appearance: CLEAR W/NO ODOR  
 Type of Analysis: VOC'S SVOC'S METALS CN  
 Container Size and Type: 2@40ml 2@1liter 500ml 500ml  
 Preservative: HCL ICE HNO3 NAOH

**REMARKS AND OBSERVATIONS**

Well dry @ 5.5 gals. Let recharge overnight. Sampled 8/21/03  
 \_\_\_\_\_  
 \_\_\_\_\_

Site Location: <u>MACON, GA</u>	 Williams Environmental Services, Inc. <small>A subsidiary of Williams Group International, Inc.</small>	
Date: <u>8/20/03</u>	Project No. <u>11002990</u>	Well I.D. <u>MW-1 Pg.2</u>

# WATER QUALITY SAMPLING FORM

Client:	MACON II MGP	Project Number:	11002990
Sample Number:	MW-2	Date:	8/20/03
Sample Type:	GROUNDWATER	Time:	
Sampled By:	PNR	Weather:	SUNNY 83°F

**WELL DEVELOPMENT**

Depth to Water:	18.23'	Well Diameter:	2"
Depth of Well:	27.90		
Height of Water Column:	9.67		
Water Column (gal):			
Gallons Purged:	2 GALS.		

**WATER SAMPLE COLLECTION DATA**

Method of Removal:	PUMP	Pump Time:	
Method of Sampling:	PUMP	Pump On:	0758
Time of Sampling:	0820	Pump Off:	0820

**FIELD ANALYSES**

	Well Vol. 1	Well Vol. 2	FINAL		
Temperature:	24.2	23.7	23.8		
pH:	8.08	7.85	7.80		
Specific Conductance:	84.0 ms/m	83.3	82.9		
Dissolved Oxygen:	4.54	3.08	2.77		
Redox Potential:	-169	-186	-179		
Gallons Purged	0	1.0	2.0		
NTU's	91.1	11.0	4.84		
Time:	0759	0805	0815		

Reason for Sampling: \_\_\_\_\_

Other (Specify): \_\_\_\_\_

Method of Shipment: HAND DELIVER

Physical Appearance: CLEAR W/NO ODOR

Type of Analysis:	VOC'S	SVOC'S	METALS	CN
Container Size and Type:	2@40ml	2@1liter	500ml	500ml
Preservative:	HCL	ICE	HNO3	NAOH

**REMARKS AND OBSERVATIONS**

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\_\_\_\_\_

\_\_\_\_\_

Site Location:	MACON, GA	 Williams Environmental Services, Inc. <small>A Subsidiary of Williams Group International, Inc.</small>
Date:	8/20/03	Project No. 11002990
		Well I.D. MW-2

# WATER QUALITY SAMPLING FORM

Client:	MACON II MGP	Project Number:	11002990
Sample Number:	MW-3 DUP082003	Date:	8/20/03
Sample Type:	GROUNDWATER	Time:	
Sampled By:	PNR	Weather:	SUNNY 90°F

**WELL DEVELOPMENT**

Depth to Water:	22.00'	Well Diameter:	2"
Depth of Well:	30.30		
Height of Water Column:	8.3		
Water Column (gal):			
Gallons Purged:	2 GALS.		

**WATER SAMPLE COLLECTION DATA**

Method of Removal:	PUMP	Pump Time:	
Method of Sampling:	PUMP	Pump On:	1234
Time of Sampling:	1300	Pump Off:	1300

**FIELD ANALYSES**

	Well Vol. 1	Well Vol. 2	FINAL		
Temperature:	26.3	22.6	22.4		
pH:	6.70	6.81	6.84		
Specific Conductance:	.128 ms/m	.128	.128		
Dissolved Oxygen:	9.26	6.26	5.17		
Redox Potential:	-126	-132	-137		
Gallons Purged	0	1.0	2.0		
NTU's	35.8	6.97	3.44		
Time:	1235	1244	1253		

Reason for Sampling: \_\_\_\_\_

Other (Specify): \_\_\_\_\_

Method of Shipment: HAND DELIVER

Physical Appearance: CLEAR W/NO ODOR

Type of Analysis: VOC'S      SVOC'S      METALS      CN

Container Size and Type: 2@40ml      2@1liter      500ml      500ml

Preservative: HCL      ICE      HNO3      NAOH

**REMARKS AND OBSERVATIONS**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Site Location:	MACON, GA	 Williams Environmental Services, Inc. <small>A Subsidiary of Williams Group International, Inc.</small>
Date:	8/20/03	Project No. 11002990
		Well I.D. MW-3 DUP

# WATER QUALITY SAMPLING FORM

Client:	MACON II MGP	Project Number:	11002990
Sample Number:	MW-4	Date:	8/20/03
Sample Type:	GROUNDWATER	Time:	
Sampled By:	PNR	Weather:	SUNNY 91°F

**WELL DEVELOPMENT**

Depth to Water:	22.75'	Well Diameter:	2"
Depth of Well:	32.85		
Height of Water Column:	10.1		
Water Column (gal):			
Gallons Purged:	3 GALS.		

**WATER SAMPLE COLLECTION DATA**

Method of Removal:	PUMP	Pump Time:	_____
Method of Sampling:	PUMP	Pump On:	1347
Time of Sampling:	1415	Pump Off:	1415

**FIELD ANALYSES**

	Well Vol. 1	Well Vol. 2	Well Vol. 3	FINAL	
Temperature:	23.3	22.4	22.4	22.4	
pH:	7.55	7.51	7.56	7.55	
Specific Conductance:	.137 s/m	131	.129	128	
Dissolved Oxygen:	9.39	6.75	5.42	5.40	
Redox Potential:	-194	-191	-194	-195	
Gallons Purged	0	1.0	2.0	3.0	
NTU's	37.4	10.9	4.63	4.38	
Time:	1349	1356	1404	1411	

Reason for Sampling: \_\_\_\_\_

Other (Specify): \_\_\_\_\_

Method of Shipment: HAND DELIVER

Physical Appearance: CLEAR W/NO ODOR

Type of Analysis:	VOC'S	SVOC'S	METALS	CN
Container Size and Type:	2@40ml	2@1liter	500ml	500ml
Preservative:	HCL	ICE	HNO3	NAOH

**REMARKS AND OBSERVATIONS**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Site Location:	MACON, GA	 Williams Environmental Services, Inc. <small>A Subsidiary of Williams Group International, Inc.</small>
Date:	8/20/03	Project No.
		11002990
		Well I.D.
		MW-4

# WATER QUALITY SAMPLING FORM

Client:	MACON II MGP	Project Number:	11002990
Sample Number:	MW-5	Date:	8/20/03
Sample Type:	GROUNDWATER	Time:	
Sampled By:	PNR	Weather:	CLEAR 75°F

**WELL DEVELOPMENT**

Depth to Water:	19.17'	Well Diameter:	2"
Depth of Well:	30.20		
Height of Water Column:	11.03		
Water Column (gal):			
Gallons Purged:	8 GALS.		

**WATER SAMPLE COLLECTION DATA**

Method of Removal:	PUMP	Pump Time:	
Method of Sampling:	PUMP	Pump On:	0642
Time of Sampling:	0745	Pump Off:	0745

**FIELD ANALYSES**

	Well Vol. 1	Well Vol. 2	Well Vol. 3	Well Vol. 4	FINAL
Temperature:	23.3	22.6	22.6	22.6	22.6
pH:	7.71	7.78	7.80	7.82	7.82
Specific Conductance:	.103 s/m	.104	.103	.099	.099
Dissolved Oxygen:	6.56	3.96	3.47	3.29	3.27
Redox Potential:	-177	-223	-224	-224	-224
Gallons Purged	0	2.0	4.0	6.0	8.0
NTU's	22.8	19.3	15.8	10.4	4.46
Time:	0643	0704	0721	0732	0745

Reason for Sampling: \_\_\_\_\_

Other (Specify): \_\_\_\_\_

Method of Shipment: HAND DELIVER

Physical Appearance: CLEAR W/NO ODOR

Type of Analysis:	VOC'S	SVOC'S	METALS	CN
Container Size and Type:	2@40ml	2@1liter	500ml	500ml
Preservative:	HCL	ICE	HNO3	NAOH

**REMARKS AND OBSERVATIONS**

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Site Location:	MACON, GA	 Williams Environmental Services, Inc. <small>A Subsidiary of Williams Group International, Inc.</small>
Date:	8/20/03	Project No. 11002990
		Well I.D. MW-5

# WATER QUALITY SAMPLING FORM

Client:	MACON II MGP	Project Number:	11002990
Sample Number:	MW-6	Date:	8/21/03
Sample Type:	GROUNDWATER	Time:	
Sampled By:	PNR	Weather:	CLEAR 85°F

**WELL DEVELOPMENT**

Depth to Water:	35.28'	Well Diameter:	2"
Depth of Well:	50.20		
Height of Water Column:	14.92		
Water Column (gal):			
Gallons Purged:	3.0 GALS.		

**WATER SAMPLE COLLECTION DATA**

Method of Removal:	PUMP	Pump Time:	
Method of Sampling:	PUMP	Pump On:	0739
Time of Sampling:	0815	Pump Off:	0815

**FIELD ANALYSES**

	Well Vol. 1	Well Vol. 2	Well Vol. 3	FINAL	
Temperature:	23.0	22.0	22.0	22.1	
pH:	7.09	6.53	6.51	6.51	
Specific Conductance:	43.3 ms/m	42.9	42.7	42.6	
Dissolved Oxygen:	6.24	4.33	4.30	4.29	
Redox Potential:	-35	-32	-29	-27	
Gallons Purged	0	1.0	2.0	3.0	
NTU's	62.2	14.3	10.7	4.46	
Time:	0740	0748	0756	0805	

Reason for Sampling:				
Other (Specify):				
Method of Shipment:	HAND DELIVER			
Physical Appearance:	CLEAR W/NO ODOR			
Type of Analysis:	VOC'S	SVOC'S	METALS	CN
Container Size and Type:	2@40ml	2@1liter	500ml	500ml
Preservative:	HCL	ICE	HNO3	NAOH

**REMARKS AND OBSERVATIONS**

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Site Location: MACON, GA

Williams Environmental Services, Inc.  
A Subsidiary of Williams Group International, Inc.



Date:	Project No.	Well I.D.
8/21/03	11002990	MW-6

# WATER QUALITY SAMPLING FORM

Client:	MACON II MGP	Project Numb	11002990
Sample Number:	MW-7	Date:	8/21/03
Sample Type:	GROUNDWATER	Time:	
Sampled By:	PNR	Weather:	CLEAR 75°F

**WELL DEVELOPMENT**

Depth to Water:	21.45'	Well Diameter	2"
Depth of Well:	34.83		
Height of Water Column:	13.38		
Water Column (gal):			
Gallons Purged:	8.0 GALS.		

**WATER SAMPLE COLLECTION DATA**

Method of Removal:	PUMP	Pump Time:	
Method of Sampling:	PUMP	Pump On:	0538
Time of Sampling:	0650	Pump Off:	0650

**FIELD ANALYSES**

	Well Vol. 1	Well Vol. 2	Well Vol. 3	Well Vol. 4	FINAL
Temperature:	24.2	24.1	24.1	24.1	24.1
pH:	7.91	7.32	7.18	7.14	7.14
Specific Conductance:	84.9 ms/m	85.0	91.0	93.3	93.4
Dissolved Oxygen:	5.45	4.01	3.46	3.14	3.12
Redox Potential:	-168	-165	-156	-154	-154
Gallons Purged	0	2.0	4.0	6.0	8.0
NTU's	34.7	268	31.3	16.1	4.98
Time:	0538	0552	0608	0623	0646

Reason for Sampling:				
Other (Specify):				
Method of Shipment:	HAND DELIVER			
Physical Appearance:	CLEAR W/NO ODOR			
Type of Analysis:	VOC'S	SVOC'S	METALS	CN
Container Size and Type:	2@40ml	2@1liter	500ml	500ml
Preservative:	HCL	ICE	HNO3	NAOH

**REMARKS AND OBSERVATIONS**

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Site Location:	MACON, GA		
		Williams Environmental Services, Inc. A Subsidiary of Williams Group International, Inc.	
Date:	8/21/03	Project No.	11002990
		Well I.D.	MW-7

**APPENDIX M**  
**POTENTIAL RECEPTOR STUDY**

# SECTION 1

## INTRODUCTION

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The Hazardous Site Response Act (HSRA) Rules (GEPD, 2003) allow for the determination of Risk Reduction Standards (RRS) that are protective of human health and the environment. Regulated substances identified at a given site must be compared with appropriate RRS that are based on property use (i.e., residential or non-residential) and, when applicable, site specific conditions. The five types of RRS against which a site's compliance status may be evaluated are described below:

**Type 1** - standardized exposure assumptions for residential properties;

**Type 2** - site-specific exposure determinations for residential properties;

**Type 3** - standardized exposure assumptions for non-residential properties;

**Type 4** - site-specific exposure determinations for non-residential properties; and

**Type 5**- restricted exposure assumptions evolving from engineering and institutional controls, such as caps, slurry walls, fences, deed restrictions, etc., to minimize exposure on properties where it is not appropriate and/or practical to apply Types 1 through 4 RRS.

The Macon 2 former Manufactured Gas Plant (MGP) facility is located on a 2.5-acre parcel, southeast of Spring Street between Riverside Drive and the Ocmulgee River in Macon, Georgia. The property is currently owned by the City of Macon and is used by the City of Macon to house the Electrical Service Shop. Facilities at the property include a combined office/service shop, equipment storage area, a warehouse and an employee parking lot. The majority of the property is covered with asphalt.

The Macon Transit Authority Bus Garage is located to the south of the former MGP facility. A Burger King restaurant, an Exxon service station and a Pizza Hut restaurant are located to west of the former MGP facility. The Norfolk Southern Railroad abuts the property to the northeast. The Ocmulgee River is located approximately 250 feet east of the Macon 2 former MGP facility.

The derivation of RRS and an ecological receptor evaluation were performed for an area encompassed by Macon 2 former MGP facility as well as all properties potentially affected by former MGP operations. Henceforth this area will be called the Site. The results of the Compliance Status Investigation (CSI) conducted by Williams Environmental Services, Inc., from February through April, 2001 and August 2003, revealed the presence of 35 regulated substances in soils and/or groundwater beneath the Site. The maximum concentrations of regulated substances detected in soil and groundwater were compared with Types 1 through 4 RRS to determine Site compliance. All four types of RRS are potentially applicable for the Site because the former Macon 2 MGP facility is located or adjacent to areas zoned for commercial, industrial as well as residential use and the future use of these areas is expected to remain the same. Type 5 RRS were not considered for this Site.

## SECTION 2

# RISK REDUCTION STANDARDS

The following section presents methods used to calculate RRS for the constituents of interest (COIs) detected in soil and groundwater.

### 2.1 SOIL

The equations employed in calculating Types 1 through 4 RRS for COI detected in Site soils are presented below. The assumptions employed in derivation of each type of RRS are discussed in Sections 2.1.1 through 2.1.4.

#### Non-carcinogenic Effects:

$$C_{\text{soil}} = \frac{HI * BW * AT * 365 \text{ days/year}}{ED * EF * [(1/RfD_o * CF * IR) + (1/RfD_i * IR_a * (1/VF + 1/PEF))]}$$

#### Carcinogenic Effects:

$$C_{\text{soil}} = \frac{TR * BW * AT * 365 \text{ days/year}}{ED * EF * [CSF_o * CF * IR) + (CSF_i * IR_a * (1/VF + 1/PEF))]}$$

#### Where:

$C_{\text{soil}}$  = Concentration of a contaminant in soil (mg/kg)

HI = Hazard Index

BW = Body Weight (kg)

AT = Averaging Time, non-carcinogenic effects (years)

AT = Averaging Time, carcinogenic effects (years)

ED = Exposure Duration (years)

EF = Exposure Frequency (days/year)

$RfD_o$  = Oral Reference Dose (mg/kg-d)

CF = Conversion Factor (kg/mg)

IR = Ingestion Rate (mg/day)

$RfD_i$  = Inhalation Reference Dose (mg/kg-d)

$IR_a$  = Inhalation rate ( $m^3$ /day)

VF = Volatilization Factor ( $m^3$ /kg)

PEF = Particulate Emission Factor ( $m^3$ /kg)

$CSF_o$  = Oral Cancer Slope Factor (mg/kg-d)<sup>-1</sup>

$CSF_i$  = Inhalation Cancer Slope Factor (mg/kg-d)<sup>-1</sup>

#### 2.1.1 TYPE 1 RISK REDUCTION STANDARDS

Type 1 RRS (generic residential) for soil were developed for the Site in accordance with HSRA Rule 391-3-19-.07(6) by selecting the smallest concentration fitting the following criteria:

1. The highest value of:
  - (a) Soil concentrations that trigger notification requirements (Appendix I of HSRA Rules);
  - (b) 100-times the Type I groundwater criteria listed in Appendix III, Table 1 of the HSRA Rules; and
  - (c) Type 1 soil criteria listed in Appendix III, Table 2 of the HSRA Rules
2. The non-cancer effects RRS, as calculated by equation 7 from Part B of the Risk Assessment Guidance (RAGS)

- Part B; USEPA, 1991); and
3. The carcinogenic effects RRS as calculated by equation 6 from RAGS Part B.

The equations used to calculate Type 1 RRS concentrations for non-carcinogenic and carcinogenic effects (i.e., RAGS Part B equation 7 and equation 6, respectively; USEPA, 1991a) are presented in Section 2.1. Type 1 RRS concentrations are calculated based on residential adult exposure via incidental ingestion of soil and inhalation of particulates and volatile compounds. The default exposure parameters used to calculate Type 1 RRS were obtained from Table 3 of Appendix III of HSRA Rules (GEPD, 2003) and included the following: 70 kilograms (Kg) body weight for an adult, 30 years exposure duration, 350 days per year frequency of exposure and 114 mg/day for an incidental ingestion of soil. The inhalation rate for adult residential receptors used was 20 m<sup>3</sup>/day. The soil-to-air volatilization factors for volatile compounds were derived according to an equation presented in the footnote to Table 3, Appendix III of the HSRA Rules. Physical and chemical properties of the regulated substances required to derive the volatilization factor for each compound such as diffusivity in air (D<sub>i</sub>), Henry's Law Constant (H), and the organic partitioning coefficient (K<sub>oc</sub>) were obtained from widely cited USEPA sources and are presented in Table 1. The particulate emission factor of 4.63 x 10<sup>-9</sup> m<sup>3</sup>/Kg used in calculating fugitive dust emission for each compound was obtained from Appendix III of the HSRA Rules.

Toxicity values of regulated compounds [i.e., the cancer slope factors (CSFs), used to assess potential carcinogenic effects risks, and reference doses (RfDs), used to assess non-carcinogenic effects], are employed in the derivation of RRS. These toxicity values were primarily obtained from the United States Environmental Protection Agency (USEPA) Integrated Risk Information System (IRIS, 2001). When toxicity values were not available in IRIS, other sources of information were used. These include Health Effects Assessment Tables (USEPA, 1997) and the National Center for Environmental Assessment. These sources of toxicity data have been accepted by the GEPD in the past. Toxicity values used in derivation of RRS are presented in Table 2.

Table 3 presents a comparison of maximum detected concentrations of COIs in soil to Type 1 RRS. Eleven COIs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, arsenic, lead, mercury, and zinc) exceeded Type 1 RRS.

### 2.1.2 Type 2 Risk Reduction Standards

Residential exposure factors were used to calculate the Type 2 RRS for COIs detected in Site soils through incidental ingestion of soils and inhalation of volatile compounds and fugitive dust. Since the vicinity of the Site is inhabited by both adults and children, Type 2 RRS concentrations were calculated for each of these receptor populations separately and the lesser of the two values was taken as the Type 2 RRS. The exposure factors used to calculate Type 2 RRS included: 70 Kg body weight for an adult and 15 Kg for a child, 30 years exposure duration for an adult and 6 years for a child, and incidental soil ingestion rates of 100 mg/day for an adult and 200 mg/day for a child. The inhalation rate for adult residential receptors used was 20 m<sup>3</sup>/day and 15 m<sup>3</sup>/day for a child. It was also assumed that

residents would be at home 350 days per year. The equations used in the derivation of Type 2 RRS are presented in Section 2.1 and the Type 2 RRS for the 35 COI are presented in Table 4.

Type 2 RRS cannot be calculated for lead because toxicity values are not available for this metal. A better prediction of potential exposure for lead is obtained through determining blood lead levels of exposed populations. Sensitive populations include preschool-age children and fetuses. In children, a blood lead level of 10 micrograms per deciliter (ug/dL) has been identified as a level at which no adverse effects would be expected (Centers for Disease Prevention and Control, 1985).

The Type 2 RRS for lead in soil was determined to be 400 mg/Kg based on the concentration in soil that triggers a notification concentration under HSRA. A cleanup target level of 400 mg/Kg for lead was also established by the Office of Solid Waste and Emergency Response as presented in the "Interim Guidance on Establishing Soil Lead Cleanup Levels at RCRA Facilities" (USEPA, 1994a). A concentration of 400 mg/Kg lead in soil is also supported by the USEPA's Integrated Exposure Uptake Model for Lead in Children (IEUBK; USEPA, 1994b). The IEUBK predicts that 400 mg/Kg lead in soil would cause 6 year old child to have a probability of no greater than 5 percent of a blood lead level of 10 ug/dL assuming exposure to Site soil and groundwater and other media not necessarily related to the Site such as food and maternal milk.

The comparison of maximum detected soil concentrations of COIs with Type 2 RRS (Table 3) indicated that benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, arsenic and lead exceeded Type 2 RRS.

### 2.1.3 Type 3 Risk Reduction Standards

Compounds that exceeded Type 2 RRS for soil were evaluated for compliance with Type 3 RRS. Type 3 RRS (generic non-residential) for soil were developed for the Site by selecting the highest concentration among the following criteria:

1. Soil concentrations that trigger notification requirements (Appendix I of HSRA Rules);
2. 100-times the Type I groundwater criteria listed in Appendix II, Table 1 of the HSRA Rules;
3. For lead, 400 mg/kg
4. Type 1 soil criteria listed in Appendix III, Table 2 of the HSRA Rules; and
5. For constituents detected in the top two feet of soil (surface soil) the lower of:
  - (a) the non-cancer effects RRS as calculated by equation 7 from RAGS Part B; and
  - (b) The carcinogenic effects RRS as calculated by equation 6 from RAGS Part B.

Type 3 RRS concentrations for carcinogenic and non-carcinogenic effects were calculated based on the exposed commercial/industrial worker scenario. Default exposure parameters for non-residential exposures obtained from Table 3, Appendix III of the HSRA Rule were applied in these calculations. The exposure factors include the following; 70 Kg body weight, 25 years exposure duration, 250 days per year as frequency of exposure, incidental soil ingestion rate of 50 mg/day, and inhalation rate of 20 m<sup>3</sup>/day. It was also assumed that workers would be at work for 8 hours per day and 5

days per week

As indicated in Table 5, no COI detected in surface soils (i.e., soil depth interval of 0-2 feet bgs.) exceeded Type 3 RRS for surface soils. The maximum detected concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and lead in deep soils (i.e., soil depth interval greater than 2 feet) exceeded Type 3 RRS for deep soils.

#### **2.1.4 Type 4 Risk Reduction Standards**

Exposure factors for commercial land use were employed to derive RRS for surface soils. For soils deeper than 2 feet, RRS were derived based on a construction worker scenario. Since commercial and/or industrial use of the Site is anticipated to continue, industrial exposure scenario is a conservative assumption for the surface soils at the Site and provides an adequate level of protection for potentially exposed populations. In the future, construction or excavation might be performed at the Site, therefore, the RRSs developed for deep soils based on construction worker scenario are also appropriate. During construction and/or excavation activities, workers might potentially come to contact with contaminants in soils below ground surface. Type 4 RRS are presented in Table 6. The exposure parameters used for a commercial worker scenario are the same as those used for derivation of Type 3 RRS. Exposure parameters used in derivation of Type 4 RRSs for construction worker scenario differ in incidental ingestion of soil, 330 mg/day (USEPA, 2001), and duration of exposure, assumed to be 0.5 years based on best professional judgment that subsurface construction activities would not be expected to last more than a half a year. Therefore, construction workers would not likely be exposed to site COI in the subsurface soils greater than a 0.5 years.

The Type 4 RRS for lead in soil was calculated using the Georgia Adult Lead Model (GALM) that was finalized in November 1999. The GALM was based on USEPA's methodology for assessing risk associated with adult exposures to lead known as the "adult lead model" (USEPA, 1996). Like the adult lead model, the GALM is based on the protection of fetal blood levels. However, the GALM considers intakes from both soil and groundwater. The approach used by the GALM relates intake of lead from soil and groundwater to blood lead concentrations in women of child-bearing age who might spend considerable time at the Site (GEPD, 1998). Protection of the blood lead of a hypothetical fetus ensures that any other person working the site will be adequately protected. For the Macon 2 former MGP facility, the Type 4 RRS for lead was calculated using the GALM that employed parameters presented in the HSRA Rules. The site-specific input parameter is the concentration of lead detected in groundwater beneath the Site. The analytical groundwater data indicated that lead was not detected at the Site. Therefore, the detection limit (0.01 mg/L) was used as the lead groundwater concentration in the GALM. The equations employed in derivation of Type 4 RRS for lead are presented in Table 7. The derived Type 4 RRS for lead is 1,429 mg/kg and is the same for both receptors (i.e., commercial and construction worker).

The HSRA regulations indicate that in addition to being protective of human health, Type 4 RRSs for soil should not cause impacts to groundwater above Type 4 RRSs established for groundwater. For those COI which did not exceed

Type 3 soil RRS, the Type 4 soil RRS was defaulted to the Type 3 RRS. Most of the COI were in compliance with more restrictive RRSs. Therefore, leachability studies were performed for only those COI which exceeded Type 3 RRS for soil, and the Type 4 RRSs have been adjusted accordingly. Section 9.5.1.2 of the CSR discusses the leachability study.

Comparison of the maximum detected concentrations of COI in soils (Table 5) indicated that no COIs exceeded Type 4 RRS and, therefore, the Site is in compliance with Type 4 RRS.

## 2.2 GROUNDWATER

The equations employed in calculating Types 1 through 4 RRS for contaminants detected in Site groundwater are presented below. The assumptions used in derivation of each type of RRS are discussed in Sections 2.2.1 and 2.2.4.

### Non-carcinogenic Effects:

$$C_{\text{groundwater}} = \frac{HI * BW * AT * 365 \text{ days/year}}{ED * EF * [(1/RfD_o * IR_w) + (1/RfD_i * K * IR_a)]}$$

### Carcinogenic Effects:

$$C_{\text{groundwater}} = \frac{TR * BW * AT * 365 \text{ days/year}}{ED * EF * [CSF_o * IR_w + (CSF_i * K * IR_a)]}$$

### Where:

- $C_{\text{groundwater}}$  = Concentration of a contaminant in groundwater (mg/l)
- HI = Hazard Index
- BW = Body Weight (kg)
- AT = Averaging Time, non-carcinogenic effects (years)
- AT = Averaging Time, carcinogenic effects (years)
- ED = Exposure Duration (years)
- EF = Exposure Frequency (days/year)
- $RfD_o$  = Oral Reference Dose (mg/kg-d)
- $IR_w$  = Ingestion Rate (l/day)
- $RfD_i$  = Inhalation Reference Dose (mg/kg-d)
- $IR_a$  = Inhalation rate ( $m^3$ /day)
- K = Volatilization Factor (unitless)
- $CSF_o$  = Oral Cancer Slope Factor (mg/kg-d)<sup>-1</sup>
- $CSF_i$  = Inhalation Cancer Slope Factor (mg/kg-d)<sup>-1</sup>

### 2.2.1 Types 1 and 3 Risk Reduction Standards

Type 1 RRSs apply at any point where groundwater has been affected by a release. To be in compliance, concentrations of COI in groundwater shall not exceed concentrations given in Table 1 of Appendix III of the HSRA Rules or, for those substances not listed, the background or detection limit concentration. If two or more regulated

organic compounds are present in groundwater, their sum in a single sample shall not exceed 10 mg/L if the Table 1 value for each compound is less than 5 mg/L, or, where at least one compound has a Table 1 value greater than or equal to 5 mg/L, the sum of the concentrations shall not exceed the maximum Table 1 value for a detected compound plus 10 mg/L.

No COI were detected in groundwater beneath the Site at concentrations exceeding their respective Type 1 RRS (Table 8). Therefore, groundwater at the Site is in compliance with Type 1 RRSs.

### **2.2.2 Type 2 Risk Reduction Standards**

The groundwater Types 2 and 4 RRS concentrations for carcinogenic and non-carcinogenic effects were calculated using Equations 1 and 2, respectively from RAGS Part B. These equations are presented in Section 2.2. Residential exposure factors were used to calculate Type 2 RRSs for COI detected in groundwater. The Type 2 RRSs are based on potential residential exposure of both children and adult populations. The Type 2 RRSs take under account that groundwater might be used as a source of potable water. Accordingly, exposure through ingestion of groundwater and inhalation of volatile compounds are considered as potential exposure pathways. The exposure factors used to calculate Type 2 RRSs are obtained from Appendix III, Table 3 of the HSRA Rules. Water intake rates for adult and child were assumed to be 2 L/day and 1 L/day, respectively. The remaining exposure factors (i.e., body weight of adult and child receptor, exposure frequency and duration of exposure etc.) were the same as the ones used to calculate residential (Type 2) RRS for soil.

RAGS Equations 1 and 2 include a default water-air volatilization factor of 0.5 L/m<sup>3</sup> for compounds that easily evaporate from water. Based on RAGS Part B this volatilization factor is only applicable to chemicals with Henry's Law constant of greater than  $1 \times 10^{-5}$  atm-m<sup>3</sup>/mole. Accordingly, the volatilization potential for compounds that did not meet these criteria were not included in the derivation of groundwater RRSs.

Type 2 RRS are presented in Table 9. Comparison of maximum detected concentrations of COI in groundwater with Type 2 RRS indicate that no COI were detected in groundwater exceeding a Type 2 RRS (Table 8).

### **2.2.3 Type 3 Risk Reduction Standards**

The Type 3 RRS criteria for groundwater are the same as the Type 1 RRS (see Section 2.2.1). As indicated in Table 10, concentrations of COI in groundwater are below the Type 3 RRSs.

### **2.2.4 Type 4 Risk Reduction Standards**

Non-residential exposure factors based on a commercial worker scenario were used to calculate Type 4 RRS concentrations for COIs detected in groundwater beneath the Site. Under the commercial worker scenario it was assumed that persons working at the Site might be exposed to groundwater through ingestion of 1 liter of water per day and through inhalation of volatile compounds. All the other exposure intakes such are the same as those used for

calculation of Types 4 RRS for soil. Derived Type 4 RRSs for COI are presented in Table 11. No COI detected in groundwater exceeded Type 4 RRSs for groundwater (Table 10).

## SECTION 3

# ECOLOGICAL RECEPTORS EVALUATION

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The following section identifies ecological receptors likely to be present at the Site and its vicinity and evaluates potential pathways whereby local fauna and flora might be exposed to contaminants detected in Site soils and groundwater.

### 3.1 ECOLOGICAL SETTING

The former Macon 2 MGP facility is located in an area developed largely for industrial and commercial use. Due to its location and use, there are no suitable (natural) ecological habitats at the Site. The Site is comprised of buildings and open areas mostly covered by asphalt and/or concrete. The Site is located approximately 250 feet from the Ocmulgee River. The stretch of Ocmulgee River that lies adjacent to the former Macon 2 MGP facility is located in the industrial area. The banks of the river are densely vegetated by shrubs, grasses and mixed hardwood and pine trees. Bottomland hardwood habitats are limited to a narrow strip of land along the river banks due to proximity of urban and industrial/commercial areas. Trees commonly observed in areas adjacent to the site include loblolly-shortleaf pine, oak, hickory, sweet gum, yellow poplar, elm, maple and white ash. The plants sighted in the area include wild black cherry, passion flower, Catesby's trillium and mountain laurel. Reptiles commonly found in this part of Georgia include timber rattlesnakes, kingsnakes, cottonmouth, copperhead, and the black rat snakes and these may be present in this area. Common birds found in this area include red-tailed hawk, northern bobwhite, summer tanager, blue jay, downy woodpecker, dove, wood duck and snowy egret. Small wildlife such as grey squirrels, opossums and chipmunks are expected to inhabit this area. This area is also a suitable habitat for white-tailed deer, raccoons and cottontail rabbits.

The Ocmulgee River at Macon passes through the downtown area and is approximately 280 feet wide. The river provides habitat for a variety of aquatic species such as striped bass, largemouth bass, catfish, common carp and black and white crappie as well as a variety of mussels.

### 3.2 THREATENED AND ENDANGERED SPECIES

Based on information obtained from the Georgia Natural Heritage, and the U.S. Fish and Wildlife databases, several federal endangered and threatened plant and animal species are listed (Table 12) for Bibb County and adjacent counties (Crawford, Houston, Jones, Monroe, Peach and Twiggs) and may, therefore, potentially inhabit this area. The endangered and threatened animal species include bald eagle, (*Haliaeetus leucocephalus*), wood stork (*Mycteria americana*), red-cockaded woodpecker (*Picoides borealis*), Eastern indigo snake (*Drymarchon corais couperi*), Barbour's map turtle (*Graptemys barbouri*), alligator snapping turtle (*Macrolemys temmincki*) and gopher tortoise (*Gopherus polyphemus*). The endangered and threatened plant species include sweet pitcher-plant (*Sarracenia rubra*), fringed campion (*Silene polypetala*), Shoals spider-lily (*Hymenocallis coronaria*), Ocmulgee skullcap (*Scutellaria ocmulgee*), green pitcher-plant (*Sarracenia rubra*), Indian olive (*Nestronia umbellula*) and relict trillium (*Trillium reliquum*). Aquatic species listed as threatened and endangered species that may inhabit the stretch of Ocmulgee River

adjacent to the Site include bluestripe shiner (*Cyprinella callitaenia*), purple bankclimber mussel (*Elliptoideus sloatianus*), shiny-rayed pocketbook mussel (*Lampsilis subangulata*), Gulf moccasinshell mussel (*Medionidus pencillatus*) and oval pigtoe mussel (*Pleurobema pyriforme*).

### 3.3 POTENTIAL EXPOSURE

The potential for exposure of ecological species to contaminants detected in soil and groundwater at the Site is low. Terrestrial wildlife is not likely to enter the Site because the Site is covered by buildings and pavement and therefore does not provide a suitable habitat for wildlife. The Ocmulgee River and areas adjacent to the River present a suitable habitat for aquatic birds, fish and terrestrial wildlife. These receptors could potentially be exposed to contaminants in surface soils through ingestion of soil, dermal contact and inhalation of fugitive dust. However, ecological receptors are not likely to be affected by contaminants detected in the Site soils because the Site is currently paved and, therefore, there are no mechanisms for transport of soil contaminants (i.e., via surface water runoff or through fugitive emissions) from the Site. Contaminants detected in groundwater beneath the Site might potentially discharge to surface waters in Ocmulgee River. However, the impact on Ocmulgee River is expected to be low because all of the COIs detected in groundwater are below Type 1 RRS (see Section 2.2). In addition, the extent of COI in groundwater has been delineated to background levels and does not extend to the river.

## SECTION 4 REFERENCES

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U.S. Environmental Protection Agency (USEPA), 1994b. Guidance Manual for the Integrated Exposure Uptake Biokinetic Model. OSWER Directive #9285.7-15.1, BB93-963510, February 1994.

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**TABLE 1**  
**PHYSICAL AND CHEMICAL PROPERTIES OF CONSTITUENTS OF INTEREST**  
 Former Macon 2 Manufactured Gas Plant Facility  
 Macon, Georgia

Parameter	Di (cm <sup>2</sup> /sec)	H (atm-m <sup>3</sup> /mol)	Koc (cm <sup>3</sup> /g)	VF (m <sup>3</sup> /kg)
<b>VOCs</b>				
Benzene	0.088	5.60E-03	55.1	2.76E+03
Carbon Disulfide	0.104	3.00E-02	66.2	1.12E+03
Ethylbenzene	0.075	7.88E-03	341	6.36E+03
Methylene Chloride	1.01E-01	2.20E-03	12.80	1.95E+03
Toluene	0.087	6.60E-03	165	4.47E+03
Xylenes	0.0769	7.30E-03	341	6.53E+03
<b>Semi-VOCs</b>				
Acenaphthene	0.0421	1.60E-04	6820	2.68E+05
Acenaphthylene	0.06703	1.10E-04	10700	3.21E+05
Anthracene	0.0324	6.50E-05	26500	9.44E+05
Fluorene	0.0363	6.40E-05	13500	6.42E+05
Naphthalene	0.059	4.80E-04	1780	6.64E+04
Phenanthrene	0.0543	2.56E-05	26500	1.16E+08

Superfund Chemical Data Marix, EPA, 1996.

**Derivation Of VF Values (Soil-to-Air Volatilization Factor):**

$$VF(m^3/kg) = \frac{(LS \times V \times DH)}{A} \times \frac{(\pi \times \alpha \times T)^{1/2}}{(2 \times D_{ei} \times E \times K_{oc} \times 10^{-3} \text{ kg/g})}$$

where:

LS = length of side of contaminated area (m):	45
V = wind speed in mixing zone (m/s):	2.25
DH = diffusion height (m):	2
A = area of contamination (cm <sup>2</sup> ):	2.03E+07
π = pi:	3.1415927
α = (cm <sup>2</sup> /s):	(D <sub>ei</sub> × E)/(E + (ρ <sub>s</sub> × ((1-E)/K <sub>oc</sub> )))
T = exposure interval (s), industrial:	7.88E+08
ρ <sub>s</sub> = density of soil solids (g/cm <sup>3</sup> ):	2.65
OC = soil organic carbon content fraction (unitless):	0.02
D <sub>ei</sub> = effective diffusivity (cm <sup>2</sup> /s):	D <sub>i</sub> × E <sup>0.33</sup>
D <sub>i</sub> = molecular diffusivity (cm <sup>2</sup> /s):	chemical-specific
E = total soil porosity (unitless):	0.35
K <sub>oc</sub> = soil/air partition coefficient (g soil/cm <sup>3</sup> air):	(H/K <sub>d</sub> ) × 41
H = Henry's law constant (atm-m <sup>3</sup> /mol):	chemical-specific
K <sub>d</sub> = soil-water partition coefficient (cm <sup>3</sup> /g):	K <sub>oc</sub> × OC
K <sub>oc</sub> = organic carbon partition coefficient (cm <sup>3</sup> /g):	chemical-specific

m = meter

s = second

cm = centimeter

g = gram

atm-m<sup>3</sup>/mol = atmospheres-cubic meters per mole

**TABLE 2**  
**CANCER SLOPE FACTORS AND REFERENCE DOSES FOR CONSTITUENTS OF INTEREST**  
**Former Macon 2 Manufactured Gas Plant Facility**  
**Macon, Georgia**

Parameter	RfD <sub>o</sub> (mg/kg-d)		RfD <sub>i</sub> (mg/kg-d)		CSF <sub>o</sub> (mg/kg-d) <sup>-1</sup>		CSF <sub>i</sub> (mg/kg-d) <sup>-1</sup>	
<b>VOCs</b>								
Benzene	4.00E-03	a	8.60E-03	a	5.50E-02	a	2.73E-02	a
Carbon Disulfide	1.00E-01	a	2.00E-01	a	NA		NA	
Ethylbenzene	1.00E-01	a	2.90E-01	a	NA		3.90E-03	e
Methylene Chloride	6.00E-02	a	8.60E-01	b	7.50E-03	a	1.65E-03	a
Methyl-tert-butyl-ether	NA		8.57E-01	a	NA		NA	
Toluene	2.00E-01	a	1.14E-01	a	NA		NA	
Xylenes	2.00E+00	a	3.00E-03	a	NA		NA	
<b>SVOCs</b>								
Acenaphthene	6.00E-02	a	NA		NA		NA	
Acenaphthylene	3.00E-03	c	NA		NA		NA	
Anthracene	3.00E-01	a	NA		NA		NA	
Benzo(a)anthracene	NA		NA		7.30E-01	d	3.10E-01	d
Benzo(a)pyrene	NA		NA		7.30E+00	a	3.10E+00	g
Benzo(b)fluoranthene	NA		NA		7.30E-01	d	3.10E-01	d
Benzo(g,h,i)perylene	3.00E-02	e	NA		NA		NA	
Benzo(k)fluoranthene	NA		NA		7.30E-02	d	3.10E-02	d
Chrysene	NA		NA		7.30E-03	d	3.10E-03	d
Dibenzo(a,h)anthracene	NA		NA		7.30E+00	d	3.10E+00	d
Fluoranthene	4.00E-02	a	NA		NA		NA	
Fluorene	4.00E-02	a	NA		NA		NA	
Indeno(1,2,3-cd)pyrene	NA		NA		7.30E-01	d	3.10E-01	d
Naphthalene	2.00E-02	a	9.00E-04	a	NA		NA	
Phenanthrene	3.00E-02	c	NA		NA		NA	
Phenol	6.00E-01	a	NA		NA		NA	
Pyrene	3.00E-02	a	NA		NA		NA	
<b>Inorganics</b>								
Arsenic	3.00E-04	a	NA		1.50E+00	a	1.51E+01	a
Barium	7.00E-02	a	1.40E-04	b	NA		NA	
Beryllium	2.00E-03	a	5.70E-06	a	NA		8.40E+00	a
Cadmium	1.00E-03	a, f	5.70E-05	e	NA		6.30E+00	a
Chromium	3.00E-03	a	3.00E-05	a	NA		4.10E+01	b
Copper	4.00E-02	b	NA		NA		NA	
Cyanide	2.00E-02	a	NA		NA		NA	
Lead	NA		NA		NA		NA	
Mercury	3.00E-04	a	8.60E-05	a	NA		NA	
Nickel	2.00E-02	a	NA		NA		NA	a
Vanadium	7.00E-03	b	NA		NA		NA	
Zinc	3.00E-01	a	NA		NA		NA	

(a) IRIS (2003)

(b) HEAST(7/97)

(c) Pyrene used as surrogate

(d) Toxicity Equivalence Factor (TEF) relative to benzo(a)pyrene were obtained from:  
 USEPA Region IV Office of Technical Services Supplemental Guidance to RAGS; October, 1996.

(e) EPA-NCEA

(f) Value based on exposure to cadmium through food intake; RfD for cadmium-water is 5E-04 mg/kg-day  
 NA = Not available or not applicable

**TABLE 3**  
**COMPARISON OF MAXIMUM CONCENTRATIONS DETECTED IN SOIL**  
**TO TYPES 1 AND 2 RISK REDUCTION STANDARDS**  
**Former Macon 2 Manufactured Gas Plant Facility**  
**Macon, Georgia**

Parameter	Max. Conc. Above Water Table (mg/kg)	Type 1 RRS (mg/kg)	Source of Type 1 Standard	Type 2 RRS (mg/kg)	Source of Type 2 Standard
<b>VOCs</b>					
Benzene	0.031	0.500	b	8.37	d
Carbon Disulfide	0.032	400	b	228	f
Ethylbenzene	ND	70.0	b	139	f
Methylene Chloride	ND	0.500	b	96.5	d
Toluene	0.010	100	b	514	f
Xylenes	0.0055	1,000	b	1,000	f
<b>SVOCs</b>					
Acenaphthene	6.1	300	a	4,690	f
Acenaphthylene	8.8	130	a	2,350	f
Anthracene	33	500	a	23,500	f
Benzo(a)anthracene	37	5.00	a	12.5	d
Benzo(a)pyrene	26	1.64	a	1.25	d
Benzo(b)fluoranthene	27	5.00	a	12.5	d
Benzo(g,h,i)perylene	5.0	500	a	2,350	f
Benzo(k)fluoranthene	28	5.00	a	125	d
Chrysene	37	5.00	a	1,250	d
Dibenzo(a,h)anthracene	3.5	2.00	d	1.25	d
Fluoranthene	68	500	a	3,130	f
Fluorene	31	360	a	3,130	f
Indeno(1,2,3-cd)pyrene	15	5.00	a	12.5	d
Naphthalene	51	100	a	59.9	f
Phenanthrene	110	110	a	2,350	f
Phenol	ND	400	b	46,900	f
Pyrene	70	500	a	2,350	f
<b>Inorganics</b>					
Arsenic	31.5	20.0	c	6.08	d
Barium	279	1,000	c	5,430	f
Beryllium	ND	2.00	c	156	f
Cadmium	ND	2.00	c	78.2	f
Chromium	46.3	100	c	234	f
Copper	89.1	100	c	3,130	f
Cyanide	1.44	20.0	b	1,560	f
Lead	634	75.0/204	c/e	400	*
Mercury	9.43	0.500/0.540	c/e	23.5	f
Nickel	14.4	50.0	c	1,560	f
Vanadium	79.3	100/120	c/g	548	f
Zinc	544	100/257	c/e	23,500	f

Blocked values exceed Risk Reduction Standards

\* = Derived based on the EPA Integrated Exposure Biokinetic Model.

a = Appendix I Notification Requirement (GEPD, 1999)

b = Appendix III Table 1 times 100 (GEPD, 1999)

c = Appendix III Table 2 (GEPD, 1999)

d = Upperbound excess cancer risk

e = Background in fill material

f = Noncarcinogenic risk

g = Background in natural soils

NA = Not available

**TABLE 4**  
**TYPE 2 RISK REDUCTION STANDARDS FOR**  
**POTENTIAL RESIDENTIAL (ADULT AND CHILD) EXPOSURE TO SOIL**  
**Former Macon 2 Manufactured Gas Plant Facility**  
**Macon, Georgia**

Parameter	Calculated	Calculated	Calculated	Calculated	Type 2 RRSs (mg/kg)
	Goal Child (Nonc) (mg/kg)	Goal Child (Carc) (mg/kg)	Goal Adult (Nonc) (mg/kg)	Goal Adult (Carc) (mg/kg)	
<b><u>VOCs</u></b>					
Benzene	22.91	11.44	84.04	8.368	8.37
Carbon Disulfide	227.7	NA	811.8	NA	228
Ethylbenzene	1,544	199	6,166	139	139
Methylene Chloride	1,275	128.7	5,374	96.45	96.5
Toluene	514.5	NA	1,839	NA	514
Xylenes	156,429	NA	1,460,000	NA	156,429
<b><u>SVOCs</u></b>					
Acenaphthene	4,693	NA	43,800	NA	4,693
Acenaphthylene	2,346	NA	21,900	NA	2,346
Anthracene	23,464	NA	219,000	NA	23,464
Benzo(a)anthracene	NA	12.50	NA	23.33	12.5
Benzo(a)pyrene	NA	1.250	NA	2.333	1.25
Benzo(b)fluoranthene	NA	12.50	NA	23.33	12.5
Benzo(g,h,i)perylene	2,346	NA	21,900	NA	2,346
Benzo(k)fluoranthene	NA	125.0	NA	233	125
Chrysene	NA	1,250	NA	2,333	1,250
Dibenzo(a,h)anthracene	NA	1,250	NA	2,333	1.25
Fluoranthene	3,129	NA	29,200	NA	3,129
Fluorene	3,129	NA	29,200	NA	3,129
Indeno(1,2,3-cd)pyrene	NA	12.50	NA	23.33	12.5
Naphthalene	59.9	NA	214.8	NA	59.9
Phenanthrene	2,346	NA	21,900	NA	2,346
Phenol	46,929	NA	438,000	NA	46,929
Pyrene	2,346	NA	21,900	NA	2,346
<b><u>Inorganics</u></b>					
Arsenic	23.46	6.082	219.0	11.35	6.08
Barium	5,431	NA	50,020	NA	5,431
Beryllium	155.5	67,056	1,438	46,939	156
Cadmium	78.19	89,408	729.4	62,586	78.2
Chromium	234.3	13,738	2,181	9,617	234
Copper	3,129	NA	29,200	NA	3,129
Cyanide	1,564	NA	14,600	NA	1,564
Lead	NA	NA	NA	NA	400
Mercury	23.46	NA	218.9670	NA	23.5
Nickel	1,564	NA	14,600	NA	1,564
Vanadium	548	NA	5,110	NA	548
Zinc	23,464	NA	219,000	NA	23,464

NA = Not available

\* = Derived based on the EPA Integrated Exposure Biokinetic Model.

TABLE 4  
 TYPE 2 RISK REDUCTION STANDARDS FOR  
 POTENTIAL RESIDENTIAL (ADULT AND CHILD) EXPOSURE TO SOIL  
 Former Macon 2 Manufactured Gas Plant Facility  
 Macon, Georgia

Noncarcinogens:

$$C = \frac{HI \cdot BW \cdot AT \cdot 365 \text{ days/year}}{EF \cdot ED \left[ \left( \frac{1}{RfD_o} \cdot IR \cdot CF + \left( \frac{1}{RfD_i} \cdot IR_a \cdot \left( \frac{1}{VF} + 1 \right) / PEF \right) \right) \right]}$$

Carcinogens:

$$C = \frac{TR \cdot BW \cdot AT \cdot 365 \text{ days/year}}{EF \cdot ED \left[ \left( CSF_o \cdot IR \cdot CF + \left( CSF_i \cdot IR_a \cdot \left( \frac{1}{VF} + 1 \right) / PEF \right) \right) \right]}$$

where:

HI (Hazard Index)	1
BW = Body Weight (kg), adult	70
BW = Body Weight (kg), child	15
AT = Averaging Time (years), child	6
AT = Averaging Time (years), (carc)	70
EF = Exposure Frequency (days/year)	350
ED = Exposure Duration (years), adult	30
ED = Exposure Duration (years), child	6
RfD <sub>o</sub> = Oral Reference Dose	Chemical-specific
RfD <sub>i</sub> = Inhalation Reference Dose	Chemical-specific
IR = Ingestion Rate (mg/day), child	200
IR = Ingestion Rate (mg/day), adult	100
TR = Target Risk	1.00E-05
CSF <sub>o</sub> = Oral Cancer Slope Factor	Chemical-specific
CSF <sub>i</sub> = Inhalation Cancer Slope Factor	Chemical-specific
IR <sub>a</sub> = Air Inhalation Rate (child) (m <sup>3</sup> /day)	15
IR <sub>a</sub> = Air Inhalation Rate (Adult) (m <sup>3</sup> /day)	15
1/PEF = Inv of Particulate Emission Factor (kg/m <sup>3</sup> )	2.16E-10
CF = Conversion Factor (kg/mg)	1.00E-06
VF = Volatilization Factor (m <sup>3</sup> /kg)	Chemical-specific

**TABLE 5**  
**COMPARISON OF MAXIMUM CONCENTRATIONS DETECTED IN SOIL**  
**TO TYPES 3 AND 4 RISK REDUCTION STANDARDS**  
**Former Macon 2 Manufactured Gas Plant Facility**  
**Macon, Georgia**

Parameter	Max. Conc.		Type 3 RRS	Type 3 RRS	Source of Type 3 Standard	Type 4 RRS	Type 4 RRS	Source of Type 4 Standard
	Above Water Table (mg/kg) 0-2'	Above Water Table (mg/kg) >2'	(mg/kg) 0-2'	(mg/kg) >2'		(mg/kg) 0-2'	(mg/kg) >2'	
<b>VOCs</b>								
Benzene	ND	0.031	0.500	0.500	b	0.500	0.500	e
Carbon Disulfide	ND	0.032	400	400	b	400	400	e
Ethylbenzene	ND	ND	70.0	70.0	b	70.0	70.0	e
Methylene Chloride	ND	ND	0.500	0.500	b	0.500	0.500	e
Toluene	ND	0.010	100	100	b	100	100	e
Xylenes	ND	0.0055	1,000	1,000	b	1,000	1,000	e
<b>SVOCs</b>								
Acenaphthene	ND	6.1	300	300	a	300	300	e
Acenaphthylene	ND	8.8	130	130	a	130	130	e
Anthracene	ND	33	500	500	a	500	500	e
Benzo(a)anthracene	0.75	37	5.00	5.00	a	78.4	120	d/f
Benzo(a)pyrene	0.74	26	1.64	1.64	a	7.84	63.3	d/f
Benzo(b)fluoranthene	0.69	27	5.00	5.00	a	78.4	298	d/f
Benzo(g,h,i)perylene	0.540	5.0	500	500	a	500	500	e
Benzo(k)fluoranthene	0.780	28	5.00	5.00	a	5.00	5.00	e
Chrysene	0.77	37	5.00	5.00	a	5.00	5.00	e
Dibenzo(a,h)anthracene	ND	3.5	5.00	5.00	a	5.00	5.00	e
Fluoranthene	1.5	68	500	500	a	500	500	e
Fluorene	ND	31	360	360	a	360	360	e
Indeno(1,2,3-cd)pyrene	0.38	15	5.00	5.00	a	78.4	924	d/f
Naphthalene	DL	51	100	100	a	100	100	e
Phenanthrene	1.1	110	110	110	a	110	110	e
Phenol	ND	ND	400	400	b	400	400	e
Pyrene	1.1	70	500	500	a	500	500	e
<b>Inorganics</b>								
Arsenic	31.6	7.47	38.1	41.0	d,a	38.1	41.0	e
Barium	119	279	1,000	1,000	c	1,000	1,000	e
Beryllium	ND	ND	3.00	3.00	a	3.00	3.00	e
Cadmium	ND	ND	39.0	39.0	a	39.0	39.0	e
Chromium	25.0	46.3	1,200	1,200	a	1,200	1,200	e
Copper	63.7	89.1	1,500	1,500	a	1,500	1,500	e
Cyanide	ND	1.44	20.0	20.0	b	20.0	20.0	e
Lead	151	634	400	400	a	1,070	1,070	f
Mercury	0.825	9.43	17.0	17.0	a	17.0	17.0	e
Nickel	8.29	14.4	420	420	a	420	420	e
Vanadium	75.3	79.3	100	100	a	100	100	e
Zinc	160	544	2,800	2,800	a	2,800	2,800	e

ND = Non detect

Blocked values exceed Risk Reduction Standards

a = Appendix I Notification Requirement (GEPD, 1999)

b = Appendix III Table 1 times 100 (GEPD, 1999)

c = Appendix III Table 2 (GEPD, 1999)

d = Upperbound excess cancer risk

e = Calculated Type 4 RRS by RAGs was not evaluated for leachability; therefore, defaults to Type 3.

f = Concentration protective of groundwater is less than Type 4 RRS calculated by RAGs, therefore, Type 4 has been adjusted to be protective of groundwater

NA = Not available

**TABLE 6**  
**TYPE 4 RISK REDUCTION STANDARDS FOR**  
**POTENTIAL COMMERCIAL AND CONSTRUCTION EXPOSURE TO SOIL**  
**Former Macon 2 Manufactured Gas Plant Facility**  
**Macon, Georgia**

Parameter	Commercial Worker			Construction Worker		
	Calculated Goal (Nonc) (mg/kg)	Calculated Goal (Carc) (mg/kg)	Type 4 RRSs (mg/kg) 0-2'	Calculated Goal (Noncar) (mg/kg)	Calculated Goal (Car) (mg/kg)	Type 4 RRS (mg/kg) >2'
<b>VOCs</b>						
Benzene	119.4	14.25	14.25	220.7	1,324	220.7
Carbon Disulfide	1,143	NA	1,143	2,216	NA	2,216
Ethylbenzene	9,013	233.4	233.4	14,457	23,344	14,457
Methylene Chloride	8,016	165.6	165.6	11,736	14,762	11,736
Toluene	2,590	NA	2,590	5,003	NA	5,003
Xylenes	4,088,000	NA	4,088,000	1,238,788	NA	1,238,788
<b>SVOCs</b>						
Acenaphthene	122,640	NA	122,640	37,164	NA	37,164
Acenaphthylene	6,132	NA	6,132	1,858	NA	1,858
Anthracene	613,200	NA	613,200	185,818	NA	185,818
Benzo(a)anthracene	NA	78.4	78.40	NA	1,188	1,188
Benzo(a)pyrene	NA	7.84	7.840	NA	118.8	118.8
Benzo(b)fluoranthene	NA	78.4	78.40	NA	1,188	1,188
Benzo(g,h,i)perylene	61,320	NA	61,320	18,582	NA	18,582
Benzo(k)fluoranthene	NA	784	784.0	NA	11,879	11,879
Chrysene	NA	7,840	7,840	NA	118,787	118,787
Dibenzo(a,h)anthracene	NA	7.84	7.840	NA	118.8	118.8
Fluoranthene	81,760	NA	81,760	24,776	NA	24,776
Fluorene	81,760	NA	81,760	24,776	NA	24,776
Indeno(1,2,3-cd)pyrene	NA	78.4	78.40	NA	1,188	1,188
Naphthalene	303	NA	302.9	581.6	NA	582
Phenanthrene	61,320	NA	61,320	18,582	NA	18,582
Phenol	1,228,400	NA	1,228,400	371,636	NA	371,636
Pyrene	61,320	NA	61,320	18,582	NA	18,582
<b>Inorganics</b>						
Arsenic	613.2	38.12	38.12	185.8	578.0	186
Barium	137,155	NA	137,155	43,076	NA	43,076
Beryllium	3,968	78,858	3,968	1,233	112,654	1,233
Cadmium	2,041	105,144	2,041	619.3	10,514,403	619
Chromium	6,079	18,156	6,079	1,856	11,540	1,856
Copper	81,760	NA	81,760	24,776	NA	24,776
Cyanide	40,880	NA	40,880	12,388	NA	12,388
Lead	NA	NA	1,429	NA	NA	1,429
Mercury	613.0	NA	613.0	185.8	NA	186
Nickel	40,880	NA	40,880	12,388	NA	12,388
Vanadium	14,308	NA	14,308	4,336	NA	4,336
Zinc	613,200	NA	613,200	185,818	NA	185,818

\* = Type 4 RRS > 1.00E+08, therefore it defaults to Type 3 RRS.

\*\* = Calculated based on Georgia Adult Lead Model (see Table 7)

NA = Not available

TABLE 6  
 TYPE 4 RISK REDUCTION STANDARDS FOR  
 POTENTIAL COMMERCIAL AND CONSTRUCTION EXPOSURE TO SOIL  
 Former Macon 2 Manufactured Gas Plant Facility  
 Macon, Georgia

Noncarcinogens:

$$C = \frac{HI \cdot BW \cdot AT \cdot 365 \text{ days/year}}{EF \cdot ED \cdot \left[ \frac{1}{RfD_o} \cdot CF \cdot IR \right] + \left[ \frac{1}{RfD_i} \cdot IR_a \cdot \left( \frac{1}{VF} + 1/PEF \right) \right]}$$

Carcinogens:

$$C = \frac{TR \cdot BW \cdot AT \cdot 365 \text{ days/year}}{EF \cdot ED \cdot \left[ (CSF_o \cdot IR \cdot CF) + (CSF_i \cdot IR_a \cdot \left( \frac{1}{VF} + 1/PEF \right)) \right]}$$

where:

	Commercial Worker	Construction Worker
HI (Hazard Index)	1	1
BW = Body Weight (kg), adult	70	70
AT = Averaging Time (years), (adult/carc)	70	70
AT = Averaging Time (years), (adult/nonc)	25	0.5
EF = Exposure Frequency (days/year)	250	125
ED = Exposure Duration (years), adult/carc	25	0.5
RfD <sub>o</sub> = Oral Reference Dose	Chemical-specific	Chemical-specific
RfD <sub>i</sub> = Inhalation Reference Dose	Chemical-specific	Chemical-specific
CSF <sub>o</sub> = Oral Cancer Slope Factor	Chemical-specific	Chemical-specific
CSF <sub>i</sub> = Inhalation Cancer Slope Factor	Chemical-specific	Chemical-specific
IR = Ingestion Rate (mg/day), adult	50	330
TR = Target Risk	1.00E-05	1.00E-05
IR <sub>a</sub> = Air Inhalation Rate (adult)	20	20
1/PEF = Inv of Particulate Emission Factor (kg/m <sup>3</sup> )	2.16E-10	2.16E-10
CF = Conversion Factor (kg/mg)	1.00E-06	1.00E-06
VF = Volatilization Factor (m <sup>3</sup> /kg)	Chemical-specific	Chemical-specific

TABLE 7  
 CALCULATION OF TYPE 4 RISK REDUCTION STANDARDS FOR LEAD IN SOIL  
 Former Macon 2 Manufactured Gas Facility  
 Macon, Georgia

Definitions	Units	Values	Comments
Baseline blood lead concentration in adults	ug/dL	1.38	
The blood lead goal for the unborn fetus	ug/dL	10	
The average blood lead goal for adult	ug/dL	3.44	Calculated from equation 1 (see below)
Geometric standard deviation of blood lead concentration	unitless	2.04	
Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration	unitless	0.9	
Biokinetic slope factor	ug/dL per ug/day	0.4	
Exposure frequency	days/year	219	
Averaging time	days/year	365	
Intake rate of soil	g/day	0.05	
Absolute GI absorption factor for ingested lead in soil and in dust	unitless	0.12	
Concentration of lead in groundwater at site	ug/L	0.01	Detection Limit
Intake rate of water	L/day	1	
Absolute GI absorption factor for lead ingested in groundwater	unitless	0.2	
Risk Reduction Standard - soil lead concentrations	mg/kg	1429.44	Calculated from equation 2 (see below)

Model, HSRA Appendix IV, October 27, 1999.

$$PbB = \frac{PbB_{fetal}}{R^*GSD^{1.645}}$$

$$R^*GSD^{1.645}$$

$$RRS = \frac{[(PbB - PbB_{fetal}) - (C_w * I_w * A_w)] * (I_s * A_s)^{-1}}{BSF^*(EF/AT)}$$

**TABLE 8**  
**COMPARISON OF MAXIMUM CONCENTRATIONS DETECTED IN GROUNDWATER**  
**TO TYPES 1 AND 2 RISK REDUCTION STANDARDS**  
**Former Macon 2 Manufactured Gas Plant Facility**  
**Macon, Georgia**

Parameter	Maximum Detected Concentration* (mg/L)	Type 1 RRS (mg/L)	Source of Type 1 Standard	Type 2 RRS (mg/L)	Source of Type 2 Standard
<b><u>VOCs</u></b>					
Benzene	ND	0.00500	a	0.00545	d
Carbon Disulfide	ND	4.00	a	0.329	d
Ethylbenzene	ND	0.700	a	0.0582	d
Methylene Chloride	ND	0.00500	a	0.0622	c
Methyl-tert-butyl-ether	NA	DL	b	1.79	d
Toluene	ND	1.00	a	0.221	d
Xylenes	ND	10.0	a	31.3	d
<b><u>SVOCs</u></b>					
Acenaphthene	0.014	2.00	a	0.939	d
Acenaphthylene	ND	DL	b	0.469	d
Anthracene	ND	DL	b	4.69	d
Benzo(a)anthracene	ND	0.000100	a	0.000450	c
Benzo(a)pyrene	ND	0.000200	a	0.000450	c
Benzo(b)fluoranthene	ND	0.000200	a	0.000450	c
Benzo(g,h,i)perylene	ND	DL	b	0.469	d
Benzo(k)fluoranthene	ND	DL	b	0.00450	c
Chrysene	ND	DL	b	0.0450	c
Dibenzo(a,h)anthracene	ND	0.000300	a	0.000450	c
Fluoranthene	ND	1.00	a	0.626	d
Fluorene	ND	1.00	a	0.626	d
Indeno(1,2,3-cd)pyrene	ND	0.000400	a	0.000450	c
Naphthalene	ND	0.0200	a	0.00187	d
Phenanthrene	ND	DL	b	0.469	d
Phenol	ND	4.00	a	9.39	d
Pyrene	ND	1.00	a	0.469	d
<b><u>Inorganics</u></b>					
Arsenic	ND	0.0500	a	0.000568	c
Barium	1.85	2.00	a	1.10	d
Beryllium	ND	0.00500	a	0.0313	d
Cadmium	ND	0.00500	a	0.00782	c
Chromium	ND	0.100	a	0.0469	d
Copper	ND	1.30	a	0.626	d
Cyanide	0.048	0.200	a	0.313	d
Lead	ND	0.0150	a	0.0150	a
Mercury	ND	0.00200	a	0.00469	d
Nickel	ND	0.100	a	0.313	d
Vanadium	ND	0.200	a	0.110	d
Zinc	ND	2.00	a	4.69	d

Blocked values = Risk Reduction Standard exceeded

a = Appendix III Table 1 (GEPD, 1999)

b = Detection limit

c = Upperbound excess cancer risk

d = Noncarcinogenic risk

\* = Based on August 2003 sampling event.

**TABLE 9**  
**TYPE 2 RISK REDUCTION STANDARDS FOR POTENTIAL**  
**RESIDENTIAL (CHILD AND ADULT) EXPOSURE TO GROUNDWATER**  
**Former Macon 2 Manufactured Gas Plant**  
**Macon, Georgia**

Parameter	Calculated Goal Child (Noncarc) (mg/L)	Calculated Goal Child (Carc) (mg/L)	Calculated Goal Adult (Noncarc) (mg/L)	Calculated Goal Adult (Carc) (mg/L)	Type 2 RRSs (mg/L)
<b><u>VOCs</u></b>					
Benzene	0.01394	0.007087	0.05320	0.005451	0.00545
Carbon Disulfide	0.3293	NA	1.270	NA	0.329
Ethylbenzene	0.4362	0.06239	1.592	0.05823	0.0582
Methylene Chloride	0.6182	0.09182	1.736	0.06222	0.0622
Methyl-tert-butyl-ether	1.787	NA	8.341	NA	1.79
Toluene	0.2210	NA	0.9632	NA	0.221
Xylenes	31.29	NA	73.00	NA	31.3
<b><u>SVOCs</u></b>					
Acenaphthene	0.9386	NA	2.190	NA	0.939
Acenaphthylene	0.4693	NA	1.095	NA	0.469
Anthracene	4.693	NA	10.95	NA	4.69
Benzo(a)anthracene	NA	0.000597	NA	0.000450	0.000450
Benzo(a)pyrene	NA	0.0000597	NA	0.0000450	0.0000450
Benzo(b)fluoranthene	NA	0.000597	NA	0.000450	0.000450
Benzo(g,h,i)perylene	0.4693	NA	1.095	NA	0.469
Benzo(k)fluoranthene	NA	0.00597	NA	0.00450	0.00450
Chrysene	NA	0.0597	NA	0.0450	0.0450
Dibenzo(a,h)anthracene	NA	0.0000597	NA	0.0000450	0.0000450
Fluoranthene	0.6257	NA	1.460	NA	0.626
Fluorene	0.6257	NA	1.460	NA	0.626
Indeno(1,2,3-cd)pyrene	NA	0.000597	NA	0.000450	0.000450
Naphthalene	0.001866	NA	0.7300	NA	0.00187
Phenanthrene	0.4693	NA	1.095	NA	0.469
Phenol	9.386	NA	21.90	NA	9.39
Pyrene	0.4693	NA	1.095	NA	0.469
<b><u>Inorganics</u></b>					
Arsenic	0.004693	0.00122	0.0110	0.000568	0.000568
Barium	1.095	NA	2.555	NA	1.10
Beryllium	0.03129	NA	0.07300	NA	0.0313
Cadmium	0.007821	NA	0.01825	NA	0.00782
Chromium	0.04693	NA	0.1095	NA	0.0469
Copper	0.6257	NA	1.460	NA	0.626
Cyanide	0.3129	NA	0.7300	NA	0.313
Lead	NA	NA	NA	NA	NA
Mercury	0.004693	NA	0.01095	NA	0.00469
Nickel	0.3129	NA	0.7300	NA	0.313
Vanadium	0.1095	NA	0.2555	NA	0.110
Zinc	4.693	NA	10.95	NA	4.69

**TABLE 9**  
**TYPE 2 RISK REDUCTION STANDARDS FOR POTENTIAL**  
**RESIDENTIAL (CHILD AND ADULT) EXPOSURE TO GROUNDWATER**  
**Former Macon 2 Manufactured Gas Plant**  
**Macon, Georgia**

Noncarcinogens:

$$c = \frac{THI \cdot BW \cdot AT \cdot 365 \text{ days/year}}{EF \cdot ED \cdot [(1/RfD_i \cdot K \cdot IR_a) + (1/RfD_o \cdot IR_w)]}$$

Carcinogens:

$$c = \frac{TR \cdot BW \cdot AT \cdot 365 \text{ days/year}}{EF \cdot ED \cdot [(CSF_i \cdot K \cdot IR_a) + (CSF_o \cdot IR_w)]}$$

where:

THI = Target Hazard Index	1	
BW = Body Weight (kg), child	15	
BW = Body Weight (kg), adult	70	
AT = Averaging Time (years) (carc)	70	
AT = Averaging Time (years), child (noncarc)	6	
AT = Averaging Time (years), adult (noncarc)	30	
EF = Exposure Frequency (days/year)	350	
ED = Exposure Duration (years), child	6	
ED = Exposure Duration (years), adult	30	
K = Volatilization Factor (unitless)	0.5	
IR <sub>a</sub> = Inhalation Rate of Air (m <sup>3</sup> /day), child	15	
IR <sub>a</sub> = Inhalation Rate of Air (m <sup>3</sup> /day), adult	15	
IR <sub>w</sub> = Ingestion Rate of Water (L/day), adult	2	
IR <sub>w</sub> = Ingestion Rate of Water (L/day), child	1	
RfD <sub>o</sub> = Oral Reference Dose		Chemical-specific
RfD <sub>i</sub> = Inhalation Reference Dose		Chemical-specific
TR = Target Risk	1.00E-05	
CSF <sub>o</sub> = Oral Cancer Slope Factor		Chemical-specific
CSF <sub>i</sub> = Inhalation Cancer Slope Factor		Chemical-specific
NA = Not Applicable		

**TABLE 10**  
**COMPARISON OF MAXIMUM DETECTED CONCENTRATIONS**  
**IN GROUNDWATER TO TYPES 3 AND 4 RISK REDUCTION STANDARDS**  
**Former Macon 2 Manufactured Gas Plant Facility**  
**Macon, Georgia**

Parameter	Maximum Detected Concentration* (mg/L)	Type 3 RRS (mg/L)	Source of Type 3 Standard	Type 4 RRS (mg/L)	Source of Type 4 Standard
<b><u>VOCs</u></b>					
Benzene	ND	0.00500	a	0.0088	c
Carbon Disulfide	ND	4.00	a	1.70	d
Ethylbenzene	ND	0.700	a	0.0734	d
Methylene Chloride	ND	0.00500	a	0.119	c
Methyl-tert-butyl-ether	NA	DL	b	8.76	d
Toluene	ND	1.00	a	1.10	d
Xylenes	ND	10.0	a	204	d
<b><u>SVOCs</u></b>					
Acenaphthene	0.014	2.00	a	6.13	d
Acenaphthylene	ND	DL	b	3.07	d
Anthracene	ND	DL	b	30.7	d
Benzo(a)anthracene	ND	0.000100	a	0.000747	c
Benzo(a)pyrene	ND	0.000200	a	0.0000747	c
Benzo(b)fluoranthene	ND	0.000200	a	0.000747	c
Benzo(g,h,i)perylene	ND	DL	a	3.07	d
Benzo(k)fluoranthene	ND	DL	b	0.00747	c
Chrysene	ND	DL	a	0.0747	c
Dibenzo(a,h)anthracene	ND	0.000300	b	0.0000747	c
Fluoranthene	ND	1.00	b	4.09	d
Fluorene	ND	1.00	a	4.09	d
Indeno(1,2,3-cd)pyrene	ND	0.000400	a	0.000747	c
Naphthalene	ND	0.0200	a	0.00916	d
Phenanthrene	ND	DL	b	3.07	d
Phenol	ND	4.00	a	61.3	d
Pyrene	ND	1.00	a	3.07	d
<b><u>Inorganics</u></b>					
Arsenic	ND	0.0500	a	0.00191	c
Barium	1.85	2.00	a	7.15	d
Beryllium	ND	0.00500	a	0.204	d
Cadmium	ND	0.00500	a	0.0511	c
Chromium	ND	0.100	a	0.307	d
Copper	ND	1.30	a	4.09	d
Cyanide	0.048	0.200	a	2.04	d
Lead	ND	0.0150	a	0.0150	d
Mercury	ND	0.00200	a	0.0307	c
Nickel	ND	0.100	a	2.04	d
Vanadium	ND	0.200	a	0.715	d
Zinc	ND	2.00	a	30.7	d

Blocked values = Risk Reduction Standard exceeded

a = Appendix III Table 1 (GEPD, 1999)

b = Detection limit

c = Upperbound excess cancer risk

d = Noncarcinogenic risk

\* = Based on August 2003 sampling event.

**TABLE 11**  
**TYPE 4 RISK REDUCTION STANDARDS**  
**FOR POTENTIAL INDUSTRIAL GROUNDWATER EXPOSURE**  
**Former Macon 2 Manufactured Gas Plant, Macon, Georgia**

Parameter	Calculated Goal (Nonc) (mg/L)	Calculated Goal (Carc) (mg/L)	RRS Type 4 (mg/L)
<b><u>VOCs</u></b>			
Benzene	0.0723	0.0088	0.0088
Carbon Disulfide	1.703	NA	1.70
Ethylbenzene	2.298	0.07337	0.0734
Methylene Chloride	3.612	0.1192	0.119
Methyl-tert-butyl-ether	8.759	NA	8.76
Toluene	1.102	NA	1.10
Xylenes	204.4	NA	204
<b><u>SVOCs</u></b>			
Acenaphthene	6.132	NA	6.13
Acenaphthylene	3.066	NA	3.07
Anthracene	30.66	NA	30.7
Benzo(a)anthracene	NA	0.000747	0.000747
Benzo(a)pyrene	NA	0.0000747	0.0000747
Benzo(b)fluoranthene	NA	0.000747	0.000747
Benzo(g,h,i)perylene	3.066	NA	3.07
Benzo(k)fluoranthene	NA	0.00747	0.00747
Chrysene	NA	0.07472	0.0747
Dibenzo(a,h)anthracene	NA	0.0000747	0.0000747
Fluoranthene	4.088	NA	4.09
Fluorene	4.088	NA	4.09
Indeno(1,2,3-cd)pyrene	NA	0.000747	0.000747
Naphthalene	0.00916	NA	0.00916
Phenanthrene	3.066	NA	3.07
Phenol	61.32	NA	61.3
Pyrene	3.066	NA	3.07
<b><u>Inorganics</u></b>			
Arsenic	0.03066	0.001908	0.00191
Barium	7.154	NA	7.15
Beryllium	0.2044	NA	0.204
Cadmium	0.05110	NA	0.0511
Chromium	0.3066	NA	0.307
Copper	4.088	NA	4.09
Cyanide	2.044	NA	2.04
Lead	NA	NA	NA
Mercury	0.03066	NA	0.0307
Nickel	2.044	NA	2.04
Vanadium	0.7154	NA	0.715
Zinc	30.66	NA	30.7

NA = Not available

TABLE 11  
 TYPE 4 RISK REDUCTION STANDARDS  
 FOR POTENTIAL INDUSTRIAL GROUNDWATER EXPOSURE  
 Former Macon 2 Manufactured Gas Plant, Macon, Georgia

Non-carcinogens:

$$c = \frac{THI \cdot BW \cdot AT \cdot 365 \text{ days/year}}{EF \cdot ED \cdot [(1/RfD_i \cdot K \cdot IR_a) + (1/RfD_o \cdot IR_w)]}$$

Carcinogens:

$$c = \frac{TR \cdot BW \cdot AT \cdot 365 \text{ days/year}}{EF \cdot ED \cdot [(CSF_i \cdot K \cdot IR_a) + (CSF_o \cdot IR_w)]}$$

where:

THI = Target Hazard Index	1
BW = Body Weight (kg), adult	70
AT = Averaging Time (years) adult (nonc)	25
AT = Averaging Time (years) adult (carc)	70
EF = Exposure Frequency (days/year)	250
ED = Exposure Duration (year), adult (nonc)	25
K = Volatilization Factor (unitless)	0.5
IR <sub>a</sub> = Inhalation Rate of Air (m <sup>3</sup> /day), adult	20
IR <sub>w</sub> = Ingestion Rate of Water (L/day), adult	1
RfD <sub>o</sub> = Oral Reference Dose	Chemical-specific
RfD <sub>i</sub> = Inhalation Reference Dose	Chemical-specific
TR = Target Risk	1.00E-05
CSF <sub>o</sub> = Oral Cancer Slope Factor	Chemical-specific
CSF <sub>i</sub> = Inhalation Cancer Slope Factor	Chemical-specific
NA = Not Applicable	

Table 12

PROTECTED ANIMAL AND PLANT SPECIES POTENTIALLY OCCURRING IN BIBB COUNTY AND THE SURROUNDING COUNTIES OF CRAWFORD, HOUSTON, JONES, MONROE, PEACH, AND TWIGGS

Macon 2 Former Manufactured Gas Plant Facility  
Macon, Georgia

Species Name	County	Federal Status <sup>(a)</sup>	State Status <sup>(b)</sup>	Preferred Habitat
<b>BIRDS</b>				
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Bibb, Crawford, Houston, Jones, Monroe, Peach, Twiggs	T	E	Associated with coasts, river and lakes, usually nesting within sight of large bodies of water.
Wood stork ( <i>Mycteria americana</i> )	Bibb, Crawford, Houston, Jones, Peach, Twiggs	E	E	Primarily feed on fish in fresh and brackish wetlands and nest in cypress or other wooded swamps.
Red-cockaded woodpecker ( <i>Picoides borealis</i> )	Bibb, Crawford, Houston, Jones, Monroe, Peach, Twiggs	E	E	Nest in mature pine with low understory vegetation, forage in pine hardwood stands greater than 30 years of age.
<b>FISHES</b>				
Bluestripe shiner ( <i>Cyprinella calliaenia</i> )	Crawford	NL	T	Restricted to the Apalachicola - Chattahoochee-Flint (ACF) River system, in large streams with open, sand or rock-bottomed channels with flowing water and little or no aquatic vegetation.
<b>MUSSELS</b>				
Purple banklimber mussel ( <i>Elliptoides sloatianus</i> )	Crawford, Peach	T	T	Main channels of ACF Basin rivers in moderate currents over sand, sand mixed mud, or gravel substrates.
Shiny-rayed pocketbook mussel ( <i>Lampsilis subangulata</i> )	Crawford, Peach	E	E	Medium Creeks to mainstream of rivers (Choctawhatchee and Ochlockonee only) with slow to moderate currents over sandy substrates and associated with rock or clay.
Gulf moccasinshell mussel ( <i>Medionidus pencillatus</i> )	Crawford, Peach	E	E	Medium creeks to mainstream of rivers (Choctawhatchee and Ochlockonee only) with slow to moderate currents over sandy substrates and associated with rock or clay.
Oval pigtoe mussel ( <i>Pleurobema pyriforme</i> )	Crawford, Peach	E	E	River tributaries and main channels (Apalachicola, Chattahoochee, and Flint basin) in slow to moderate currents over silty sand, muddy sand, sand, and gravel substrates.

Species Name	County	Federal Status (a)	State Status (b)	Preferred Habitat
<b>PLANTS</b>				
Shoals spider-lily ( <i>Hymenocallis coronaria</i> )	Bibb	NL	E	Major streams and rivers in rocky shoals and in cracks of exposed bedrock, plants can be completely submerged during flooding.
Green pitcher-plant ( <i>Sarracenia oreophila</i> )	Bibb	E	E	Open seepy meadows along sandy flushed banks of streams, and in partially shaded red maple-blackgum low woods or poorly drained oak-pine flatwoods; believed to be extirpated from Bibb County.
Sweet pitcher-plant ( <i>Sarracnia rubra</i> )	Bibb, Crawford, Peach	NL	E	Acidic soils of open bogs, sandhill seeps, Atlantic white cedar swamps, wet savannas, and low areas in pine flatwoods and along sloughs and ditches.
Ocmulgee skullcap ( <i>Scutellaria ocmulgee</i> )	Bibb, Houston	NFS	T	Prefers forested terraces, hardwood slopes and riverbanks of tributaries to the Ocmulgee, Oconee, and Savannah Rivers.
Fringed campion ( <i>Silene polypetala</i> )	Bibb, Crawford	E	E	Mature hardwood or hardwood-pine forests on river bluffs, small stream terraces, moist slopes and well shaded ridge crests.
Relict trillium ( <i>Trillium reliquum</i> )	Bibb, Houston, Jones	E	E	Hardwood forests; in the Piedmont on either rich ravines or adjacent alluvial terraces with other spring-flowering herbs.
Indian olive ( <i>Nestronia umbellula</i> )	Peach	NFS	T	Dry open upland pine-hardwood forests.
<b>AMPHIBIANS AND REPTILES</b>				
Eastern indigo snake ( <i>Drymarchon corais couperi</i> )	Bibb, Houston, Twiggs	T	T	Winters in xeric sandhills habitat associated with gopher tortoises; forages in creek bottoms, upland forests, and agricultural fields during the warm months.
Barbour's map turtle ( <i>Graptemys barbouri</i> )	Crawford	NFS	T	Restricted to Apalachicola River and large tributaries including Chipola, Chattahoochee, and Flint Rivers in eastern Alabama, western Georgia, and western Florida.
Alligator snapping turtle ( <i>Macroclermys temminckii</i> )	Crawford, Peach	NFS	R	Rivers, lakes, and large ponds
Gopher tortoise ( <i>Gopherus polyphemus</i> )	Bibb, Crawford, Houston	NFS	T	Well drained sandy soils in forest and grassy areas often associated with pine overstory with grass associated with pine overstory and open understory with grass and groundcover, and sunny areas for nesting.

Source: <http://www.fws.gov/h4gaf/>

(a) Federal; E = Endangered; T = Threatened; NFS = No Federal Status

(b) State; E = Endangered; T = Threatened

**COMPLIANCE STATUS INVESTIGATION REPORT**  
**ATTACHMENT A**

**FORMER MACON 2 MGP FACILITY**  
**MACON, GEORGIA**

WILLIAMS PROJECT NO. 1100-2990

June 17, 2002 - Revised September 5, 2003

Williams Project No. 1100-2990

**COMPLIANCE STATUS  
INVESTIGATION REPORT  
ATTACHMENT A  
FORMER MACON 2 MGP FACILITY  
MACON, GEORGIA**

*Prepared For:*  
**Georgia Power Company  
Atlanta Gas Light Company  
and  
The City of Macon**

*Prepared By:*  
**WILLIAMS ENVIRONMENTAL SERVICES INC.  
500 Chase Park South, Suite 150  
Birmingham, Alabama 35244**

*Preparation Date: June 17, 2002  
Revised September 5, 2003*





ANALYTICAL ENVIRONMENTAL SERVICES, INC.

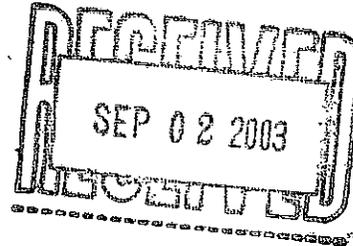
August 25, 2003

Mike Dillon  
Williams Environmental Services, Inc  
500 Chase Park South  
Suite 150  
Birmingham, AL 35244

TEL: (205) 988-8305

FAX (205) 988-5249

RE: Macon II MGP



Order No.: 0308662

Dear Mike Dillon:

Analytical Environmental Servs, Inc. received 16 samples on 8/21/2003 9:50:00 AM for the analyses presented in the following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative. AES' certifications are as follows:

- NELAC/Florida Certification number E87582 for analysis of Environmental Water, soil/hazardous waste, and Drinking Water, effective 07/02/03-06/30/04.
- AIHA Certification number 505 for analysis of Air, Paint Chips, Soil and Dust Wipes, effective until 10/01/03.

These results relate only to the items tested. This report may only be reproduced in full and contains 20 total pages (including cover letter).

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Allison Cantrell  
Project Manager





**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Lab Order:** 0308662  
**Project:** Macon II MGP  
**Lab ID:** 0308662-001

**Client Sample ID:** SB-44-0-2  
**Collection Date:** 8/20/2003 7:30:00 AM  
**Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>		<b>SW6010B</b>				Analyst: CDW
Lead	12.1	5.79		mg/Kg-dry	1	8/25/2003 12:57:00 AM
<b>PERCENT MOISTURE</b>		<b>D2216</b>				Analyst: DCC
Percent Moisture	20.1	0		wt%	1	8/21/2003 5:00:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308662  
 Project: Macon II MGP  
 Lab ID: 0308662-002

Client Sample ID: SB-44-5-7  
 Collection Date: 8/20/2003 7:40:00 AM  
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>						Analyst: CDW
Lead	25.3	5.67		mg/Kg-dry	1	8/25/2003 1:02:00 AM
<b>PERCENT MOISTURE</b>						Analyst: DCC
Percent Moisture	14.4	0		wt%	1	8/21/2003 5:00:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Lab Order:** 0308662  
**Project:** Macon II MGP  
**Lab ID:** 0308662-003

**Client Sample ID:** SB-44-10-12  
**Collection Date:** 8/20/2003 7:50:00 AM  
**Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>		<b>SW6010B</b>				Analyst: CDW
Lead	181	5.76		mg/Kg-dry	1	8/25/2003 1:06:00 AM
<b>PERCENT MOISTURE</b>		<b>D2216</b>				Analyst: DCC
Percent Moisture	14.6	0		wt%	1	8/21/2003 5:00:00 PM

**Qualifiers:**

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
BRL	Below Reporting Limit	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
N	Analyte not NELAC certified	P	NELAC analyte certification pending
Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308662  
 Project: Macon II MGP  
 Lab ID: 0308662-004

Client Sample ID: SB-44-15-17  
 Collection Date: 8/20/2003 8:00:00 AM  
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>		<b>SW6010B</b>				Analyst: <b>CDW</b>
Lead	BRL	5.53		mg/Kg-dry	1	8/25/2003 1:11:00 AM
<b>PERCENT MOISTURE</b>		<b>D2216</b>				Analyst: <b>DCC</b>
Percent Moisture	11.5	0		wt%	1	8/21/2003 5:00:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

**Date:** 25-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Lab Order:** 0308662  
**Project:** Macon II MGP  
**Lab ID:** 0308662-005

**Client Sample ID:** SB-44-20-21  
**Collection Date:** 8/20/2003 8:16:00 AM  
**Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>						Analyst: CDW
Lead	BRL	5.54		mg/Kg-dry	1	8/25/2003 1:15:00 AM
<b>PERCENT MOISTURE</b>						Analyst: DCC
Percent Moisture	12.9	0		wt%	1	8/21/2003 5:00:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Lab Order:** 0308662  
**Project:** Macon II MGP  
**Lab ID:** 0308662-006

**Client Sample ID:** SB-45-0-2  
**Collection Date:** 8/20/2003 8:36:00 AM  
**Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>		<b>SW6010B</b>				Analyst: CDW
Lead	58.5	5.42		mg/Kg-dry	1	8/25/2003 1:31:00 AM
<b>PERCENT MOISTURE</b>		<b>D2216</b>				Analyst: DCC
Percent Moisture	15.4	0		wt%	1	8/21/2003 5:00:00 PM

**Qualifiers:** \* Value exceeds Maximum Contaminant Level  
BRL Below Reporting Limit  
H Holding times for preparation or analysis exceeded  
N Analyte not NELAC certified  
Rpt Limit Reporting Limit

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P NELAC analyte certification pending  
S Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Lab Order:** 0308662  
**Project:** Macon II MGP  
**Lab ID:** 0308662-007

**Client Sample ID:** SB-45-5-7  
**Collection Date:** 8/20/2003 8:40:00 AM

**Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>						Analyst: <b>CDW</b>
Lead	35.6	4.50		mg/Kg-dry	1	8/25/2003 1:35:00 AM
<b>PERCENT MOISTURE</b>						Analyst: <b>DCC</b>
Percent Moisture	9.10	0		wt%	1	8/21/2003 5:00:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Lab Order:** 0308662  
**Project:** Macon II MGP  
**Lab ID:** 0308662-008

**Client Sample ID:** SB-45-10-12  
**Collection Date:** 8/20/2003 8:50:00 AM

**Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>						Analyst: CDW
Lead	425	4.33		mg/Kg-dry	1	8/25/2003 1:40:00 AM
<b>PERCENT MOISTURE</b>						Analyst: DCC
Percent Moisture	11.2	0		wt%	1	8/21/2003 5:00:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Lab Order:** 0308662  
**Project:** Macon II MGP  
**Lab ID:** 0308662-009

**Client Sample ID:** SB-45-15-17  
**Collection Date:** 8/20/2003 9:00:00 AM  
**Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>						Analyst: CDW
Lead	1070	5.51		mg/Kg-dry	1	8/25/2003 1:44:00 AM
<b>PERCENT MOISTURE</b>						Analyst: DCC
Percent Moisture	33.3	0		wt%	1	8/21/2003 5:00:00 PM

**Qualifiers:**

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
BRL	Below Reporting Limit	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
N	Analyte not NELAC certified	P	NELAC analyte certification pending
Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308662  
 Project: Macon II MGP  
 Lab ID: 0308662-010

Client Sample ID: SB-45-18.5-20  
 Collection Date: 8/20/2003 9:10:00 AM  
 Matrix: SOIL

Analyses	Result	Limit Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>		<b>SW6010B</b>			Analyst: <b>CDW</b>
Lead	38.6	4.48	mg/Kg-dry	1	8/25/2003 1:49:00 AM
<b>PERCENT MOISTURE</b>		<b>D2216</b>			Analyst: <b>DCC</b>
Percent Moisture	17.7	0	wt%	1	8/21/2003 5:00:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Lab Order:** 0308662  
**Project:** Macon II MGP  
**Lab ID:** 0308662-011

**Client Sample ID:** SB-46-0-2  
**Collection Date:** 8/20/2003 9:50:00 AM  
**Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>						Analyst: <b>CDW</b>
Lead	15.6	4.84		mg/Kg-dry	1	8/25/2003 1:53:00 AM
<b>PERCENT MOISTURE</b>						Analyst: <b>DCC</b>
Percent Moisture	23.8	0		wt%	1	8/21/2003 5:00:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Lab Order:** 0308662  
**Project:** Macon II MGP  
**Lab ID:** 0308662-012

**Client Sample ID:** SB-46-5-7  
**Collection Date:** 8/20/2003 10:00:00 AM

**Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>		<b>SW6010B</b>				Analyst: <b>CDW</b>
Lead	70.6	3.82		mg/Kg-dry	1	8/25/2003 1:58:00 AM
<b>PERCENT MOISTURE</b>		<b>D2216</b>				Analyst: <b>DCC</b>
Percent Moisture	24.4	0		wt%	1	8/21/2003 5:00:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Lab Order:** 0308662  
**Project:** Macon II MGP  
**Lab ID:** 0308662-013

**Client Sample ID:** SB-46-10-12  
**Collection Date:** 8/20/2003 10:10:00 AM  
**Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>						Analyst: CDW
Lead	34.5	4.51		mg/Kg-dry	1	8/25/2003 2:02:00 AM
<b>PERCENT MOISTURE</b>						Analyst: DCC
Percent Moisture	24.2	0		wt%	1	8/21/2003 5:00:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308662  
 Project: Macon II MGP  
 Lab ID: 0308662-014

Client Sample ID: SB-46-15-17  
 Collection Date: 8/20/2003 10:20:00 AM  
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>						Analyst: CDW
Lead	20.0	3.78		mg/Kg-dry	1	8/25/2003 2:07:00 AM
<b>PERCENT MOISTURE</b>						Analyst: DCC
Percent Moisture	15.7	0		wt%	1	8/21/2003 5:00:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 25-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Lab Order:** 0308662  
**Project:** Macon II MGP  
**Lab ID:** 0308662-015

**Client Sample ID:** DUP082003A  
**Collection Date:** 8/20/2003  
**Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>METALS, TOTAL</b>		<b>SW6010B</b>				Analyst: <b>CDW</b>
Lead	37.8	3.65		mg/Kg-dry	1	8/25/2003 12:44:00 AM
<b>PERCENT MOISTURE</b>		<b>D2216</b>				Analyst: <b>DCC</b>
Percent Moisture	18.5	0		wt%	1	8/21/2003 5:00:00 PM

**Qualifiers:**

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
BRL	Below Reporting Limit	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
N	Analyte not NELAC certified	P	NELAC analyte certification pending
Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client Williams Law Services

Work Order Number 0308662

Checklist completed by Dyane Ogden 3/21/03  
Signature Date

Carrier name: FedEx  UPS  Courier  Client  US Mail  Other

Shipping container/cooler in good condition? Yes  No  Not Present

Custody seals intact on shipping container/cooler? Yes  No  Not Present

Custody seals intact on sample bottles? Yes  No  Not Present

Container/Temp Blank temperature in compliance? Yes  No

Cooler #1 5.0°C Cooler #2 \_\_\_\_\_ Cooler #3 \_\_\_\_\_ Cooler #4 \_\_\_\_\_ Cooler #5 \_\_\_\_\_ Cooler #6 \_\_\_\_\_

Chain of custody present? Yes  No

Chain of custody signed when relinquished and received? Yes  No

Chain of custody agrees with sample labels? Yes  No

Samples in proper container/bottle? Yes  No

Sample containers intact? Yes  No

Sufficient sample volume for indicated test? Yes  No

All samples received within holding time? Yes  No

Was TAT marked on the COC? Yes  No

Proceed with Standard TAT as per project history? Yes  No  Not Applicable

Water - VOA vials have zero headspace? No VOA vials submitted  Yes  No

Water - pH acceptable upon receipt? Yes  No  Not Applicable

Adjusted? \_\_\_\_\_ Checked by \_\_\_\_\_

Case Narrative for resolution of the Non-Conformance.

Analytical Environmental Servs, Inc.

Date: 25-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Work Order: 0308662  
 Project: Macon II MGP

ANALYTICAL QC SUMMARY REPORT

BatchID: 37297

Sample ID	MB-37297	SampType: MBLK	TestCode: 6010B_S	Units: mg/Kg	Prep Date: 8/21/2003	RunNo: 41861					
Client ID:		Batch ID: 37297	TestNo: SW6010B		Analysis Date: 8/25/2003	SeqNo: 762036					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	BRL	5.00									

Sample ID	LCS-37297	SampType: LCS	TestCode: 6010B_S	Units: mg/Kg	Prep Date: 8/21/2003	RunNo: 41861					
Client ID:		Batch ID: 37297	TestNo: SW6010B		Analysis Date: 8/25/2003	SeqNo: 762035					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	48.22	5.00	50	0	96.4	80	120	0	0	0	

Sample ID	0308662-015AMS	SampType: MS	TestCode: 6010B_S	Units: mg/Kg-dry	Prep Date: 8/21/2003	RunNo: 41861					
Client ID:	DUP082003A	Batch ID: 37297	TestNo: SW6010B		Analysis Date: 8/25/2003	SeqNo: 762039					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	75.08	3.70	36.96	37.76	101	75	125	0	0	0	

Sample ID	0308662-015ADUP	SampType: DUP	TestCode: 6010B_S	Units: mg/Kg-dry	Prep Date: 8/21/2003	RunNo: 41861					
Client ID:	DUP082003A	Batch ID: 37297	TestNo: SW6010B		Analysis Date: 8/25/2003	SeqNo: 762038					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	42.63	3.73	0	0	0	0	0	37.76	12.1	20	

Qualifiers: B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits  
 BRL Below Reporting Limit  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits  
 E Value above quantitation range  
 N Analyte not NELAC certified



AES

August 27, 2003

ANALYTICAL ENVIRONMENTAL SERVICES, INC.



Matt Ebbert  
Williams Environmental Services, Inc  
500 Chase Park South  
Suite 150  
Birmingham, AL 35244

TEL: (205) 988-8305

FAX (205) 988-5249

RE: Macon II MGP

Order No.: 0308663

Dear Matt Ebbert:

Analytical Environmental Servs, Inc. received 10 samples on 8/21/2003 12:30:00 PM for the analyses presented in the following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative. AES' certifications are as follows:

-NELAC/Florida Certification number E87582 for analysis of Environmental Water, soil/hazardous waste, and Drinking Water, effective 07/02/03-06/30/04.

-AIHA Certification number 505 for analysis of Air, Paint Chips, Soil and Dust Wipes, effective until 10/01/03.

These results relate only to the items tested. This report may only be reproduced in full and contains 4 total pages (including cover letter).

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Allison Cantrell  
Project Manager

CHAFF CUSTODY

ANALYTICAL ENVIRONMENTAL SERVICES, INC.  
 15 Presidential Pkwy., Atlanta, GA 30340-3704  
 L: (770) 457-8177 / TOLL FREE: (800) 972-4889 / FAX: (770) 457-8188

SAMPLE ID	SAMPLED		Grab	Composite	Matrix (See codes)	ANALYSIS REQUESTED		REMARKS	No # of Containers
	DATE	TIME				WCS	MS		
MW-5	3/20/03	0745	X		GW	✓			6
MW-2	3/20/03	0820	X		GW	✓			6
MW-3	3/20/03	1300	X		GW	✓			6
MW-4	3/20/03	1415	X		GW	✓			6
MW-7	3/21/03	0815	X		GW	✓			6
MW-6	3/21/03	0650	X		GW	✓			6
MW-1	3/21/03	0830	X		GW	✓			6
RA082103	3/21/03	1000	X		GW	✓			6
TH082103	3/21/03	1005	X		GW	✓			2

INQUIRED BY: <u>Peter N. Robinson</u>	DATE/TIME RECEIVED BY: <u>3/21/03</u>	DATE/TIME: <u>12:30</u>
PROJECT NAME: <u>MACON II</u>	PROJECT INFORMATION: <u>MACON II</u>	RECEIPT: <u>56</u>
PROJECT #: <u>1102590</u>		Total # of Containers: <u>56</u>
SITE ADDRESS: <u>MACON, GA</u>		Turnaround Time Request: <u>Standard 3-5 Business Days</u>
PROJECT MANAGER: <u>MAF Stewart</u>		Same Day Rush (auth req.): <u>0</u>
INVOICE TO: (IF DIFFERENT FROM ABOVE)		Next Business Day Rush: <u>0</u>
		2 Business Day Rush: <u>0</u>
		Other: <u>0</u>
PROGRAM (see codes):		
DATA PACKAGE: <u>I</u> <u>II</u> <u>III</u> <u>IV</u>		

COMPANY: West  
 ADDRESS: 500 Chase Park South  
Suite 150  
Birmingham, AL  
 FAX: 205-988-5291  
 SIGNED BY: Peter N. Robinson

SHIPMENT METHOD: CLIENT FedEx UPS MAIL COURIER  
 GREYHOUND OTHER

OUT: 1 VIA: 1  
 IN: 1 VIA: 1

FINAL INSTRUCTIONS/COMMENTS:

DATE CONTRACT #:

FIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

SHRATIVE CODES: H = Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify) NA = None

GRAM: FLUJ FLIX ALUJ TNUJ MSUJ NCUJ SCUJ GAUJ FCONV

White Copy - ORIGINAL; Yellow Copy - LAB; Pink Copy - CLIENT

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-001

Client Sample ID: MW-5  
 Collection Date: 8/20/2003 7:45:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>TOTAL METALS BY ICP/MS</b>		<b>SW6020</b>		Analyst: SSS		
Arsenic	BRL	20.0		µg/L	1	8/25/2003 12:03:34 PM
Barium	1850	200		µg/L	10	8/26/2003 12:57:43 PM
Beryllium	BRL	5.00		µg/L	1	8/25/2003 12:03:34 PM
Cadmium	BRL	5.00		µg/L	1	8/25/2003 12:03:34 PM
Chromium	BRL	10.0		µg/L	1	8/25/2003 12:03:34 PM
Copper	BRL	10.0		µg/L	1	8/25/2003 12:03:34 PM
Lead	BRL	10.0		µg/L	1	8/25/2003 12:03:34 PM
Nickel	BRL	20.0		µg/L	1	8/25/2003 12:03:34 PM
Vanadium	BRL	10.0		µg/L	1	8/25/2003 12:03:34 PM
Zinc	BRL	20.0		µg/L	1	8/25/2003 12:03:34 PM
<b>MERCURY, TOTAL</b>		<b>SW7470A</b>		Analyst: JDJ		
Mercury	BRL	0.00050		mg/L	1	8/25/2003
<b>SEMIVOLATILE ORG. COMP. BY GC/MS</b>		<b>SW8270C</b>		Analyst: EP		
Acenaphthene	14	10		µg/L	1	8/22/2003 10:02:00 PM
Acenaphthylene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Anthracene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Benz(a)anthracene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Benzo(a)pyrene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Benzo(b)fluoranthene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Benzo(k)fluoranthene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Chrysene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Fluoranthene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Fluorene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Naphthalene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Phenanthrene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Phenol	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Pyrene	BRL	10		µg/L	1	8/22/2003 10:02:00 PM
Surr: 2,4,6-Tribromophenol	118	37-127		%REC	1	8/22/2003 10:02:00 PM
Surr: 2-Fluorobiphenyl	97.7	43-110		%REC	1	8/22/2003 10:02:00 PM
Surr: 2-Fluorophenol	66.3	13-100		%REC	1	8/22/2003 10:02:00 PM
Surr: 4-Terphenyl-d14	87.6	10-121		%REC	1	8/22/2003 10:02:00 PM
Surr: Nitrobenzene-d5	82.7	40-110		%REC	1	8/22/2003 10:02:00 PM
Surr: Phenol-d5	20.5	10-121		%REC	1	8/22/2003 10:02:00 PM
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>		Analyst: AD		
Benzene	BRL	5.0		µg/L	1	8/22/2003 9:11:00 PM
Carbon disulfide	BRL	5.0		µg/L	1	8/22/2003 9:11:00 PM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-001

Client Sample ID: MW-5  
 Collection Date: 8/20/2003 7:45:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>				Analyst: AD
Ethylbenzene	BRL	5.0		µg/L	1	8/22/2003 9:11:00 PM
Methylene chloride	BRL	5.0		µg/L	1	8/22/2003 9:11:00 PM
Toluene	BRL	5.0		µg/L	1	8/22/2003 9:11:00 PM
Xylenes, Total	BRL	5.0		µg/L	1	8/22/2003 9:11:00 PM
Surr: 4-Bromofluorobenzene	88.6	71.8-143		%REC	1	8/22/2003 9:11:00 PM
Surr: Dibromofluoromethane	93.4	80.3-123		%REC	1	8/22/2003 9:11:00 PM
Surr: Toluene-d8	89.1	70.1-142		%REC	1	8/22/2003 9:11:00 PM
<b>CYANIDE</b>		<b>SW9014</b>				Analyst: VS
Cyanide, Total	BRL	0.010		mg/L	1	8/21/2003 6:20:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-002

Client Sample ID: MW-2  
 Collection Date: 8/20/2003 8:20:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>TOTAL METALS BY ICP/MS</b>		<b>SW6020</b>		Analyst: SSS		
Arsenic	BRL	20.0		µg/L	1	8/25/2003 12:12:38 PM
Barium	178	20.0		µg/L	1	8/25/2003 12:12:38 PM
Beryllium	BRL	5.00		µg/L	1	8/25/2003 12:12:38 PM
Cadmium	BRL	5.00		µg/L	1	8/25/2003 12:12:38 PM
Chromium	BRL	10.0		µg/L	1	8/25/2003 12:12:38 PM
Copper	BRL	10.0		µg/L	1	8/25/2003 12:12:38 PM
Lead	BRL	10.0		µg/L	1	8/25/2003 12:12:38 PM
Nickel	BRL	20.0		µg/L	1	8/25/2003 12:12:38 PM
Vanadium	BRL	10.0		µg/L	1	8/25/2003 12:12:38 PM
Zinc	BRL	20.0		µg/L	1	8/25/2003 12:12:38 PM
<b>MERCURY, TOTAL</b>		<b>SW7470A</b>		Analyst: JDJ		
Mercury	BRL	0.00050		mg/L	1	8/25/2003
<b>SEMIVOLATILE ORG. COMP. BY GC/MS</b>		<b>SW8270C</b>		Analyst: EP		
Acenaphthene	12	10		µg/L	1	8/22/2003 10:38:00 PM
Acenaphthylene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Anthracene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Benz(a)anthracene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Benzo(a)pyrene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Benzo(b)fluoranthene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Benzo(k)fluoranthene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Chrysene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Fluoranthene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Fluorene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Naphthalene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Phenanthrene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Phenol	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Pyrene	BRL	10		µg/L	1	8/22/2003 10:38:00 PM
Surr: 2,4,6-Tribromophenol	109	37-127		%REC	1	8/22/2003 10:38:00 PM
Surr: 2-Fluorobiphenyl	92.5	43-110		%REC	1	8/22/2003 10:38:00 PM
Surr: 2-Fluorophenol	62.8	13-100		%REC	1	8/22/2003 10:38:00 PM
Surr: 4-Terphenyl-d14	81.9	10-121		%REC	1	8/22/2003 10:38:00 PM
Surr: Nitrobenzene-d5	80.2	40-110		%REC	1	8/22/2003 10:38:00 PM
Surr: Phenol-d5	39.7	10-121		%REC	1	8/22/2003 10:38:00 PM
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>		Analyst: AD		
Benzene	BRL	5.0		µg/L	1	8/22/2003 9:42:00 PM
Carbon disulfide	BRL	5.0		µg/L	1	8/22/2003 9:42:00 PM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-002

Client Sample ID: MW-2  
 Collection Date: 8/20/2003 8:20:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>				Analyst: AD
Ethylbenzene	BRL	5.0		µg/L	1	8/22/2003 9:42:00 PM
Methylene chloride	BRL	5.0		µg/L	1	8/22/2003 9:42:00 PM
Toluene	BRL	5.0		µg/L	1	8/22/2003 9:42:00 PM
Xylenes, Total	BRL	5.0		µg/L	1	8/22/2003 9:42:00 PM
Surr: 4-Bromofluorobenzene	88.4	71.8-143		%REC	1	8/22/2003 9:42:00 PM
Surr: Dibromofluoromethane	101	80.3-123		%REC	1	8/22/2003 9:42:00 PM
Surr: Toluene-d8	91.1	70.1-142		%REC	1	8/22/2003 9:42:00 PM
<b>CYANIDE</b>		<b>SW9014</b>				Analyst: VS
Cyanide, Total	0.048	0.010		mg/L	1	8/21/2003 6:20:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-003

Client Sample ID: MW-3  
 Collection Date: 8/20/2003 1:00:00 PM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>TOTAL METALS BY ICP/MS</b>		<b>SW6020</b>		Analyst: SSS		
Arsenic	BRL	20.0		µg/L	1	8/25/2003 12:17:12 PM
Barium	699	20.0		µg/L	1	8/25/2003 12:17:12 PM
Beryllium	BRL	5.00		µg/L	1	8/25/2003 12:17:12 PM
Cadmium	BRL	5.00		µg/L	1	8/25/2003 12:17:12 PM
Chromium	BRL	10.0		µg/L	1	8/25/2003 12:17:12 PM
Copper	BRL	10.0		µg/L	1	8/25/2003 12:17:12 PM
Lead	BRL	10.0		µg/L	1	8/25/2003 12:17:12 PM
Nickel	BRL	20.0		µg/L	1	8/25/2003 12:17:12 PM
Vanadium	BRL	10.0		µg/L	1	8/25/2003 12:17:12 PM
Zinc	BRL	20.0		µg/L	1	8/25/2003 12:17:12 PM
<b>MERCURY, TOTAL</b>		<b>SW7470A</b>		Analyst: JDJ		
Mercury	BRL	0.00050		mg/L	1	8/25/2003
<b>SEMIVOLATILE ORG. COMP. BY GC/MS</b>		<b>SW8270C</b>		Analyst: EP		
Acenaphthene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Acenaphthylene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Anthracene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Benz(a)anthracene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Benzo(a)pyrene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Benzo(b)fluoranthene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Benzo(k)fluoranthene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Chrysene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Fluoranthene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Fluorene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Naphthalene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Phenanthrene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Phenol	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Pyrene	BRL	10		µg/L	1	8/22/2003 11:15:00 PM
Surr: 2,4,6-Tribromophenol	107	37-127		%REC	1	8/22/2003 11:15:00 PM
Surr: 2-Fluorobiphenyl	89.2	43-110		%REC	1	8/22/2003 11:15:00 PM
Surr: 2-Fluorophenol	60.1	13-100		%REC	1	8/22/2003 11:15:00 PM
Surr: 4-Terphenyl-d14	85.5	10-121		%REC	1	8/22/2003 11:15:00 PM
Surr: Nitrobenzene-d5	74.4	40-110		%REC	1	8/22/2003 11:15:00 PM
Surr: Phenol-d5	43.0	10-121		%REC	1	8/22/2003 11:15:00 PM
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>		Analyst: AD		
Benzene	BRL	5.0		µg/L	1	8/22/2003 10:13:00 PM
Carbon disulfide	BRL	5.0		µg/L	1	8/22/2003 10:13:00 PM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-003

Client Sample ID: MW-3  
 Collection Date: 8/20/2003 1:00:00 PM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>				Analyst: AD
Ethylbenzene	BRL	5.0		µg/L	1	8/22/2003 10:13:00 PM
Methylene chloride	BRL	5.0		µg/L	1	8/22/2003 10:13:00 PM
Toluene	BRL	5.0		µg/L	1	8/22/2003 10:13:00 PM
Xylenes, Total	BRL	5.0		µg/L	1	8/22/2003 10:13:00 PM
Surr: 4-Bromofluorobenzene	88.8	71.8-143		%REC	1	8/22/2003 10:13:00 PM
Surr: Dibromofluoromethane	91.9	80.3-123		%REC	1	8/22/2003 10:13:00 PM
Surr: Toluene-d8	91.6	70.1-142		%REC	1	8/22/2003 10:13:00 PM
<b>CYANIDE</b>		<b>SW9014</b>				Analyst: VS
Cyanide, Total	BRL	0.010		mg/L	1	8/21/2003 6:20:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-004

Client Sample ID: MW-4  
 Collection Date: 8/20/2003 2:15:00 PM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>TOTAL METALS BY ICP/MS</b>		<b>SW6020</b>		Analyst: SSS		
Arsenic	BRL	20.0		µg/L	1	8/25/2003 12:21:48 PM
Barium	389	20.0		µg/L	1	8/25/2003 12:21:48 PM
Beryllium	BRL	5.00		µg/L	1	8/25/2003 12:21:48 PM
Cadmium	BRL	5.00		µg/L	1	8/25/2003 12:21:48 PM
Chromium	BRL	10.0		µg/L	1	8/25/2003 12:21:48 PM
Copper	BRL	10.0		µg/L	1	8/25/2003 12:21:48 PM
Lead	BRL	10.0		µg/L	1	8/25/2003 12:21:48 PM
Nickel	BRL	20.0		µg/L	1	8/25/2003 12:21:48 PM
Vanadium	BRL	10.0		µg/L	1	8/25/2003 12:21:48 PM
Zinc	BRL	20.0		µg/L	1	8/25/2003 12:21:48 PM
<b>MERCURY, TOTAL</b>		<b>SW7470A</b>		Analyst: JDJ		
Mercury	BRL	0.00050		mg/L	1	8/25/2003
<b>SEMIVOLATILE ORG. COMP. BY GC/MS</b>		<b>SW8270C</b>		Analyst: EP		
Acenaphthene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Acenaphthylene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Anthracene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Benz(a)anthracene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Benzo(a)pyrene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Benzo(b)fluoranthene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Benzo(k)fluoranthene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Chrysene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Fluoranthene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Fluorene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Naphthalene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Phenanthrene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Phenol	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Pyrene	BRL	10		µg/L	1	8/22/2003 11:51:00 PM
Surr: 2,4,6-Tribromophenol	119	37-127		%REC	1	8/22/2003 11:51:00 PM
Surr: 2-Fluorobiphenyl	94.8	43-110		%REC	1	8/22/2003 11:51:00 PM
Surr: 2-Fluorophenol	62.7	13-100		%REC	1	8/22/2003 11:51:00 PM
Surr: 4-Terphenyl-d14	89.4	10-121		%REC	1	8/22/2003 11:51:00 PM
Surr: Nitrobenzene-d5	80.4	40-110		%REC	1	8/22/2003 11:51:00 PM
Surr: Phenol-d5	42.4	10-121		%REC	1	8/22/2003 11:51:00 PM
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>		Analyst: AD		
Benzene	BRL	5.0		µg/L	1	8/22/2003 10:45:00 PM
Carbon disulfide	BRL	5.0		µg/L	1	8/22/2003 10:45:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-004

Client Sample ID: MW-4  
 Collection Date: 8/20/2003 2:15:00 PM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>				Analyst: AD
Ethylbenzene	BRL	5.0		µg/L	1	8/22/2003 10:45:00 PM
Methylene chloride	BRL	5.0		µg/L	1	8/22/2003 10:45:00 PM
Toluene	BRL	5.0		µg/L	1	8/22/2003 10:45:00 PM
Xylenes, Total	BRL	5.0		µg/L	1	8/22/2003 10:45:00 PM
Surr: 4-Bromofluorobenzene	90.0	71.8-143		%REC	1	8/22/2003 10:45:00 PM
Surr: Dibromofluoromethane	91.4	80.3-123		%REC	1	8/22/2003 10:45:00 PM
Surr: Toluene-d8	91.6	70.1-142		%REC	1	8/22/2003 10:45:00 PM
<b>CYANIDE</b>		<b>SW9014</b>				Analyst: VS
Cyanide, Total	BRL	0.010		mg/L	1	8/21/2003 6:20:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-005

Client Sample ID: MW-7  
 Collection Date: 8/21/2003 8:15:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>TOTAL METALS BY ICP/MS</b>						
		<b>SW6020</b>				Analyst: SSS
Arsenic	BRL	20.0		µg/L	1	8/25/2003 12:35:30 PM
Barium	328	20.0		µg/L	1	8/25/2003 12:35:30 PM
Beryllium	BRL	5.00		µg/L	1	8/25/2003 12:35:30 PM
Cadmium	BRL	5.00		µg/L	1	8/25/2003 12:35:30 PM
Chromium	BRL	10.0		µg/L	1	8/25/2003 12:35:30 PM
Copper	BRL	10.0		µg/L	1	8/25/2003 12:35:30 PM
Lead	BRL	10.0		µg/L	1	8/25/2003 12:35:30 PM
Nickel	BRL	20.0		µg/L	1	8/25/2003 12:35:30 PM
Vanadium	BRL	10.0		µg/L	1	8/25/2003 12:35:30 PM
Zinc	BRL	20.0		µg/L	1	8/25/2003 12:35:30 PM
<b>MERCURY, TOTAL</b>						
		<b>SW7470A</b>				Analyst: JDJ
Mercury	BRL	0.00050		mg/L	1	8/25/2003
<b>SEMIVOLATILE ORG. COMP. BY GC/MS</b>						
		<b>SW8270C</b>				Analyst: EP
Acenaphthene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Acenaphthylene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Anthracene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Benz(a)anthracene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Benzo(a)pyrene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Benzo(b)fluoranthene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Benzo(g,h,i)perylene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Benzo(k)fluoranthene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Chrysene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Dibenz(a,h)anthracene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Fluoranthene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Fluorene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Naphthalene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Phenanthrene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Phenol	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Pyrene	BRL	10		µg/L	1	8/23/2003 12:27:00 AM
Surr: 2,4,6-Tribromophenol	105	37-127		%REC	1	8/23/2003 12:27:00 AM
Surr: 2-Fluorobiphenyl	86.5	43-110		%REC	1	8/23/2003 12:27:00 AM
Surr: 2-Fluorophenol	58.8	13-100		%REC	1	8/23/2003 12:27:00 AM
Surr: 4-Terphenyl-d14	83.8	10-121		%REC	1	8/23/2003 12:27:00 AM
Surr: Nitrobenzene-d5	74.0	40-110		%REC	1	8/23/2003 12:27:00 AM
Surr: Phenol-d5	39.0	10-121		%REC	1	8/23/2003 12:27:00 AM
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>						
		<b>SW8260B</b>				Analyst: AD
Benzene	BRL	5.0		µg/L	1	8/22/2003 11:16:00 PM
Carbon disulfide	BRL	5.0		µg/L	1	8/22/2003 11:16:00 PM

Qualifiers:					
*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank		
BRL	Below Reporting Limit	E	Value above quantitation range		
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits		
N	Analyte not NELAC certified	P	NELAC analyte certification pending		
Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits		

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-005

Client Sample ID: MW-7  
 Collection Date: 8/21/2003 8:15:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>				Analyst: AD
Ethylbenzene	BRL	5.0		µg/L	1	8/22/2003 11:16:00 PM
Methylene chloride	BRL	5.0		µg/L	1	8/22/2003 11:16:00 PM
Toluene	BRL	5.0		µg/L	1	8/22/2003 11:16:00 PM
Xylenes, Total	BRL	5.0		µg/L	1	8/22/2003 11:16:00 PM
Surr: 4-Bromofluorobenzene	89.3	71.8-143		%REC	1	8/22/2003 11:16:00 PM
Surr: Dibromofluoromethane	89.7	80.3-123		%REC	1	8/22/2003 11:16:00 PM
Surr: Toluene-d8	90.9	70.1-142		%REC	1	8/22/2003 11:16:00 PM
<b>CYANIDE</b>		<b>SW9014</b>				Analyst: VS
Cyanide, Total	BRL	0.010		mg/L	1	8/21/2003 6:20:00 PM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-006

Client Sample ID: MW-6  
 Collection Date: 8/21/2003 6:50:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>TOTAL METALS BY ICP/MS</b>		<b>SW6020</b>		Analyst: SSS		
Arsenic	BRL	20.0		µg/L	1	8/25/2003 2:02:48 PM
Barium	168	20.0		µg/L	1	8/25/2003 2:02:48 PM
Beryllium	BRL	5.00		µg/L	1	8/25/2003 2:02:48 PM
Cadmium	BRL	5.00		µg/L	1	8/25/2003 2:02:48 PM
Chromium	BRL	10.0		µg/L	1	8/25/2003 2:02:48 PM
Copper	BRL	10.0		µg/L	1	8/25/2003 2:02:48 PM
Lead	BRL	10.0		µg/L	1	8/25/2003 2:02:48 PM
Nickel	BRL	20.0		µg/L	1	8/25/2003 2:02:48 PM
Vanadium	BRL	10.0		µg/L	1	8/25/2003 2:02:48 PM
Zinc	BRL	20.0		µg/L	1	8/25/2003 2:02:48 PM
<b>MERCURY, TOTAL</b>		<b>SW7470A</b>		Analyst: JDJ		
Mercury	BRL	0.00050		mg/L	1	8/25/2003
<b>SEMIVOLATILE ORG. COMP. BY GC/MS</b>		<b>SW8270C</b>		Analyst: EP		
Acenaphthene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Acenaphthylene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Anthracene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Benz(a)anthracene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Benzo(a)pyrene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Benzo(b)fluoranthene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Benzo(g,h,i)perylene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Benzo(k)fluoranthene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Chrysene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Dibenz(a,h)anthracene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Fluoranthene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Fluorene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Naphthalene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Phenanthrene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Phenol	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Pyrene	BRL	10		µg/L	1	8/23/2003 1:03:00 AM
Surr: 2,4,6-Tribromophenol	110	37-127		%REC	1	8/23/2003 1:03:00 AM
Surr: 2-Fluorobiphenyl	84.9	43-110		%REC	1	8/23/2003 1:03:00 AM
Surr: 2-Fluorophenol	58.5	13-100		%REC	1	8/23/2003 1:03:00 AM
Surr: 4-Terphenyl-d14	84.0	10-121		%REC	1	8/23/2003 1:03:00 AM
Surr: Nitrobenzene-d5	74.4	40-110		%REC	1	8/23/2003 1:03:00 AM
Surr: Phenol-d5	39.5	10-121		%REC	1	8/23/2003 1:03:00 AM
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>		Analyst: AD		
Benzene	BRL	5.0		µg/L	1	8/22/2003 11:47:00 PM
Carbon disulfide	BRL	5.0		µg/L	1	8/22/2003 11:47:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-006

Client Sample ID: MW-6  
 Collection Date: 8/21/2003 6:50:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>				Analyst: AD
Ethylbenzene	BRL	5.0		µg/L	1	8/22/2003 11:47:00 PM
Methylene chloride	BRL	5.0		µg/L	1	8/22/2003 11:47:00 PM
Toluene	BRL	5.0		µg/L	1	8/22/2003 11:47:00 PM
Xylenes, Total	BRL	5.0		µg/L	1	8/22/2003 11:47:00 PM
Surr: 4-Bromofluorobenzene	89.2	71.8-143		%REC	1	8/22/2003 11:47:00 PM
Surr: Dibromofluoromethane	99.0	80.3-123		%REC	1	8/22/2003 11:47:00 PM
Surr: Toluene-d8	91.2	70.1-142		%REC	1	8/22/2003 11:47:00 PM
<b>CYANIDE</b>		<b>SW9014</b>				Analyst: VS
Cyanide, Total	BRL	0.010		mg/L	1	8/21/2003 6:20:00 PM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-007

Client Sample ID: MW-1  
 Collection Date: 8/21/2003 8:30:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>TOTAL METALS BY ICP/MS</b>		<b>SW6020</b>		Analyst: SSS		
Arsenic	BRL	20.0		µg/L	1	8/25/2003 2:07:24 PM
Barium	BRL	20.0		µg/L	1	8/25/2003 2:07:24 PM
Beryllium	BRL	5.00		µg/L	1	8/25/2003 2:07:24 PM
Cadmium	BRL	5.00		µg/L	1	8/25/2003 2:07:24 PM
Chromium	BRL	10.0		µg/L	1	8/25/2003 2:07:24 PM
Copper	BRL	10.0		µg/L	1	8/25/2003 2:07:24 PM
Lead	BRL	10.0		µg/L	1	8/25/2003 2:07:24 PM
Nickel	BRL	20.0		µg/L	1	8/25/2003 2:07:24 PM
Vanadium	BRL	10.0		µg/L	1	8/25/2003 2:07:24 PM
Zinc	BRL	20.0		µg/L	1	8/25/2003 2:07:24 PM
<b>MERCURY, TOTAL</b>		<b>SW7470A</b>		Analyst: JDJ		
Mercury	BRL	0.00050		mg/L	1	8/25/2003
<b>SEMIVOLATILE ORG. COMP. BY GC/MS</b>		<b>SW8270C</b>		Analyst: EP		
Acenaphthene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Acenaphthylene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Anthracene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Benz(a)anthracene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Benzo(a)pyrene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Benzo(b)fluoranthene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Benzo(g,h,i)perylene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Benzo(k)fluoranthene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Chrysene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Dibenz(a,h)anthracene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Fluoranthene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Fluorene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Naphthalene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Phenanthrene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Phenol	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Pyrene	BRL	10		µg/L	1	8/23/2003 1:39:00 AM
Surr: 2,4,6-Tribromophenol	117	37-127		%REC	1	8/23/2003 1:39:00 AM
Surr: 2-Fluorobiphenyl	98.1	43-110		%REC	1	8/23/2003 1:39:00 AM
Surr: 2-Fluorophenol	67.3	13-100		%REC	1	8/23/2003 1:39:00 AM
Surr: 4-Terphenyl-d14	86.0	10-121		%REC	1	8/23/2003 1:39:00 AM
Surr: Nitrobenzene-d5	85.4	40-110		%REC	1	8/23/2003 1:39:00 AM
Surr: Phenol-d5	44.0	10-121		%REC	1	8/23/2003 1:39:00 AM
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>		Analyst: NWH		
Benzene	BRL	5.0		µg/L	1	8/25/2003 11:48:00 AM
Carbon disulfide	BRL	5.0		µg/L	1	8/25/2003 11:48:00 AM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc Client Sample ID: MW-1  
 Lab Order: 0308663 Collection Date: 8/21/2003 8:30:00 AM  
 Project: Macon II MGP  
 Lab ID: 0308663-007 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>				Analyst: NWH
Ethylbenzene	BRL	5.0		µg/L	1	8/25/2003 11:48:00 AM
Methylene chloride	BRL	5.0		µg/L	1	8/25/2003 11:48:00 AM
Toluene	BRL	5.0		µg/L	1	8/25/2003 11:48:00 AM
Xylenes, Total	BRL	5.0		µg/L	1	8/25/2003 11:48:00 AM
Surr: 4-Bromofluorobenzene	85.8	71.8-143		%REC	1	8/25/2003 11:48:00 AM
Surr: Dibromofluoromethane	95.1	80.3-123		%REC	1	8/25/2003 11:48:00 AM
Surr: Toluene-d8	96.4	70.1-142		%REC	1	8/25/2003 11:48:00 AM
<b>CYANIDE</b>		<b>SW9014</b>				Analyst: VS
Cyanide, Total	BRL	0.010		mg/L	1	8/21/2003 6:20:00 PM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

Analytical Environmental Servs, Inc.

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-008

Client Sample ID: DUP082003  
 Collection Date: 8/20/2003  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>TOTAL METALS BY ICP/MS</b>		<b>SW6020</b>		Analyst: SSS		
Arsenic	BRL	20.0		µg/L	1	8/25/2003 2:11:58 PM
Barium	692	20.0		µg/L	1	8/25/2003 2:11:58 PM
Beryllium	BRL	5.00		µg/L	1	8/25/2003 2:11:58 PM
Cadmium	BRL	5.00		µg/L	1	8/25/2003 2:11:58 PM
Chromium	BRL	10.0		µg/L	1	8/25/2003 2:11:58 PM
Copper	BRL	10.0		µg/L	1	8/25/2003 2:11:58 PM
Lead	BRL	10.0		µg/L	1	8/25/2003 2:11:58 PM
Nickel	BRL	20.0		µg/L	1	8/25/2003 2:11:58 PM
Vanadium	BRL	10.0		µg/L	1	8/25/2003 2:11:58 PM
Zinc	BRL	20.0		µg/L	1	8/25/2003 2:11:58 PM
<b>MERCURY, TOTAL</b>		<b>SW7470A</b>		Analyst: JDJ		
Mercury	BRL	0.00050		mg/L	1	8/25/2003
<b>SEMIVOLATILE ORG. COMP. BY GC/MS</b>		<b>SW8270C</b>		Analyst: YH		
Acenaphthene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Acenaphthylene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Anthracene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Benz(a)anthracene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Benzo(a)pyrene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Benzo(b)fluoranthene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Benzo(k)fluoranthene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Chrysene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Fluoranthene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Fluorene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Naphthalene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Phenanthrene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Phenol	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Pyrene	BRL	10		µg/L	1	8/25/2003 2:00:00 PM
Surr: 2,4,6-Tribromophenol	107	37-127		%REC	1	8/25/2003 2:00:00 PM
Surr: 2-Fluorobiphenyl	92.6	43-110		%REC	1	8/25/2003 2:00:00 PM
Surr: 2-Fluorophenol	71.8	13-100		%REC	1	8/25/2003 2:00:00 PM
Surr: 4-Terphenyl-d14	98.4	10-121		%REC	1	8/25/2003 2:00:00 PM
Surr: Nitrobenzene-d5	88.6	40-110		%REC	1	8/25/2003 2:00:00 PM
Surr: Phenol-d5	52.0	10-121		%REC	1	8/25/2003 2:00:00 PM
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>		Analyst: NWH		
Benzene	BRL	5.0		µg/L	1	8/25/2003 1:11:00 PM
Carbon disulfide	BRL	5.0		µg/L	1	8/25/2003 1:11:00 PM

Qualifiers:	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-008

Client Sample ID: DUP082003  
 Collection Date: 8/20/2003

Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>				Analyst: NWH
Ethylbenzene	BRL	5.0		µg/L	1	8/25/2003 1:11:00 PM
Methylene chloride	BRL	5.0		µg/L	1	8/25/2003 1:11:00 PM
Toluene	BRL	5.0		µg/L	1	8/25/2003 1:11:00 PM
Xylenes, Total	BRL	5.0		µg/L	1	8/25/2003 1:11:00 PM
Surr: 4-Bromofluorobenzene	85.7	71.8-143		%REC	1	8/25/2003 1:11:00 PM
Surr: Dibromofluoromethane	96.4	80.3-123		%REC	1	8/25/2003 1:11:00 PM
Surr: Toluene-d8	100	70.1-142		%REC	1	8/25/2003 1:11:00 PM
<b>CYANIDE</b>		<b>SW9014</b>				Analyst: VS
Cyanide, Total	BRL	0.010		mg/L	1	8/21/2003 6:20:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-009

Client Sample ID: RB082103  
 Collection Date: 8/21/2003 10:00:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>TOTAL METALS BY ICP/MS</b>		<b>SW6020</b>		Analyst: SSS		
Arsenic	BRL	20.0		µg/L	1	8/25/2003 2:16:29 PM
Barium	BRL	20.0		µg/L	1	8/25/2003 2:16:29 PM
Beryllium	BRL	5.00		µg/L	1	8/25/2003 2:16:29 PM
Cadmium	BRL	5.00		µg/L	1	8/25/2003 2:16:29 PM
Chromium	BRL	10.0		µg/L	1	8/25/2003 2:16:29 PM
Copper	BRL	10.0		µg/L	1	8/25/2003 2:16:29 PM
Lead	BRL	10.0		µg/L	1	8/25/2003 2:16:29 PM
Nickel	BRL	20.0		µg/L	1	8/25/2003 2:16:29 PM
Vanadium	BRL	10.0		µg/L	1	8/25/2003 2:16:29 PM
Zinc	BRL	20.0		µg/L	1	8/25/2003 2:16:29 PM
<b>MERCURY, TOTAL</b>		<b>SW7470A</b>		Analyst: JDJ		
Mercury	BRL	0.00050		mg/L	1	8/25/2003
<b>SEMIVOLATILE ORG. COMP. BY GC/MS</b>		<b>SW8270C</b>		Analyst: YH		
Acenaphthene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Acenaphthylene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Anthracene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Benz(a)anthracene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Benzo(a)pyrene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Benzo(b)fluoranthene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Benzo(g,h,i)perylene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Benzo(k)fluoranthene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Chrysene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Dibenz(a,h)anthracene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Fluoranthene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Fluorene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Indeno(1,2,3-cd)pyrene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Naphthalene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Phenanthrene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Phenol	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Pyrene	BRL	10		µg/L	1	8/25/2003 2:38:00 PM
Surr: 2,4,6-Tribromophenol	91.8	37-127		%REC	1	8/25/2003 2:38:00 PM
Surr: 2-Fluorobiphenyl	86.9	43-110		%REC	1	8/25/2003 2:38:00 PM
Surr: 2-Fluorophenol	64.5	13-100		%REC	1	8/25/2003 2:38:00 PM
Surr: 4-Terphenyl-d14	97.0	10-121		%REC	1	8/25/2003 2:38:00 PM
Surr: Nitrobenzene-d5	84.1	40-110		%REC	1	8/25/2003 2:38:00 PM
Surr: Phenol-d5	42.8	10-121		%REC	1	8/25/2003 2:38:00 PM
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>		Analyst: AD		
Benzene	BRL	5.0		µg/L	1	8/22/2003 8:09:00 PM
Carbon disulfide	BRL	5.0		µg/L	1	8/22/2003 8:09:00 PM

Qualifiers: \* Value exceeds Maximum Contaminant Level B Analyte detected in the associated Method Blank  
 BRL Below Reporting Limit E Value above quantitation range  
 H Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits  
 N Analyte not NELAC certified P NELAC analyte certification pending  
 Rpt Limit Reporting Limit S Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc.  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-009

Client Sample ID: RB082103  
 Collection Date: 8/21/2003 10:00:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>				Analyst: AD
Ethylbenzene	BRL	5.0		µg/L	1	8/22/2003 8:09:00 PM
Methylene chloride	BRL	5.0		µg/L	1	8/22/2003 8:09:00 PM
Toluene	BRL	5.0		µg/L	1	8/22/2003 8:09:00 PM
Xylenes, Total	BRL	5.0		µg/L	1	8/22/2003 8:09:00 PM
Surr: 4-Bromofluorobenzene	89.7	71.8-143		%REC	1	8/22/2003 8:09:00 PM
Surr: Dibromofluoromethane	92.3	80.3-123		%REC	1	8/22/2003 8:09:00 PM
Surr: Toluene-d8	88.8	70.1-142		%REC	1	8/22/2003 8:09:00 PM
<b>CYANIDE</b>		<b>SW9014</b>				Analyst: VS
Cyanide, Total	BRL	0.010		mg/L	1	8/21/2003 6:20:00 PM

**Qualifiers:**

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
BRL	Below Reporting Limit	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
N	Analyte not NELAC certified	P	NELAC analyte certification pending
Rpt-Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

**Analytical Environmental Servs, Inc.**

Date: 27-Aug-03

CLIENT: Williams Environmental Services, Inc.  
 Lab Order: 0308663  
 Project: Macon II MGP  
 Lab ID: 0308663-010

Client Sample ID: TB082103  
 Collection Date: 8/21/2003 10:05:00 AM  
 Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
<b>VOLATILE ORGANIC COMPOUNDS BY GC/MS</b>		<b>SW8260B</b>				Analyst: AD
Benzene	BRL	5.0		µg/L	1	8/22/2003 8:40:00 PM
Carbon disulfide	BRL	5.0		µg/L	1	8/22/2003 8:40:00 PM
Ethylbenzene	BRL	5.0		µg/L	1	8/22/2003 8:40:00 PM
Methylene chloride	BRL	5.0		µg/L	1	8/22/2003 8:40:00 PM
Toluene	BRL	5.0		µg/L	1	8/22/2003 8:40:00 PM
Xylenes, Total	BRL	5.0		µg/L	1	8/22/2003 8:40:00 PM
Surr: 4-Bromofluorobenzene	87.0	71.8-143		%REC	1	8/22/2003 8:40:00 PM
Surr: Dibromofluoromethane	94.7	80.3-123		%REC	1	8/22/2003 8:40:00 PM
Surr: Toluene-d8	91.9	70.1-142		%REC	1	8/22/2003 8:40:00 PM

<b>Qualifiers:</b>	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	BRL	Below Reporting Limit	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	N	Analyte not NELAC certified	P	NELAC analyte certification pending
	Rpt Limit	Reporting Limit	S	Spike Recovery outside accepted recovery limits

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client WEST

Work Order Number 0308663

Checklist completed by Nyame Osborn 8/21/03  
Signature Date

Carrier name: FedEx  UPS  Courier  Client  US Mail  Other

Shipping container/cooler in good condition? Yes  No  Not Present

Custody seals intact on shipping container/cooler? Yes  No  Not Present

Custody seals intact on sample bottles? Yes  No  Not Present

Container/Temp Blank temperature in compliance? Yes  No

Cooler #1 5.2°c Cooler #2 4.8°c Cooler #3 5.5°c Cooler #4 \_\_\_\_\_ Cooler#5 \_\_\_\_\_ Cooler #6 \_\_\_\_\_

Chain of custody present? Yes  No

Chain of custody signed when relinquished and received? Yes  No

Chain of custody agrees with sample labels? Yes  No

Samples in proper container/bottle? Yes  No

Sample containers intact? Yes  No

Sufficient sample volume for indicated test? Yes  No

All samples received within holding time? Yes  No

Was TAT marked on the COC? Yes  No

Proceed with Standard TAT as per project history? Yes  No  Not Applicable

Water - VOA vials have zero headspace? No VOA vials submitted  Yes  No

Water - pH acceptable upon receipt? Yes  No  Not Applicable

Adjusted? \_\_\_\_\_ Checked by N.O.

Case Narrative for resolution of the Non-Conformance.

**CLIENT:** Williams Environmental Services, Inc  
**Project:** Macon II MGP  
**Lab Order:** 0308663

**CASE NARRATIVE**

Metals Analysis by Method 6020B:

Zn was detected in Method Blank 37318 at 23µg/l which was above reporting limit of 20µg/l resulting in "B" qualified data. Associated sample values were greater than approximately 10X the blank value or less than reporting limit and data was not affected.

LCS-37318 is flagged For Zn due to the hit in the method blank.

Analytic Environmental Servs, Inc.

Date: 28-Aug-03

CLIENT: Williams Environmental Services, Inc  
 Work Order: 0308663  
 Project: Macon II MGP

ANALYTICAL QC SUMMARY REPORT

BatchID: 37280

Sample ID: MB-37280	SampType: MBLK	TestCode: 8260_TCL_W	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41772
Client ID:	Batch ID: 37280	TestNo: SW8260B		Analysis Date: 8/21/2003	SeqNo: 759657

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	BRL	5.0									
Carbon disulfide	BRL	5.0									
Ethylbenzene	BRL	5.0									
Methylene chloride	BRL	5.0									
Toluene	BRL	5.0									
Xylenes, Total	BRL	5.0									
Surr: 4-Bromofluorobenzene	48.99	0	50	0	98	71.8	143	0	0		
Surr: Dibromofluoromethane	57.34	0	50	0	115	80.3	123	0	0		
Surr: Toluene-d8	52.42	0	50	0	105	70.1	142	0	0		

Sample ID: MB-37280	SampType: MBLK	TestCode: 8260B_W	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41762
Client ID:	Batch ID: 37280	TestNo: SW8260B		Analysis Date: 8/20/2003	SeqNo: 759401

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	BRL	5.0									
Carbon disulfide	BRL	5.0									
Ethylbenzene	BRL	5.0									
Methylene chloride	BRL	5.0									
Toluene	BRL	5.0									
Xylenes, Total	BRL	5.0									
Surr: 4-Bromofluorobenzene	47.64	0	50	0	95.3	71.8	143	0	0		
Surr: Dibromofluoromethane	57.18	0	50	0	114	80.3	123	0	0		
Surr: Toluene-d8	53.72	0	50	0	107	70.1	142	0	0		

Sample ID: LCS-37280	SampType: LCS	TestCode: 8260B_W	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41762
Client ID:	Batch ID: 37280	TestNo: SW8260B		Analysis Date: 8/20/2003	SeqNo: 759402

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	50.06	5.0	50	0	100	71.1	120	0	0		

Qualifiers: B Analyte detected in the associated Method Blank BRL Below Reporting Limit E Value above quantitation range  
 H Holding times for preparation or analysis exceeded J Analyte detected below quantitation limits N Analyte not NELAC certified  
 R RPD outside accepted recovery limits S Spike Recovery outside accepted recovery limits

CLIENT: Williams Environmental Services, Inc  
 Work Order: 0308663  
 Project: Macon II MGP

# ANALYTICAL QC SUMMARY REPORT

BatchID: 37280

Sample ID: LCS-37280	SampType: LCS	TestCode: 8260B_W	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41762
Client ID:	Batch ID: 37280	TestNo: SW8260B		Analysis Date: 8/20/2003	SeqNo: 759402

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	51.32	5.0	50	0	103	84	124	0	0	0	
Surr: 4-Bromofluorobenzene	47.87	5.0	50	0	95.7	71.8	143	0	0	0	
Surr: Dibromofluoromethane	54.15	5.0	50	0	108	80.3	123	0	0	0	
Surr: Toluene-d8	51.32	5.0	50	0	103	70.1	142	0	0	0	

Sample ID: 0308573-016AMS	SampType: MS	TestCode: 8260B_W	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41934
Client ID:	Batch ID: 37280	TestNo: SW8260B		Analysis Date: 8/26/2003	SeqNo: 764647

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	45.94	5.0	50	0	91.9	75	130	0	0	0	
Toluene	48.37	5.0	50	0	96.7	79	125	0	0	0	
Surr: 4-Bromofluorobenzene	43.22	5.0	50	0	86.4	71.8	143	0	0	0	
Surr: Dibromofluoromethane	44.98	5.0	50	0	90	80.3	123	0	0	0	
Surr: Toluene-d8	47.81	5.0	50	0	95.6	70.1	142	0	0	0	

Sample ID: 0308573-016AMSD	SampType: MSD	TestCode: 8260B_W	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41934
Client ID:	Batch ID: 37280	TestNo: SW8260B		Analysis Date: 8/26/2003	SeqNo: 764649

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	44.57	5.0	50	0	89.1	75	130	45.94	3.03	30	
Toluene	46.4	5.0	50	0	92.8	79	125	48.37	4.16	30	
Surr: 4-Bromofluorobenzene	43.51	5.0	50	0	87	71.8	143	43.22	0	0	
Surr: Dibromofluoromethane	45.62	5.0	50	0	91.2	80.3	123	44.98	0	0	
Surr: Toluene-d8	48.35	5.0	50	0	96.7	70.1	142	47.81	0	0	

Sample ID: MB-37280	SampType: MBLK	TestCode: 8260B_W_CL	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41751
Client ID:	Batch ID: 37280	TestNo: SW8260B		Analysis Date: 8/20/2003	SeqNo: 759216

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	BRL										

Qualifiers: B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits  
 BRL Below Reporting Limit  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits  
 E Value above quantitation range  
 N Analyte not NELAC certified

CLIENT: Williams Environmental Services, Inc  
 Work Order: 0308663  
 Project: Macon II MGP

# ANALYTICAL QC SUMMARY REPORT

BatchID: 37280

Sample ID: MB-37280	SampType: MBLK	TestCode: 8260B_W_CL	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41751						
Client ID:	Batch ID: 37280	TestNo: SW8260B		Analysis Date: 8/20/2003	SeqNo: 759216						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Carbon disulfide	BRL	5.0									
Ethylbenzene	BRL	5.0									
Methylene chloride	BRL	5.0									
Toluene	BRL	5.0									
Xylenes, Total	BRL	5.0									
Surr: 4-Bromofluorobenzene	47.64	0	50	0	95.3	71.8	143	0	0	0	
Surr: Dibromofluoromethane	57.18	0	50	0	114	80.3	123	0	0	0	
Surr: Toluene-d8	53.72	0	50	0	107	70.1	142	0	0	0	

Sample ID: LCS-37280	SampType: LCS	TestCode: 8260B_W_CL	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41751						
Client ID:	Batch ID: 37280	TestNo: SW8260B		Analysis Date: 8/20/2003	SeqNo: 759217						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	50.06	5.0	50	0	100	71.1	120	0	0	0	
Toluene	51.32	5.0	50	0	103	84	124	0	0	0	
Surr: 4-Bromofluorobenzene	47.87	0	50	0	95.7	71.8	143	0	0	0	
Surr: Dibromofluoromethane	54.15	0	50	0	108	80.3	123	0	0	0	
Surr: Toluene-d8	51.32	0	50	0	103	70.1	142	0	0	0	

**Qualifiers:**

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- R RPD outside accepted recovery limits
- BRL Below Reporting Limit
- J Analyte detected below quantitation limits
- S Spike Recovery outside accepted recovery limits
- E Value above quantitation range
- N Analyte not NELAC certified

CLIENT: Williams Environmental Services, Inc  
 Work Order: 0308663  
 Project: Macon II MGP

**ANALYTICAL QC SUMMARY REPORT**

BatchID: 37292

Sample ID: MB-37292	Sample Type: MBLK	TestCode: 8270_A2_W	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41884
Client ID:	Batch ID: 37292	TestNo: SW8270C		Analysis Date: 8/22/2003	SeqNo: 762476

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	BRL	10									
Acenaphthylene	BRL	10									
Anthracene	BRL	10									
Benz(a)anthracene	BRL	10									
Benzo(a)pyrene	BRL	10									
Benzo(b)fluoranthene	BRL	10									
Benzo(g,h,i)perylene	BRL	10									
Benzo(k)fluoranthene	BRL	10									
Chrysene	BRL	10									
Dibenz(a,h)anthracene	BRL	10									
Fluoranthene	BRL	10									
Fluorene	BRL	10									
Indeno(1,2,3-cd)pyrene	BRL	10									
Naphthalene	BRL	10									
Phenanthrene	BRL	10									
Phenol	BRL	10									
Pyrene	BRL	10									
Surr: 2,4,6-Tribromophenol	98.68	0	100	0	98.7	19	124	0	0	0	
Surr: 2-Fluorobiphenyl	47.61	0	50	0	95.2	26	115	0	0	0	
Surr: 2-Fluorophenol	92.27	0	100	0	92.3	10	121	0	0	0	
Surr: 4-Terphenyl-d14	49.27	0	50	0	98.5	18	137	0	0	0	
Surr: Nitrobenzene-d5	47.42	0	50	0	94.8	15	120	0	0	0	
Surr: Phenol-d5	69.67	0	100	0	69.7	18	113	0	0	0	

Sample ID: LCS-37292	Sample Type: LCS	TestCode: 8270_A2_W	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41884
Client ID:	Batch ID: 37292	TestNo: SW8270C		Analysis Date: 8/22/2003	SeqNo: 762477

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	85.07	10	100	0	85.1	47	145	0	0	0	
Phenol	66.02	10	100	0	66	5	112	0	0	0	
Pyrene	97.49	10	100	0	97.5	52	115	0	0	0	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits  
 BRL Below Reporting Limit  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits  
 E Value above quantitation range  
 N Analyte not NELAC certified

CLIENT: Williams Environmental Services, Inc  
 Work Order: 0308663  
 Project: Macon II MGP

# ANALYTICAL QC SUMMARY REPORT

BatchID: 37292

Sample ID: LCS-37292	SampType: LCS	TestCode: 8270_A2_W	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41884
Client ID:	Batch ID: 37292	TestNo: SW8270C		Analysis Date: 8/22/2003	SeqNo: 762477

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 2,4,6-Tribromophenol	98.58	0	100	0	98.6	19	124	0	0	0	0
Surr: 2-Fluorobiphenyl	43.48	0	50	0	87	26	115	0	0	0	0
Surr: 2-Fluorophenol	83.96	0	100	0	84	10	121	0	0	0	0
Surr: 4-Terphenyl-d14	48.94	0	50	0	97.9	18	137	0	0	0	0
Surr: Nitrobenzene-d5	40.59	0	50	0	81.2	15	120	0	0	0	0
Surr: Phenol-d5	72.88	0	100	0	72.9	18	113	0	0	0	0

Sample ID: 0308605-001AMS	SampType: MS	TestCode: 8270_A2_W	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41884
Client ID:	Batch ID: 37292	TestNo: SW8270C		Analysis Date: 8/22/2003	SeqNo: 762479

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	79.45	10	100	0	79.4	47	145	0	0	0	0
Phenol	56.12	10	100	0	56.1	5	112	0	0	0	0
Pyrene	85.02	10	100	0	85	52	115	0	0	0	0
Surr: 2,4,6-Tribromophenol	94.98	0	100	0	95	19	124	0	0	0	0
Surr: 2-Fluorobiphenyl	40.05	0	50	0	80.1	26	115	0	0	0	0
Surr: 2-Fluorophenol	71.33	0	100	0	71.3	10	121	0	0	0	0
Surr: 4-Terphenyl-d14	42.67	0	50	0	85.3	18	137	0	0	0	0
Surr: Nitrobenzene-d5	38.17	0	50	0	76.3	15	120	0	0	0	0
Surr: Phenol-d5	60.84	0	100	0	60.8	18	113	0	0	0	0

Sample ID: 0308605-001AMSD	SampType: MSD	TestCode: 8270_A2_W	Units: µg/L	Prep Date: 8/21/2003	RunNo: 41884
Client ID:	Batch ID: 37292	TestNo: SW8270C		Analysis Date: 8/22/2003	SeqNo: 762480

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	85.02	10	100	0	85	47	145	79.45	6.77	0	0
Phenol	60.89	10	100	0	60.9	5	112	56.12	8.15	0	0
Pyrene	90.53	10	100	0	90.5	52	115	85.02	6.28	0	0
Surr: 2,4,6-Tribromophenol	94.16	0	100	0	94.2	19	124	94.98	0	0	0
Surr: 2-Fluorobiphenyl	40.28	0	50	0	80.6	26	115	40.05	0	0	0
Surr: 2-Fluorophenol	74.29	0	100	0	74.3	10	121	71.33	0	0	0

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits  
 S Spike Recovery outside accepted recovery limits  
 J Analyte detected below quantitation limits  
 N Analyte not NELAC certified  
 E Value above quantitation range

**CLIENT:** Williams Environmental Services, Inc  
**Work Order:** 0308663  
**Project:** Macon II MGP

# ANALYTICAL QC SUMMARY REPORT

**BatchID:** 37292

**Sample ID:** 0308605-001AMSD    **SampType:** MSD    **TestCode:** 8270\_A2\_W    **Units:** µg/L    **Prep Date:** 8/21/2003    **RunNo:** 41884  
**Client ID:**    **Batch ID:** 37292    **TestNo:** SW8270C    **Analysis Date:** 8/22/2003    **SeqNo:** 762480

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	43.23	0	50	0	86.5	18	137	42.67	0	0	0
Surr: Nitrobenzene-d5	38.16	0	50	0	76.3	15	120	38.17	0	0	0
Surr: Phenol-d5	63.7	0	100	0	63.7	18	113	60.84	0	0	0

**Qualifiers:** B Analyte detected in the associated Method Blank    BRL Below Reporting Limit    E Value above quantitation range  
 H Holding times for preparation or analysis exceeded    J Analyte detected below quantitation limits    N Analyte not NELAC certified  
 R RPD outside accepted recovery limits    S Spike Recovery outside accepted recovery limits

CLIENT: Williams Environmental Services, Inc  
 Work Order: 0308663  
 Project: Macon II MGP

# ANALYTICAL QC SUMMARY REPORT

BatchID: 37318

Sample ID: MB-37318	SampType: MBLK	TestCode: 6020_W	Units: µg/L	Prep Date: 8/22/2003	RunNo: 41893						
Client ID:	Batch ID: 37318	TestNo: SW6020		Analysis Date: 8/25/2003	SeqNo: 762671						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	BRL	20.0									
Barium	BRL	20.0									
Beryllium	BRL	5.00									
Cadmium	BRL	5.00									
Chromium	BRL	10.0									
Copper	BRL	10.0									
Lead	BRL	10.0									
Nickel	BRL	20.0									
Vanadium	BRL	10.0									
Zinc	30.67	20.0									

Sample ID: LCS-37318	SampType: LCS	TestCode: 6020_W	Units: µg/L	Prep Date: 8/22/2003	RunNo: 41893						
Client ID:	Batch ID: 37318	TestNo: SW6020		Analysis Date: 8/25/2003	SeqNo: 762672						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	97.27	20.0	100	0.858	96.4	85	115	0	0		
Barium	105.5	20.0	100	0.18	105	85	115	0	0		
Beryllium	107.3	5.00	100	0	107	85	115	0	0		
Cadmium	108.9	5.00	100	0	109	85	115	0	0		
Chromium	105.5	10.0	100	0	106	85	115	0	0		
Copper	107.3	10.0	100	0.642	107	85	115	0	0		
Lead	105.1	10.0	100	0.26	105	85	115	0	0		
Nickel	107.5	20.0	100	0	108	85	115	0	0		
Vanadium	104.8	10.0	100	0	105	85	115	0	0		
Zinc	112.7	20.0	100	30.67	82	85	115	0	0		S

Sample ID: 0308663-001DMS	SampType: MS	TestCode: 6020_W	Units: µg/L	Prep Date: 8/22/2003	RunNo: 41893						
Client ID: MW-5	Batch ID: 37318	TestNo: SW6020		Analysis Date: 8/25/2003	SeqNo: 762675						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	105.5	20.0	100	4.477	101	70	130	0	0		
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**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits  
 S Spike Recovery outside accepted recovery limits  
 J Analyte detected below quantitation limits  
 N Analyte not NELAC certified  
 E Value above quantitation range

**CLIENT:** Williams Environmental Services, Inc  
**Work Order:** 0308663  
**Project:** Macon II MGP

# ANALYTICAL QC SUMMARY REPORT

**BatchID: 37318**

Sample ID: 0308663-001DMS	SampType: MS	TestCode: 6020_W	Units: µg/L	Prep Date: 8/22/2003	RunNo: 41893						
Client ID: MW-5	Batch ID: 37318	TestNo: SW6020		Analysis Date: 8/25/2003	SeqNo: 762675						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium	103.8	5.00	100	0	104	70	130	0	0	0	
Cadmium	104.4	5.00	100	0.419	104	70	130	0	0	0	
Chromium	103.8	10.0	100	0	104	70	130	0	0	0	
Copper	99.78	10.0	100	1.004	98.8	70	130	0	0	0	
Lead	111	10.0	100	0.918	110	70	130	0	0	0	
Nickel	101	20.0	100	0.619	100	70	130	0	0	0	
Vanadium	105.9	10.0	100	0.164	106	70	130	0	0	0	
Zinc	103.7	20.0	100	23.22	80.5	70	130	0	0	0	B

Sample ID: 0308663-001DDUP	SampType: DUP	TestCode: 6020_W	Units: µg/L	Prep Date: 8/22/2003	RunNo: 41893						
Client ID: MW-5	Batch ID: 37318	TestNo: SW6020		Analysis Date: 8/25/2003	SeqNo: 762674						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	BRL	20.0	0	0	0	0	0	4.477	0	20	
Beryllium	BRL	5.00	0	0	0	0	0	0	0	20	
Cadmium	BRL	5.00	0	0	0	0	0	0.419	0	20	
Chromium	BRL	10.0	0	0	0	0	0	0	0	20	
Copper	BRL	10.0	0	0	0	0	0	1.004	0	20	
Lead	BRL	10.0	0	0	0	0	0	0.918	0	20	
Nickel	BRL	20.0	0	0	0	0	0	0.619	0	20	
Vanadium	BRL	10.0	0	0	0	0	0	0.164	0	20	
Zinc	BRL	20.0	0	0	0	0	0	23.22	0	20	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits  
 BRL Below Reporting Limit  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits  
 E Value above quantitation range  
 N Analyte not NELAC certified

**CLIENT:** Williams Environmental Services, Inc  
**Work Order:** 0308663  
**Project:** Macon II MGP

# ANALYTICAL QC SUMMARY REPORT

**BatchID:** 37320

Sample ID: MB-37320	SampType: MBLK	TestCode: 9014_W	Units: mg/L	Prep Date: 8/21/2003	RunNo: 41809						
Client ID:	Batch ID: 37320	TestNo: SW9014		Analysis Date: 8/21/2003	SeqNo: 760439						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	BRL	0.0100	0	0	0	0	0	0	0	0	0

Sample ID: LCS-37320	SampType: LCS	TestCode: 9014_W	Units: mg/L	Prep Date: 8/21/2003	RunNo: 41809						
Client ID:	Batch ID: 37320	TestNo: SW9014		Analysis Date: 8/21/2003	SeqNo: 760440						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.2469	0.0100	0.25	0	98.8	85	115	0	0	0	0

Sample ID: 0308663-009C MS	SampType: MS	TestCode: 9014_W	Units: mg/L	Prep Date: 8/21/2003	RunNo: 41809						
Client ID: RB082103	Batch ID: 37320	TestNo: SW9014		Analysis Date: 8/21/2003	SeqNo: 760451						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.2369	0.0100	0.25	0	94.8	70	130	0	0	0	0

Sample ID: 0308663-009C DUP	SampType: DUP	TestCode: 9014_W	Units: mg/L	Prep Date: 8/21/2003	RunNo: 41809						
Client ID: RB082103	Batch ID: 37320	TestNo: SW9014		Analysis Date: 8/21/2003	SeqNo: 760450						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	BRL	0.0100	0	0	0	0	0	0	0	0	20

**Qualifiers:** B Analyte detected in the associated Method Blank      BRL Below Reporting Limit      E Value above quantitation range  
 H Holding times for preparation or analysis exceeded      J Analyte detected below quantitation limits      N Analyte not NELAC certified  
 R RPD outside accepted recovery limits      S Spike Recovery outside accepted recovery limits

CLIENT: Williams Environmental Services, Inc  
 Work Order: 0308663  
 Project: Macon II MGP

# ANALYTICAL QC SUMMARY REPORT

BatchID: 37326

Sample ID: 0308631-013CPDS	SampType: PDS	TestCode: 7470A_W_T	Units: mg/L	Prep Date: 8/25/2003	RunNo: 41912						
Client ID:	Batch ID: 37326	TestNo: SW7470A		Analysis Date: 8/25/2003	SeqNo: 763544						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.01258	0.000320	0.0125	0	101	85	115	0	0	0	

Sample ID: MB-37326	SampType: MBLK	TestCode: 7470A_W_T	Units: mg/L	Prep Date: 8/22/2003	RunNo: 41912						
Client ID:	Batch ID: 37326	TestNo: SW7470A		Analysis Date: 8/25/2003	SeqNo: 763538						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	BRL	0.000160									

Sample ID: LCS-37326	SampType: LCS	TestCode: 7470A_W_T	Units: mg/L	Prep Date: 8/22/2003	RunNo: 41912						
Client ID:	Batch ID: 37326	TestNo: SW7470A		Analysis Date: 8/25/2003	SeqNo: 763539						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.005488	0.000170	0.005	0	110	85	115	0	0	0	

Sample ID: 0308631-013CMS	SampType: MS	TestCode: 7470A_W_T	Units: mg/L	Prep Date: 8/25/2003	RunNo: 41912						
Client ID:	Batch ID: 37326	TestNo: SW7470A		Analysis Date: 8/25/2003	SeqNo: 763542						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.005072	0.000160	0.005	0	101	70	130	0	0	0	

Sample ID: 0308631-013CMSD	SampType: MSD	TestCode: 7470A_W_T	Units: mg/L	Prep Date: 8/25/2003	RunNo: 41912						
Client ID:	Batch ID: 37326	TestNo: SW7470A		Analysis Date: 8/25/2003	SeqNo: 763543						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.00503	0.000160	0.005	0	101	70	130	0.005072	0.841	20	

**Qualifiers:** B Analyte detected in the associated Method Blank      BRL Below Reporting Limit      E Value above quantitation range  
 H Holding times for preparation or analysis exceeded      J Analyte detected below quantitation limits      N Analyte not NELAC certified  
 R RPD outside accepted recovery limits      S Spike Recovery outside accepted recovery limits

CLIENT: Williams Environmental Services, Inc  
 Work Order: 0308663  
 Project: Macon II MGP

# ANALYTICAL QC SUMMARY REPORT

BatchID: 37356

Sample ID: MB-37356	SampType: MBLK	TestCode: 8260B_W	Units: µg/L	Prep Date: 8/23/2003	RunNo: 41898						
Client ID:	Batch ID: 37356	TestNo: SW8260B		Analysis Date: 8/25/2003	SeqNo: 762844						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzene	BRL	5.0									
Carbon disulfide	BRL	5.0									
Ethylbenzene	BRL	5.0									
Methylene chloride	BRL	5.0									
Toluene	BRL	5.0									
Xylenes, Total	BRL	5.0									
Surr: 4-Bromofluorobenzene	42.94	5.0	50	0	85.9	71.8	143	0	0	0	
Surr: Dibromofluoromethane	48.34	5.0	50	0	96.7	80.3	123	0	0	0	
Surr: Toluene-d8	49.09	5.0	50	0	98.2	70.1	142	0	0	0	

Sample ID: LCS-37356	SampType: LCS	TestCode: 8260B_W	Units: µg/L	Prep Date: 8/23/2003	RunNo: 41898						
Client ID:	Batch ID: 37356	TestNo: SW8260B		Analysis Date: 8/25/2003	SeqNo: 762845						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzene	46.71	5.0	50	0	93.4	71.1	120	0	0	0	
Toluene	42.67	5.0	50	0	85.3	84	124	0	0	0	
Surr: 4-Bromofluorobenzene	42.27	5.0	50	0	84.5	71.8	143	0	0	0	
Surr: Dibromofluoromethane	45.31	5.0	50	0	90.6	80.3	123	0	0	0	
Surr: Toluene-d8	42.87	5.0	50	0	85.7	70.1	142	0	0	0	

Sample ID: 0308663-007AMS	SampType: MS	TestCode: 8260B_W	Units: µg/L	Prep Date: 8/23/2003	RunNo: 41898						
Client ID: MW-1	Batch ID: 37356	TestNo: SW8260B		Analysis Date: 8/25/2003	SeqNo: 763261						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzene	44.96	5.0	50	0	89.9	75	130	0	0	0	
Toluene	46.47	5.0	50	0	92.9	79	125	0	0	0	
Surr: 4-Bromofluorobenzene	41.73	5.0	50	0	83.5	71.8	143	0	0	0	
Surr: Dibromofluoromethane	50.29	5.0	50	0	101	80.3	123	0	0	0	
Surr: Toluene-d8	48.65	5.0	50	0	97.3	70.1	142	0	0	0	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits  
 BRL Below Reporting Limit  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits  
 E Value above quantitation range  
 N Analyte not NELAC certified

CLIENT: Williams Environmental Services, Inc  
 Work Order: 0308663  
 Project: Macon II MGP

# ANALYTICAL QC SUMMARY REPORT

BatchID: 37356

Sample ID: 0308663-007AMSD	SampType: MSD	TestCode: 8260B_W	Units: µg/L	Prep Date: 8/23/2003	RunNo: 41898						
Client ID: MW-1	Batch ID: 37356	TestNo: SW8260B		Analysis Date: 8/25/2003	SeqNo: 763264						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	43.59	5.0	50	0	87.2	75	130	44.96	3.09	30	
Toluene	45.1	5.0	50	0	90.2	79	125	46.47	2.99	30	
Surr: 4-Bromofluorobenzene	41.32	5.0	50	0	82.6	71.8	143	41.73	0	0	
Surr: Dibromofluoromethane	44.54	5.0	50	0	89.1	80.3	123	50.29	0	0	
Surr: Toluene-d8	47.23	5.0	50	0	94.5	70.1	142	48.65	0	0	

Sample ID: MB-37356	SampType: MBLK	TestCode: 8260B_W_CL	Units: µg/L	Prep Date: 8/23/2003	RunNo: 41872						
Client ID:	Batch ID: 37356	TestNo: SW8260B		Analysis Date: 8/23/2003	SeqNo: 762282						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	BRL	5.0									
Carbon disulfide	BRL	5.0									
Ethylbenzene	BRL	5.0									
Methylene chloride	BRL	5.0									
Toluene	BRL	5.0									
Xylenes, Total	BRL	5.0									
Surr: 4-Bromofluorobenzene	43.72	0	50	0	87.4	71.8	143	0	0	0	
Surr: Dibromofluoromethane	47.82	0	50	0	95.6	80.3	123	0	0	0	
Surr: Toluene-d8	49.24	0	50	0	98.5	70.1	142	0	0	0	

Sample ID: MB-37356-1	SampType: MBLK	TestCode: 8260B_W_CL	Units: µg/L	Prep Date: 8/23/2003	RunNo: 41894						
Client ID:	Batch ID: 37356	TestNo: SW8260B		Analysis Date: 8/25/2003	SeqNo: 762725						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	BRL	5.0									
Carbon disulfide	BRL	5.0									
Ethylbenzene	BRL	5.0									
Methylene chloride	BRL	5.0									
Toluene	BRL	5.0									
Xylenes, Total	BRL	5.0									
Surr: 4-Bromofluorobenzene	42.94	0	50	0	85.9	71.8	143	0	0	0	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits  
 BRL Below Reporting Limit  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits  
 E Value above quantitation range  
 N Analyte not NELAC certified

**CLIENT:** Williams Environmental Services, Inc  
**Work Order:** 0308663  
**Project:** Macon II MGP

# ANALYTICAL QC SUMMARY REPORT

**BatchID:** 37356

Sample ID: MB-37356-1	SampType: MBLK	TestCode: 8260B_W_CL	Units: µg/L	Prep Date: 8/23/2003	RunNo: 41894						
Client ID:	Batch ID: 37356	TestNo: SW8260B		Analysis Date: 8/25/2003	SeqNo: 762725						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	48.34	0	50	0	96.7	80.3	123	0	0	0	
Surr: Toluene-d8	49.09	0	50	0	98.2	70.1	142	0	0	0	

Sample ID: LCS-37356	SampType: LCS	TestCode: 8260B_W_CL	Units: µg/L	Prep Date: 8/23/2003	RunNo: 41872						
Client ID:	Batch ID: 37356	TestNo: SW8260B		Analysis Date: 8/23/2003	SeqNo: 762283						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	95.37	5.0	100	0	95.4	71.1	120	0	0	0	
Toluene	98.13	5.0	100	0	98.1	84	124	0	0	0	
Surr: 4-Bromofluorobenzene	46.54	0	50	0	93.1	71.8	143	0	0	0	
Surr: Dibromofluoromethane	49.3	0	50	0	98.6	80.3	123	0	0	0	
Surr: Toluene-d8	48.37	0	50	0	96.7	70.1	142	0	0	0	

Sample ID: LCS-37356-1	SampType: LCS	TestCode: 8260B_W_CL	Units: µg/L	Prep Date: 8/23/2003	RunNo: 41894						
Client ID:	Batch ID: 37356	TestNo: SW8260B		Analysis Date: 8/25/2003	SeqNo: 762726						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	46.71	5.0	50	0	93.4	71.1	120	0	0	0	
Toluene	42.67	5.0	50	0	85.3	84	124	0	0	0	
Surr: 4-Bromofluorobenzene	42.27	0	50	0	84.5	71.8	143	0	0	0	
Surr: Dibromofluoromethane	45.31	0	50	0	90.6	80.3	123	0	0	0	
Surr: Toluene-d8	42.87	0	50	0	85.7	70.1	142	0	0	0	

**Qualifiers:** B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits  
 BRL Below Reporting Limit  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits  
 E Value above quantitation range  
 N Analyte not NELAC certified



AES

August 29, 2003

ANALYTICAL ENVIRONMENTAL SERVICES, INC.

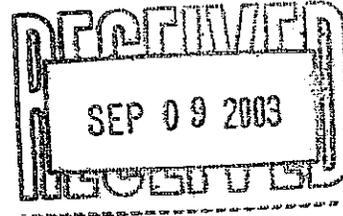
Matt Ebbert  
Williams Environmental Services, Inc  
500 Chase Park South  
Suite 150  
Birmingham, AL 35244

TEL: (205) 988-8305

FAX (205) 988-5249

RE: Macon II MGP

Dear Matt Ebbert:



Order No.: 0308828

Analytical Environmental Servs, Inc. received 1 sample on 8/21/2003 9:50:00 AM for the analyses presented in the following report.

No problems were encountered during the analyses. Additionally, all results for the associated Quality Control samples were within EPA and/or AES established limits. Any discrepancies associated with the analyses contained herein will be noted and submitted in the form of a project Case Narrative. AES' certifications are as follows:

-NELAC/Florida Certification number E87582 for analysis of Environmental Water, soil/hazardous waste, and Drinking Water, effective 07/02/03-06/30/04.

-AIHA Certification number 505 for analysis of Air, Paint Chips, Soil and Dust Wipes, effective until 10/01/03.

These results relate only to the items tested. This report may only be reproduced in full and contains 7 total pages (including cover letter).

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Allison Cantrell  
Project Manager

0308  
 Work Order: 0308662  
 Date: 8/20/03 Page 1 of 2

CHAIN OF CUSTODY

ANALYTICAL ENVIRONMENTAL SERVICES, INC.  
 3785 Presidential Pkwy., Atlanta, GA 30340-3704  
 TEL: (770) 457-8177 / TOLL FREE: (800) 972-4889 / FAX: (770) 457-8188

SP# 082003A

COMPANY: Williams Env. Services		ADDRESS: 500 CHASE PARK, S6 STE 150 B'ham, AL 35244		FAX: 5249		SIGNATURE: <i>Mike W. Dillon</i>		TOTAL PB	
PHONE: 205-988-8305	SAMPLE ID	DATE	TIME	Grb	Composite	Matrix (See codes)	ANALYSIS REQUESTED		
SAMPLED BY: Mike Dillon	#						PRESERVATION		
	SB-44-0-2	8/20/03	0730	X		50			
	SB-44-5-7		0740	X					
	SB-44-10-12		0750	X					
	SB-44-15-17		0800	X					
	SB-44-20-21		0816	X					
	SB-45-0-2		0836	X					
	SB-45-5-7		0840	X					
	SB-45-10-12		0850	X					
	SB-45-15-17		0900	X					
	SB-46-0-2		0910	X					
	SB-46-5-7		0950	X					
	SB-46-10-12		1000	X					
	SB-46-15-17		1010	X					
			1020	X					
RELINQUISHED BY: <i>Mike W. Dillon</i>	DATE TIME RECEIVED BY: 1: <i>MA</i> 8/21/03 9:50	PROJECT INFORMATION							
		PROJECT NAME: MALON II MGP							
		PROJECT #: 1100 2990							
		FAC ID#:							
		SITE ADDRESS: SPING ST LN, MALON GA							
		PROJECT MANAGER: MIKE DILLON							
		INVOICE TO: (IF DIFFERENT FROM ABOVE)							
SPECIAL INSTRUCTIONS COMMENTS:		SHIPMENT METHOD							
OUT		VIA:							
IN		VIA:							
		CLIENT (FedEx) UPS MAIL COURIER							
		GREYHOUND OTHER							
PHONE:	PROGRAM (see codes):								
QUOTE CONTRACT #:	DATA PACKAGE: I II III IV								

MATRIX CODES: A - Air GW - Groundwater SE - Sediment SO - Soil SW - Surface Water W - Water (Blanks) O - Other (specify)  
 PRESERVATIVE CODES: H - Hydrochloric acid - ice I - Ice only N - Nitric acid - ice S - Sulfuric acid - ice O - Other (specify) NA - None  
 PROGRAM: FLUST FLDC ALUST ENUST MSUST NCUST SCUST GAUST GACONV FLCONV

0300008

CHAIN OF CUSTODY

ANALYTICAL ENVIRONMENTAL SERVICES, INC.  
3785 Presidential Pkwy., Atlanta, GA 30340-3704  
TEL: (770) 457-8177 / TOLL FREE: (800) 972-4889 / FAX: (770) 457-8188

Work Order: 0300003A  
Date: 8/20/03 Page 2 of 2

COMPANY: WEST

PHONE: 205-988-8305

SAMPLED BY: Mike Dillon

ADDRESS: 500 CHASE PARK, 50 STE 150, BIRMINGHAM, AL 35244

FAX: 5247

SIGNATURE: Mike W. Dillon

SAMPLE ID	SAMPLED		DATE	TIME	Grab	Composite	Matrix (See codes)	ANALYSIS REQUESTED		REMARKS	No. of Containers
	DATE	TIME						PRESERVATION			
0300003A Drum-1	8/20/03	12:30			X	X	SO			* HOLD * F * F *	

RELINQUISHED BY: Mike W. Dillon 8/20/03 1500

DATE/TIME RECEIVED BY: Mike W. Dillon 8/20/03 9:50

PROJECT NAME: MAISON II MGP

PROJECT #: 1100 2790

FAC ID#: \_\_\_\_\_

SITE ADDRESS: MAISON, GA

PROJECT MANAGER: Mike Dillon

INVOICE TO: (IF DIFFERENT FROM ABOVE)

SHIPMENT METHOD: VIA \_\_\_\_\_

CLIENT: Fedex

UPS MAIL COURIER

GREYHOUND OTHER

SPECIAL INSTRUCTIONS COMMENTS:

QUOTE CONTRACT #:

MATRIX CODES: A - Air, GW - Groundwater, SF - Sediment, SO - Soil, SW - Surface Water, W - Water (Blanks), O - Other (specify)

PRESERVATIVE CODES: H - Hydrochloric acid, ice, I - Ice only, N - Nitric acid, ice, S - Sulfuric acid, ice, O - Other (specify), NA = None

PROGRAM: FLUST, FLDC, ALUSI, FNJUST, MSJUST, NCJUST, SCJUST, GAUST, GACONV, FILCONV

PROGRAM (see codes):

DATA PACKAGE: I II III IV

REF: Total # of Containers: 16

Time Request:  Jumbo/round,  Standard 3-5 Business Days,  Same Day Rush (with req.),  Next Business Day Rush,  2 Business Day Rush,  Other

Analytical Environmental Services, Inc.

Sample/Cooler Receipt Checklist

Client Williams Law Services

Work Order Number 0308662/0308828

Checklist completed by Nyrene Osore 8/21/03  
Signature Date

Carrier name: FedEx  UPS  Courier  Client  US Mail  Other

Shipping container/cooler in good condition? Yes  No  Not Present

Custody seals intact on shipping container/cooler? Yes  No  Not Present

Custody seals intact on sample bottles? Yes  No  Not Present

Container/Temp Blank temperature in compliance? Yes  No

Cooler #1 5.0 Cooler #2 \_\_\_\_\_ Cooler #3 \_\_\_\_\_ Cooler #4 \_\_\_\_\_ Cooler #5 \_\_\_\_\_ Cooler #6 \_\_\_\_\_

Chain of custody present? Yes  No

Chain of custody signed when relinquished and received? Yes  No

Chain of custody agrees with sample labels? Yes  No

Samples in proper container/bottle? Yes  No

Sample containers intact? Yes  No

Sufficient sample volume for indicated test? Yes  No

All samples received within holding time? Yes  No

Was TAT marked on the COC? Yes  No

Proceed with Standard TAT as per project history? Yes  No  Not Applicable

Water - VOA vials have zero headspace? No VOA vials submitted  Yes  No

Water - pH acceptable upon receipt? Yes  No  Not Applicable

Adjusted? \_\_\_\_\_ Checked by \_\_\_\_\_

See Case Narrative for resolution of the Non-Conformance.

**Analytical Environmental Servs, Inc.**

Date: 29-Aug-03

CLIENT: Williams Environmental Services, Inc  
Lab Order: 0308828  
Project: Macon II MGP  
Lab ID: 0308828-001

Client Sample ID: SB-45-15-17  
Collection Date: 8/20/2003 9:00:00 AM  
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ICP METALS, SPLP		SW1312/6010B				Analyst: CDW
Lead	0.0808	0.0500		mg/L	1	8/27/2003 2:21:00 PM

Qualifiers: \* Value exceeds Maximum Contaminant Level  
BRL Below Reporting Limit  
H Holding times for preparation or analysis exceeded  
N Analyte not NELAC certified  
Rpt Limit Reporting Limit  
B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P NELAC analyte certification pending  
S Spike Recovery outside accepted recovery limits

CLIENT: Williams Environmental Services, Inc  
 Work Order: 0308828  
 Project: Macon II MGP

**ANALYTICAL QC SUMMARY REPORT**

BatchID: 37474

Sample ID	MB-37474	SampType: MBLK	TestCode: 1312_M	Units: mg/L	Prep Date: 8/28/2003	RunNo: 42025					
Client ID:		Batch ID: 37474	TestNo: SW1312/6010		Analysis Date: 8/27/2003	SeqNo: 766072					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	BRL	0.0500									

Sample ID	LCS-37474	SampType: LCS	TestCode: 1312_M	Units: mg/L	Prep Date: 8/28/2003	RunNo: 42025					
Client ID:		Batch ID: 37474	TestNo: SW1312/6010		Analysis Date: 8/27/2003	SeqNo: 766071					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	5.093	0.0500	5	0	102	85	115	0	0		*

Sample ID	0308828-001AMS	SampType: MS	TestCode: 1312_M	Units: mg/L	Prep Date: 8/28/2003	RunNo: 42025					
Client ID:	SB-45-15-17	Batch ID: 37474	TestNo: SW1312/6010		Analysis Date: 8/27/2003	SeqNo: 766075					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	5.211	0.0500	5	0.0808	103	75	125	0	0		*

Sample ID	0308828-001ADUP	SampType: DUP	TestCode: 1312_M	Units: mg/L	Prep Date: 8/28/2003	RunNo: 42025					
Client ID:	SB-45-15-17	Batch ID: 37474	TestNo: SW1312/6010		Analysis Date: 8/27/2003	SeqNo: 766074					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.06985	0.0500	0	0	0	0	0	0.0808	14.5		20

Qualifiers: B Analyte detected in the associated Method Blank  
 H Holding times for preparation or analysis exceeded  
 R RPD outside accepted recovery limits  
 BRL Below Reporting Limit  
 J Analyte detected below quantitation limits  
 S Spike Recovery outside accepted recovery limits  
 E Value above quantitation range  
 N Analyte not NELAC certified

**Analytical Environmental Servs, Inc.**

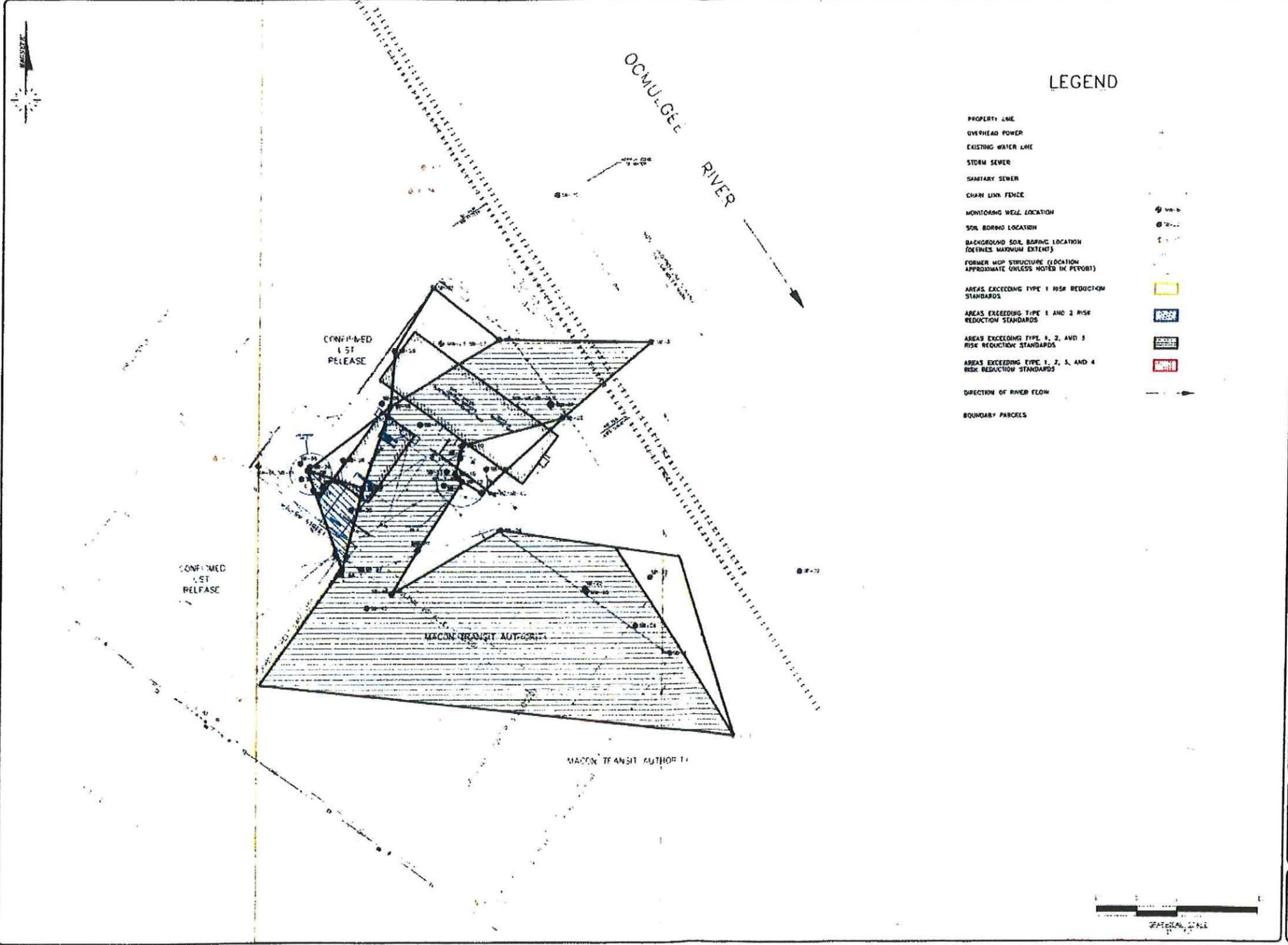
Date: 29-Aug-03

**CLIENT:** Williams Environmental Services, Inc  
**Project:** Macon II MGP  
**Lab Order:** 0308828

**CASE NARRATIVE**

Matt Ebbert requested SPLP Pb analysis on sample "SB-45-15-17" as next day rush turnaround 8/27/03 2:00pm.





**LEGEND**

- PROPERTY LINE
- OVERHEAD POWER
- EXISTING WATER LINE
- STORM SEWER
- SANITARY SEWER
- CHAIN LINK FENCE
- MONITORING WELL LOCATION
- SOIL BORING LOCATION
- BACKGROUND SOIL BARRING LOCATION (DEFINES MAXIMUM EXTENT)
- FORMER MGP STRUCTURE (LOCATION APPROXIMATE UNLESS NOTED IN REPORT)
- AREAS EXCEEDING TYPE 1 RISK REDUCTION STANDARDS
- AREAS EXCEEDING TYPE 1 AND 2 RISK REDUCTION STANDARDS
- AREAS EXCEEDING TYPE 1, 2, AND 3 RISK REDUCTION STANDARDS
- AREAS EXCEEDING TYPE 1, 2, 3, AND 4 RISK REDUCTION STANDARDS
- DIRECTION OF RIVER FLOW
- BOUNDARY PARCELS

Prepared By:  
**Williams Environmental Services, Inc.**  
 A Subsidiary of Williams Group International, Inc.  
 2000 North 15th Street, Suite 150, Birmingham, Alabama 35204  
 205-988-5555 Fax: 205-988-5559



AREAS EXCEEDING RISK REDUCTION STANDARDS IN SOIL

FORMER MACON 2 MGP FACILITY  
 MACON, GEORGIA



