

ACTION MEMORANDUM

To: Daphne Neel, Chief
Bureau of Land and Waste Management

From: Lucas Berresford, Project Manager *LB*
State Remediation Section, Bureau of Land and Waste Management

Thru: R. Gary Stewart P.E., Section Manager *R. Gary Stewart*
State Remediation Section, Bureau of Land and Waste Management

Date: September 16, 2009

Subject: Request for Removal Action Huger Street Former Manufactured Gas Plant
(MGP) Site
Columbia, South Carolina
BLWM File 52561
PCAS # 5295

I. Purpose

The purpose of this action memorandum is to request and document approval of the proposed removal action at the Huger Street Former Manufactured Gas Plant (MGP) Site in Columbia, South Carolina. This site poses a threat to human health and the environment that meets the National Contingency Plan (NCP) Section 300.415(b)(2) criteria for removal actions.

II. Site Description / Site History

A. Physical Location and Site History

The site is located at 1409 Huger Street in Columbia, South Carolina. The site is situated in the western portion of the City of Columbia, near the Congaree River as shown on **Figure 1-1**. The South Carolina Electric & Gas Company (SCE&G) owned two parcels of land totaling approximately 7 acres, which are referred to as Parcel "A" and Parcel "B" as shown in **Figure 1-2**. Structures relating to both the former MGP operations and bus maintenance facility were generally situated on a city block (Parcel "A") which is approximately 5.88 acres in size and bounded by Huger Street to the east, Washington Street to the south, Williams Street to the west, and Hampton Street to the north. A 72-inch diameter concrete storm water drainage culvert passes through the site and discharges to the Congaree River at the outfall area located directly south of Gervais Street. This area is referred to as the Culvert Outfall Area. Parcel "B" is 1.11 acres in size and is located to the south of Parcel "A" and is bounded by Huger Street to the east, Williams Street to the north, Kline Steel Property to the south, and SCE&G property to the west. Parcel "B" has been the subject of additional investigations due to

redevelopment interests and is being reported to and addressed by the Department separately.

Manufactured gas plant operations were started at the Site as early as 1906 and were discontinued in 1954. Over the approximate 48-year operational period, gas was produced initially by the coal gasification process and later primarily by the carbureted water gas process. During operation, the site housed three gasholders with capacities of 60,000 cubic feet, 300,000 cubic feet, and 500,000 cubic feet; a gas works building, rail lines, and a coal trestle. The coal trestle extended to the southern property edge near Washington Street and several oil tanks were near the gas works building. Other MGP structures included a retort house, high-pressure gas tank, and two coke trestle extensions (between retort building and gas works building, and west from retort house to Williams Street). The highest gas production for the Site occurred between 1940 and 1950. Gas operations decreased from 1950 to 1954 as gas production was replaced with natural gas service via interstate pipelines. By 1954, continuous natural gas distribution commenced and the site was converted into a stand-by facility. Between 1959 and 1966, one gasholder, several buildings (retort house and buildings associated with gas works complex), gas tanks, tar tanks, and oil tanks had been removed. By 1970, only one gasholder and several smaller buildings remained on-Site and a maintenance garage was built for use by the Columbia Area Regional Transit Authority (CARTA) for bus operations and maintenance. The CARTA operations were moved to a different location in May 2008. After CARTA vacated the site, the above-grade bus maintenance facility structures were demolished in preparation for the completion of the supplemental delineation activities and subsequent removal operations.

B. Remedial Investigation (RI)

SCE&G initially began remedial investigation activities in the 1990s. On August 19, 2002, they signed a Voluntary Cleanup Contract with the Department, which listed specific requirements that SCE&G must perform to complete the remedial investigation and removal at the Site. The Department agreed to consider and review all prior data collected before the execution of the contract.

During the RI, on-Site and off-Site soil, on-Site and off-Site groundwater, surface water, sediment and soil gas samples were collected to characterize the nature and extent of environmental releases from the Site. Geologic and hydrogeologic information was collected using a GeoProbe® along with the sampling of all permanent monitoring wells installed during the RI. Data from all locations were used to support fate and transport analyses and human health and ecological risk assessments.

RI activities began at the site in October 1995 with the implementation of passive and active soil gas surveys. Their purpose was to identify BTEX (benzene, toluene, ethylbenzene, and xylenes) hot spots on site. The soil gas data report indicated that both methods were effective in identifying BTEX, with the active method more sensitive to benzene and the passive method more sensitive to ethylbenzene and xylene. Additional field activities were conducted in October 1996 thru January 2006. The results of these

sample collection activities indicate that volatile and semi-volatile petroleum hydrocarbon compounds are present in Site media. The most frequently observed contaminant groups by media are listed below.

- VOC's and SVOC's are present in on-Site subsurface soils
- VOC's and SVOC's are present in on-Site groundwater

Benzene and naphthalene are the primary constituents of concern for groundwater and they are generally limited to the site location of Parcel "A". They are associated with the coal tar and petroleum residuals that were present during the time of operation. The highest concentrations and widest spatial distribution of soil impacts were generally found in the 2 to 15 feet bgs interval. Soil impacts are generally limited to on-site, and are most prevalent in the central site area under the former maintenance building and in the former tar well and tar tanks area. More recent impacts from the USTs have commingled with the previous soil MGP impacts on-site. Soil impacts appear to be related to former and/or potential existing sources and to residuals from historical operations.

The following compounds were identified as contaminants of concern for the site:

- Benzene – groundwater; (surface, subsurface, and unsaturated soils)
- Naphthalene – groundwater; (surface, subsurface, and unsaturated soils)
- Benzo(a)pyrene - (surface, subsurface and unsaturated soils)
- DNAPL – saturated soils

C. Other Actions

Since submittal of the RI Report in May 2007, video reconnaissance of the culvert pipe from the site to the Culvert Outfall area and numerous inspections of the Culvert Outfall area sediments have been completed. Only minimal occurrences of light sheens in the Culvert Outfall area have been reported in a few of the events and no evidence of site related impacts infiltrating into the pipe were identified.

Supplemental Delineation Activities were conducted to provide additional information for areas identified in **Figure 1**, during March 9-12, 2009. The purpose of these additional activities was to further delineate potential impacts in areas previously inaccessible due to the presence of the former structures, define the planned extent of removal operations, to gather information on the potential need for excavation water management during removal operations, and to collect representative samples for disposal facility characterization. Fifteen (15) test pits were excavated and evaluated for these parameters.

Completion of the supplemental delineation activities provided the following general observations:

- With the exception of the gas holder #1 area (SDTP-2 and SDTP-3), a significant zone of visually unimpacted overburden material is present over much of the planned excavation area. This material must be removed and managed to access the underlying impacted material;
- Significant underground structures and oversized debris are present at the site that will require management during removal activities;
- Groundwater infiltration into the excavation areas within the saturated zone will occur and will require management and proper disposal;
- Material conditioning to render saturated material suitable for transport and disposal will most likely be required;
- The bulk of the impacted source material is located within the saturated zone under the former bus maintenance facility structure (SDTP-6 and SDTP-7);
- Impacts were minimal in the northeastern corner of the site, when compared to the central portion (former tar well and oil tanks area);
- No impacts were observed in the southeastern site, south of the buried large diameter storm drain culvert (SDTP-10, SDTP-11 and SDTP-13); and
- Only minimal, non-MGP source material with potential olfactory impacts and slight staining was observed in the test pits excavated in the southwestern portion of the site (SDTP-12, SDTP-14 and SDTP-15).

D. Removal Evaluation

Contamination at the Site is associated with by-products (i.e. coal tar) generated by the production of coal gas. Historic releases from underground storage tanks, inadvertent spills, etc. associated with the bus maintenance facility may have also impacted the Site. The purpose of this Interim Removal Action is to remove the contaminated soil. The locations of all areas of removal are shown in **Figures 3-1 and 3-2**.

III. Threats to Public Health or Welfare or the Environment, and Statutory and Regulatory Authorities.

The Department has determined that a release of hazardous substances has occurred at the Site and may present a danger to public health and welfare or the environment. In order to protect public health and the environment, it is necessary that action be taken to

abate the release of hazardous substances from the site. The following NCP Section 300.415(b)(2) criteria are being met for this removal action.

A. Threat to Public Health or Welfare

1. **Section 300.415(b)(2)(i)** - *Actual or potential exposure to nearby human populations, animals or the food chain from hazardous substances or pollutants or contaminants*

Trespassers and workers could potentially be exposed to the contamination on site by direct contact, inhalation, and/or ingestion.

B. Threat to Environment

1. **Section 300.415(b)(2)(v)** - *Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.*

Since there is significant contamination present in the surficial and subsurface soils, inclement weather may transport hazardous substances off the site and infiltration of rainwater may cause the hazardous substances to percolate through the soil potentially impacting groundwater.

IV. Proposed Actions

A. Proposed Action Description

The monitoring of groundwater quality to assess the effectiveness of remediation and the subsequent natural attenuation of dissolved phase constituents will follow on-site source removal via excavation at the site.

For removal planning purposes, the surface soil has been divided into three types based on its final disposition:

- SS-L – Surface soil designated for landfill disposal;
- SS-CAR – Surface soil composed of concrete and asphalt that will be transported to a concrete/asphalt recycling facility; and
- SS-RFM – Surface soil suitable for re-use as fill material (i.e., visually not impacted).

Concrete, asphalt and the underlying surficial soil, from the current ground surface to approximately 2 feet bgs, will be removed and replaced with clean, imported backfill. As

shown on **Figure 3-1**, a layer of either asphalt or concrete covers a significant portion of the planned surface soil removal area. The surface soil, concrete and asphalt will be segregated for proper disposal. This approach will eliminate potential surface soil exposure routes and provide a maximum level of protection for future site uses.

Both unsaturated and saturated subsurface excavation operations will be conducted in order to remove known or suspected targeted source material (TSM). For removal planning purposes, TSM is defined as material that contains obvious signs of site-related impacts such as coal tar or petroleum-based products. Similar to the surface soil excavation, an attempt will be made to segregate zones of reusable fill material (RFM) for potential re-use as backfill below 2 feet bgs. RFM and imported fill will be used to backfill the excavated areas. Backfill material within the saturated zone (Area 7), on **Figure 4-3**, will be amended with a commercially available oxidant (e.g., PermeOx® Plus) to enhance natural attenuation of dissolved phase constituents following the removal action.

The following are approximate depths and limits of excavations in all areas of concern illustrated in **Figure 4-3** across the site:

- **Area 1** is the northernmost planned subsurface excavation area and was the approximate location of the former purifier boxes. The planned operations in Area 1 will consist of removing the top 2 feet of asphalt and underlying surface material for re-use as deep backfill or transportation to the recycling facility/landfill. The next interval, 2 to 6 feet bgs, will be set aside for re-use as deep backfill (RFM). The TSM in the 6 to approximately 13 feet bgs interval will be removed and transported off-site for disposal.
- **Area 2** is located directly south of Area 1 and is the location of the former survey and map department structure. The Area 2 excavation will consist of removal of the top 2 feet of material for either off-site recycling/disposal or re-use, segregation of the RFM in the 2-7 foot interval and removal of the TSM from 7 to 12 feet bgs.
- **Area 3** contains the northern portion of the former gasholder #1 and the former gas operations building. The excavation plan for Area 3 consists of removing the 0 to 2 feet bgs interval and either transporting it off-site for disposal/recycling or segregating it for re-use as backfill material depending on its location. If no visual impacts are noted, the soil from 2 to 8 feet bgs will set aside as RFM. The TSM in the 8 to 10 feet bgs interval will be removed and transported off-site for disposal.
- **Area 4** contains the remainder of the gasholder #1 and the former gas operations building. Two separate intervals (0 to 5 feet bgs and 8 to 16 feet bgs) of potential TSM were identified in the test pits and soil borings completed in this area. For planning purposes it is currently assumed that the unimpacted zone between the two intervals will be set aside as RFM. However, actual field conditions may dictate removal of the entire column of soil in this area.

- **Area 5** is the location of the majority of the former gas works building. The interval of excavation from 2 to 16 feet bgs has been designated as TSM material for this area. Since the impacts in this area were sporadic in the 2-8 feet bgs interval, some of this interval may contain significant amounts of RFM. If a sufficient volume of RFM is encountered it will be segregated for re-use.
- **Area 6** excavation is being conducted to remove potentially impacted material. TSM was identified in the approximate 6 to 10 feet bgs interval at these locations. Black staining was also encountered at approximately 2 to 5 feet bgs. As a result, the TSM interval is currently planned to extend from 2 to 10 feet bgs in this area.
- **Area 7** is the largest, deepest and most heavily impacted planned excavation area. It is the location of the former tar wells and oil tanks. Soil borings and test pits completed in this area identified TSM beginning approximately 8 feet bgs and extending to the confining layer, which is located approximately 18 to 22 feet bgs. Saturated material begins approximately 15 to 18 feet bgs. The surface soil, concrete and asphalt will be managed similarly to the other areas of the site. The 2 to 8 feet bgs interval will be set aside as RFM and the remaining TSM material down to the confining layer will be removed and transported off-site for disposal.
- **Area 8** is being excavated in order to remove TSM identified at approximately 2 to 6 feet bgs.
- **Area 9** removal operations will include removal of the surface soil, asphalt and concrete; and removal and disposal of TSM down to approximately 16 feet bgs.

B. Applicable or Relevant and Appropriate Requirements (ARARs)

Federal ARARs proposed for the removal action are the Resource Conservation and Recovery Act (RCRA), Occupational Safety and Health Act (OSHA), the Hazardous Material Transportation Act (HMTA) and the Offsite Rule. State ARARs include the Pollution Control Act and the South Carolina Hazardous Waste Management Act. These ARARs will be followed during the removal action.

C. Engineering Evaluation / Cost Analysis

This action is being conducted as a time-critical removal action during the RI / FS process and therefore an Engineering Evaluation / Cost Analysis will not be conducted.

V. Expected Change in the Site Conditions Should Action be Delayed or Not Taken

If the recommended action is not performed or is delayed, the primary sources of contamination will remain in place and continue to leach to groundwater, and provide potential exposure to worker's on-site.

VI. Public Participation

Public participation activities have been consistent with the Department's Public Participation Guidelines. The Notice of Availability of the Administrative Record and a brief summary of the proposed response action are being published in the State Newspaper. An Administrative Record has been established containing all the documents used to make this decision. A copy of the Administrative Record has been placed at the Richland County Public Library, at 1431 Assembly Street.

VII. Outstanding Policy Issues

None.

VIII. Enforcement

On August 19, 2002, SCANA Corporation (SCANA) [on behalf of its primary subsidiary, South Carolina Electric & Gas (SCE&G)] and the South Carolina Department of Health and Environmental Control (SCDHEC) executed a Responsible Party Voluntary Cleanup Contract (VCC) #02-5295-RP for the Columbia Fleet Maintenance Site, also referred to as the former Huger Street Manufactured Gas Plant (MGP) facility. The VCC lists specific requirements that SCE&G must perform to complete the remedial investigation and remediation at the site.

IX. Response Decision Summary

The analytical results for the RI activities are presented in table form in the Final Draft Remedial Investigation Report dated June 14, 2007. Additional information can be found in the Summary of Supplemental Delineation Activities Report dated April 21, 2009.

This decision document represents the selected removal action for the Huger Street Former Manufactured Gas Plant Site that has been developed according to CERCLA, as amended by SARA, and not inconsistent with the NCP. This decision is based on available information contained in the Administrative Record for the Site.

Conditions of the site meet the NCP Section 300.415(b)(2) criteria for a removal and I recommend your approval of the proposed removal action.

APPROVE: Daphne B. Neel Date: 9/21/09

DISAPPROVE: _____ Date: _____

FIGURES

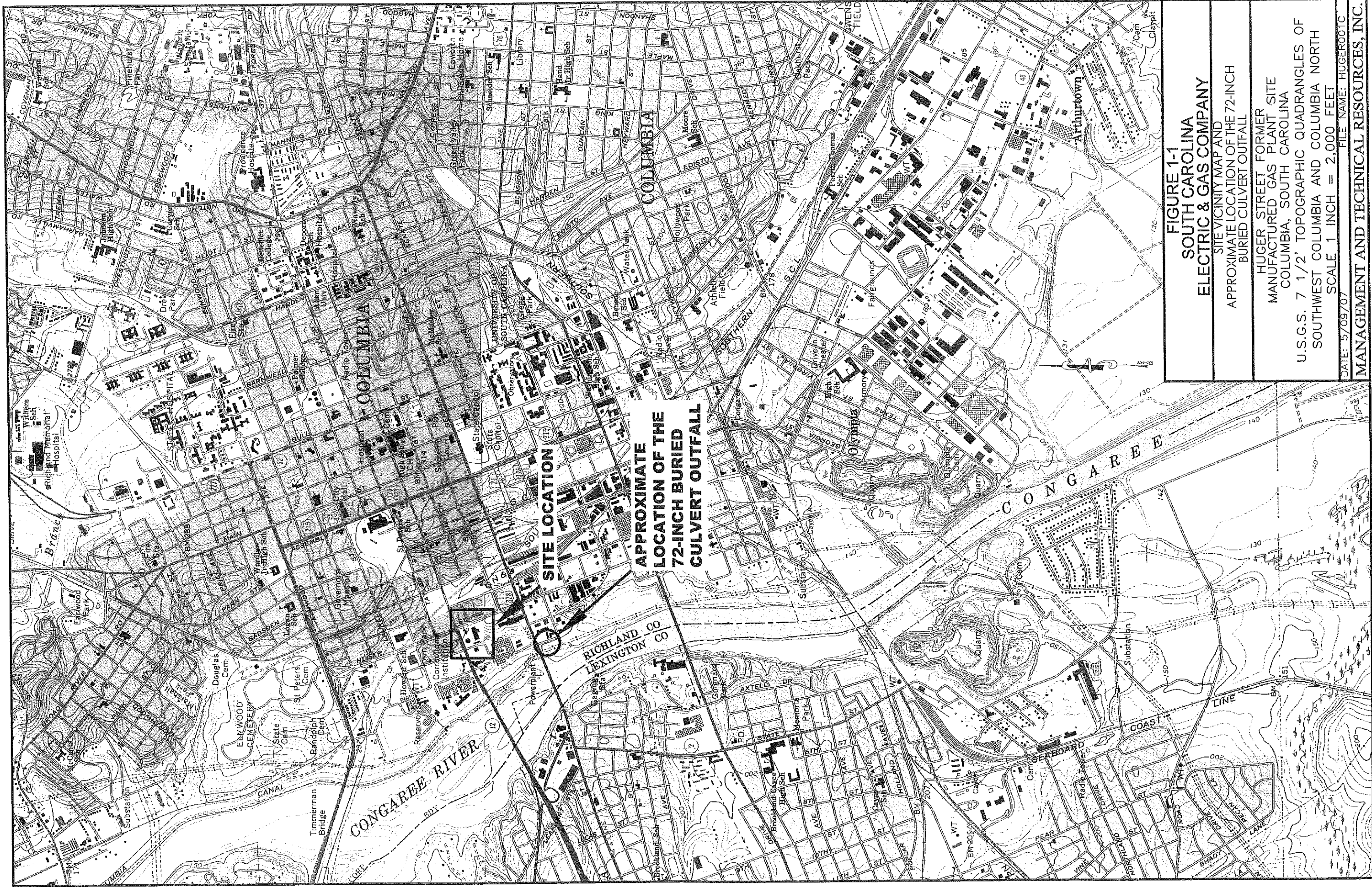
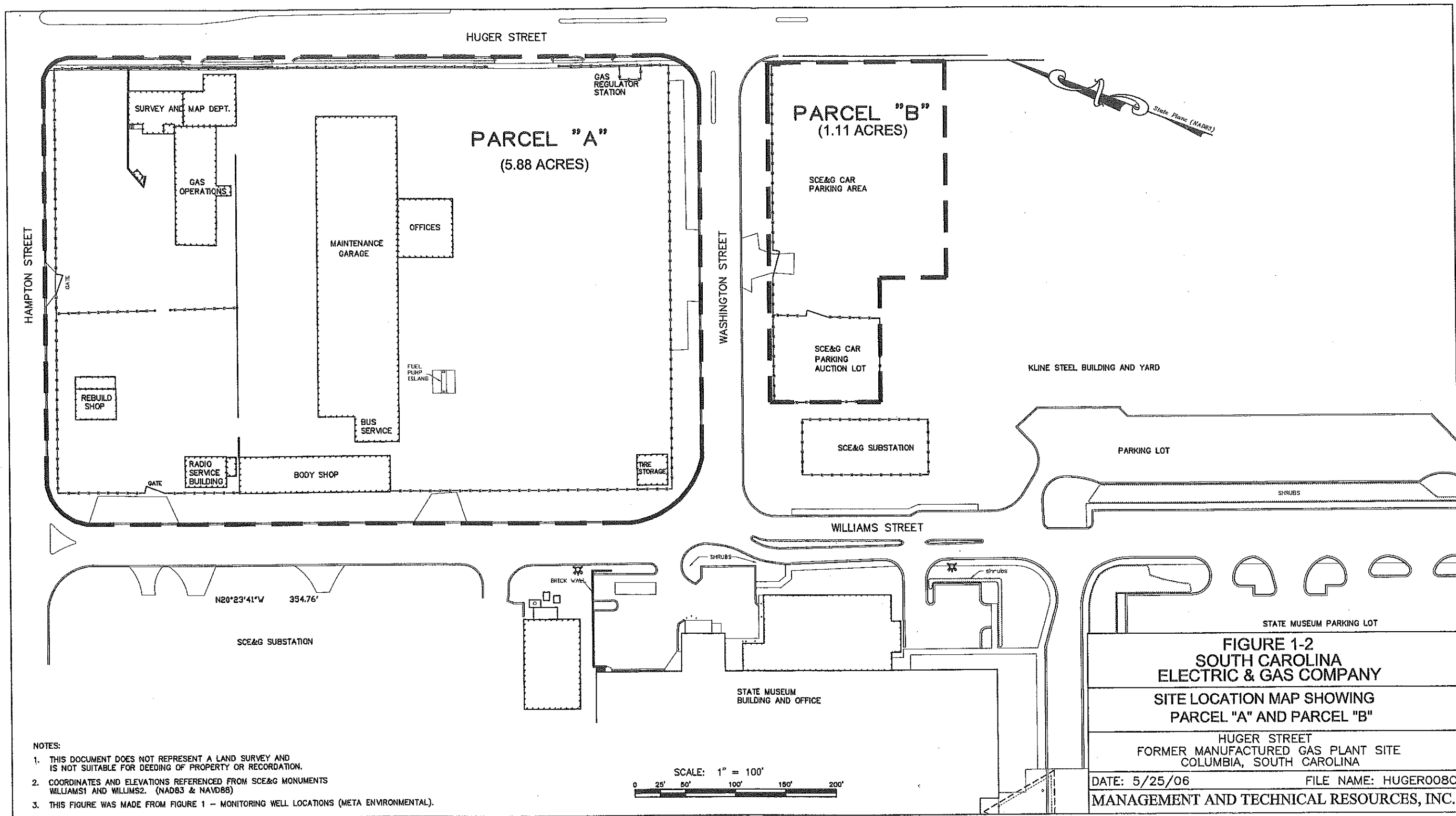


FIGURE 1-1
SOUTH CAROLINA
ELECTRIC & GAS COMPANY

SITE VICINITY MAP AND
 APPROXIMATE LOCATION OF THE 72-INCH
 BURIED CULVERT OUTFALL

HUGER STREET FORMER
 MANUFACTURED GAS PLANT SITE
 COLUMBIA, SOUTH CAROLINA
 U.S.G.S. 7 1/2' TOPOGRAPHIC QUADRANGLES OF
 SOUTHWEST COLUMBIA AND COLUMBIA NORTH
 SCALE 1 INCH = 2,000 FEET

DATE: 5/09/07 FILE NAME: HUGEROOTIC
 MANAGEMENT AND TECHNICAL RESOURCES, INC.



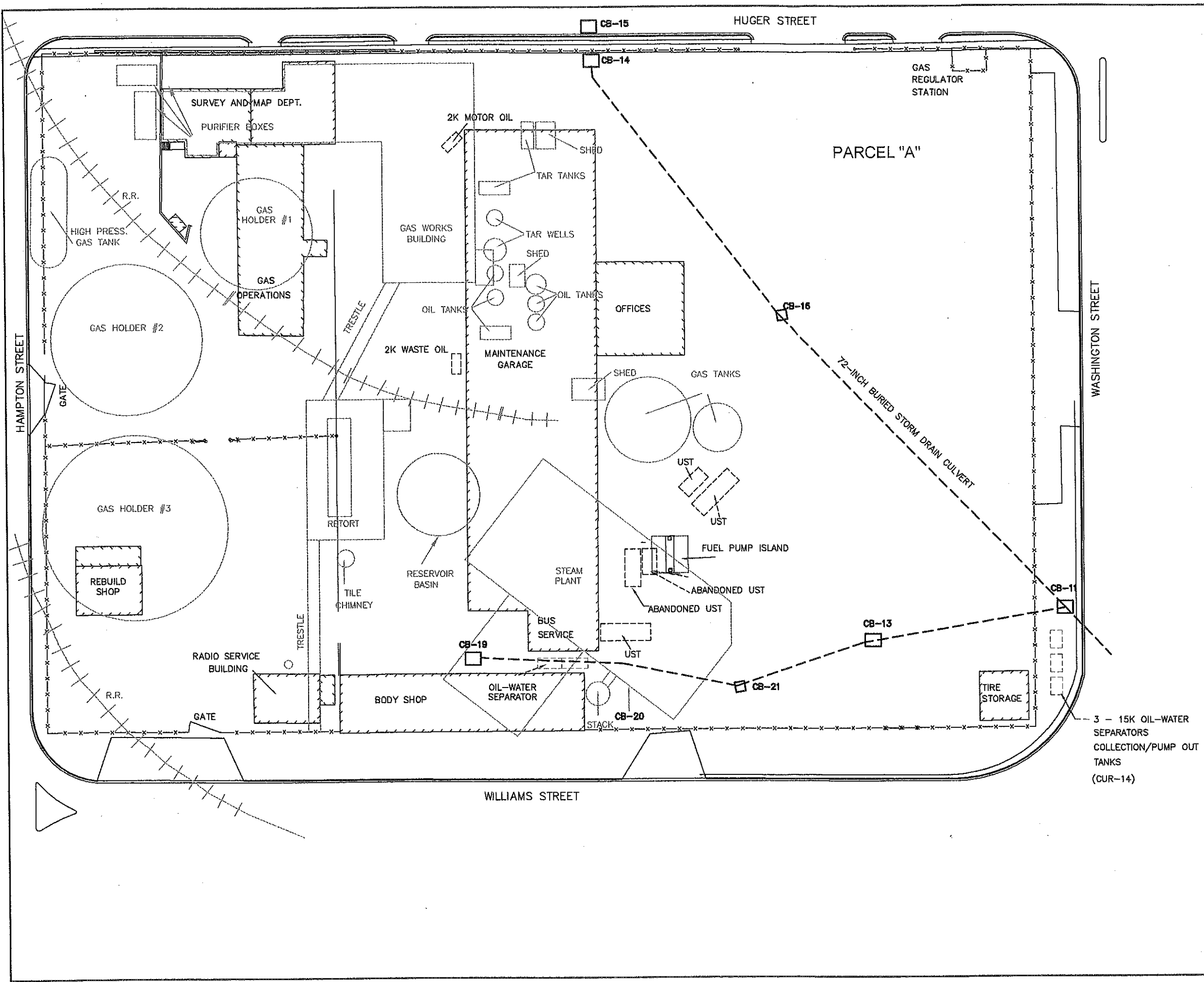
- NOTES:
1. THIS DOCUMENT DOES NOT REPRESENT A LAND SURVEY AND IS NOT SUITABLE FOR DEEDING OF PROPERTY OR RECORDATION.
 2. COORDINATES AND ELEVATIONS REFERENCED FROM SCE&G MONUMENTS WILLIAMS1 AND WILLIAMS2. (NAD83 & NAVD88)
 3. THIS FIGURE WAS MADE FROM FIGURE 1 - MONITORING WELL LOCATIONS (META ENVIRONMENTAL).

FIGURE 1-2
SOUTH CAROLINA
ELECTRIC & GAS COMPANY
SITE LOCATION MAP SHOWING
PARCEL "A" AND PARCEL "B"

HUGER STREET
 FORMER MANUFACTURED GAS PLANT SITE
 COLUMBIA, SOUTH CAROLINA

DATE: 5/25/06 FILE NAME: HUGER008C
 MANAGEMENT AND TECHNICAL RESOURCES, INC.

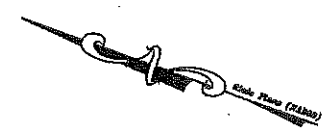
FIGURE 1
SOUTH CAROLINA ELECTRIC & GAS COMPANY
FORMER MGP AND BUS MAINTENANCE
FACILITY STRUCTURES
 HUGER STREET
 FORMER MANUFACTURED GAS PLANT SITE
 COLUMBIA, SOUTH CAROLINA
 DATE: 8/7/08 FILE NAME: TEST PIT FIG1
 MANAGEMENT AND TECHNICAL RESOURCES, INC

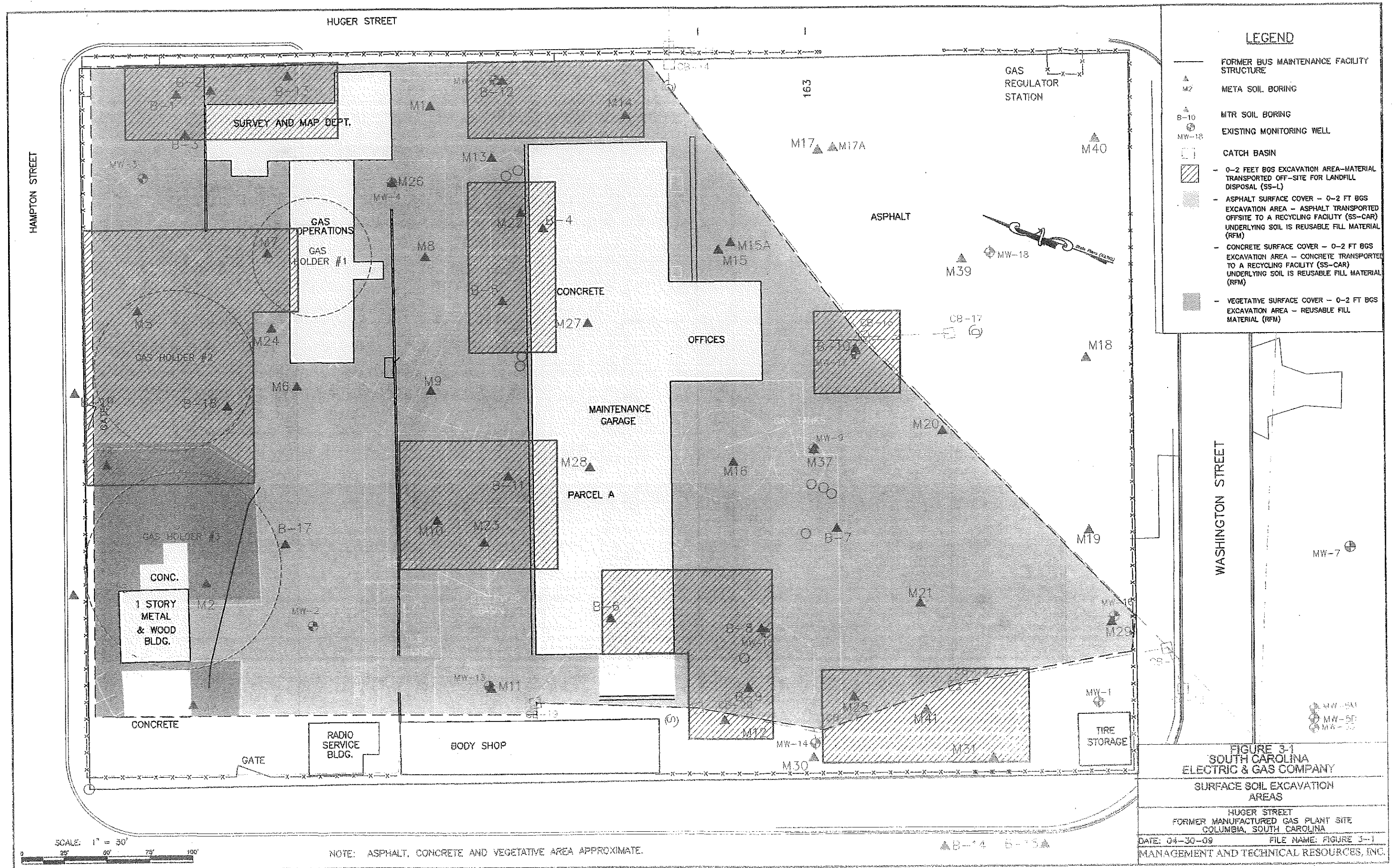


LEGEND

- FORMER MGP STRUCTURE, OUTLINE OR FEATURE
- BUS MAINTENANCE FACILITY STRUCTURE, OUTLINE OR FEATURE
- CATCH BASIN

SCALE: 1" = 60'
 0 15' 30' 60' 90' 120'





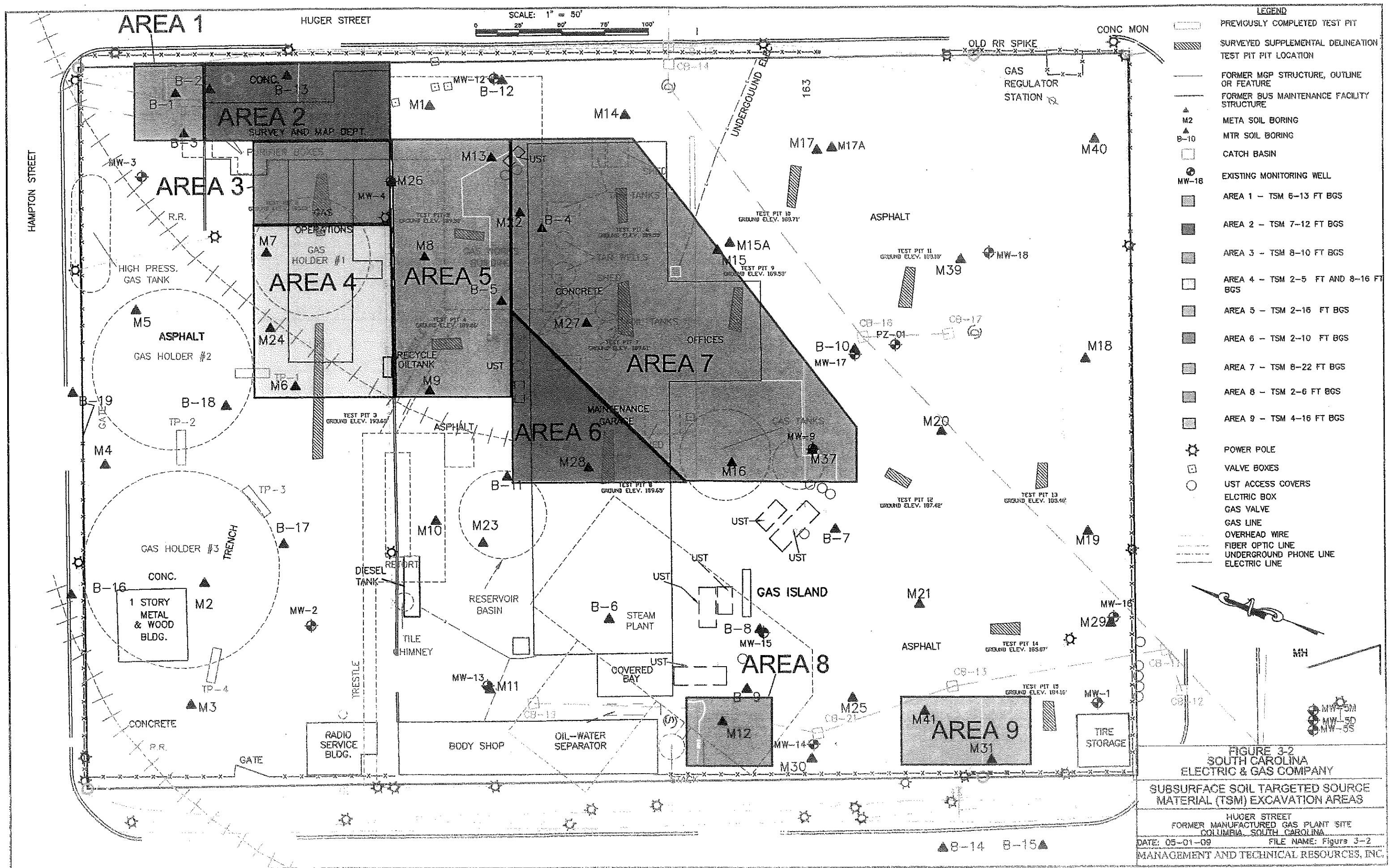
LEGEND

- FORMER BUS MAINTENANCE FACILITY STRUCTURE
- ▲ M2 META SOIL BORING
- ▲ B-10 MTR SOIL BORING
- ⊙ MW-18 EXISTING MONITORING WELL
- CATCH BASIN
- ▨ 0-2 FEET BGS EXCAVATION AREA—MATERIAL TRANSPORTED OFF-SITE FOR LANDFILL DISPOSAL (SS-L)
- ▩ ASPHALT SURFACE COVER — 0-2 FT BGS EXCAVATION AREA — ASPHALT TRANSPORTED OFFSITE TO A RECYCLING FACILITY (SS-CAR) UNDERLYING SOIL IS REUSABLE FILL MATERIAL (RFM)
- ▧ CONCRETE SURFACE COVER — 0-2 FT BGS EXCAVATION AREA — CONCRETE TRANSPORTED TO A RECYCLING FACILITY (SS-CAR) UNDERLYING SOIL IS REUSABLE FILL MATERIAL (RFM)
- VEGETATIVE SURFACE COVER — 0-2 FT BGS EXCAVATION AREA — REUSABLE FILL MATERIAL (RFM)

FIGURE 3-1
SOUTH CAROLINA
ELECTRIC & GAS COMPANY
SURFACE SOIL EXCAVATION
AREAS
 HUGER STREET
 FORMER MANUFACTURED GAS PLANT SITE
 COLUMBIA, SOUTH CAROLINA
 DATE: 04-30-09 FILE NAME: FIGURE 3-1
 MANAGEMENT AND TECHNICAL RESOURCES, INC.

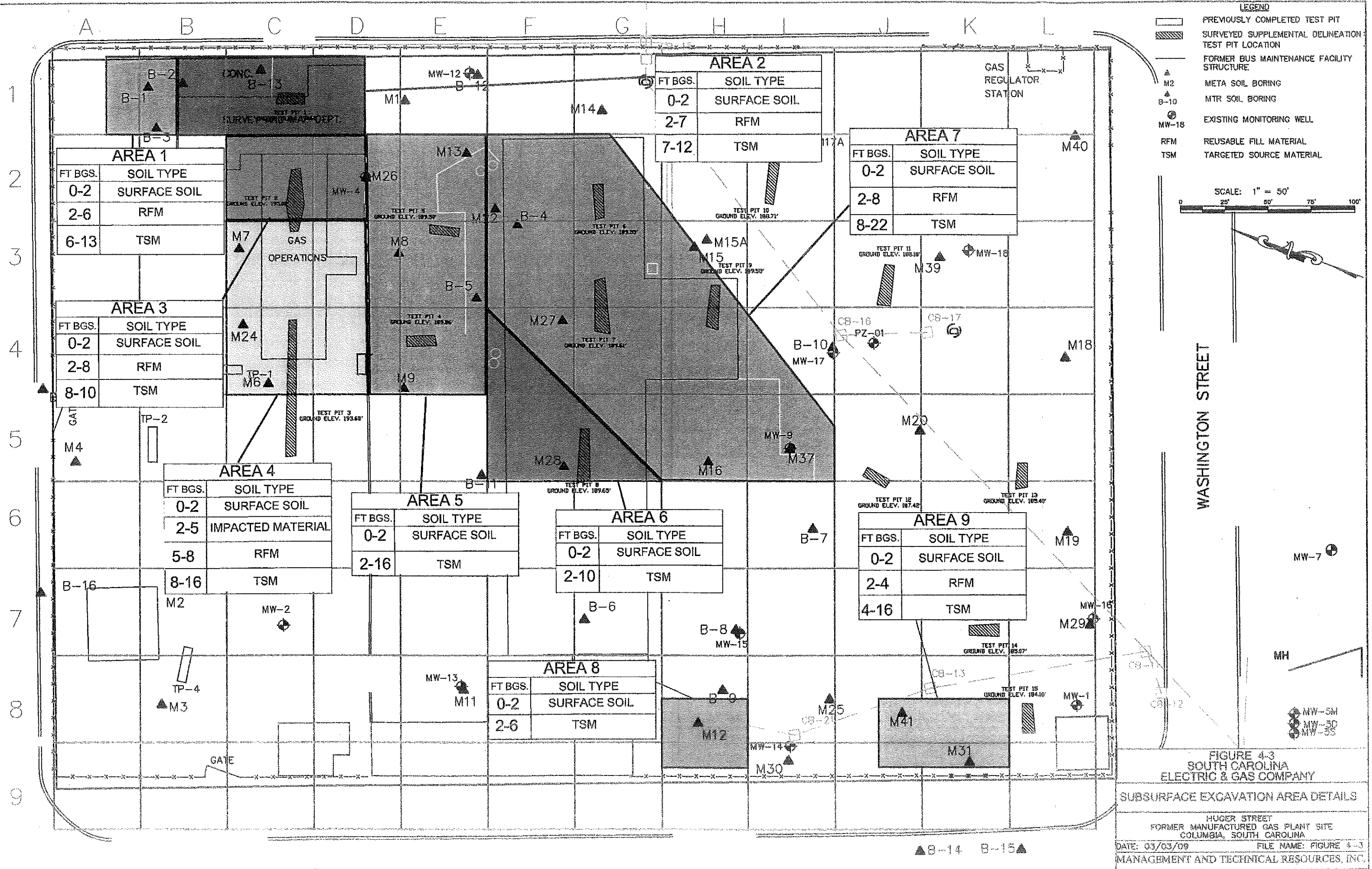
SCALE: 1" = 30'
 0 25' 50' 75' 100'

NOTE: ASPHALT, CONCRETE AND VEGETATIVE AREA APPROXIMATE.

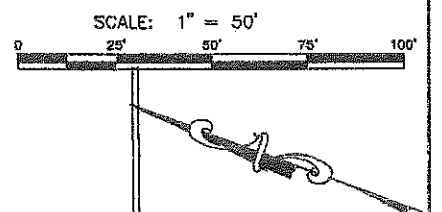


- LEGEND**
- PREVIOUSLY COMPLETED TEST PIT
 - SURVEYED SUPPLEMENTAL DELINEATION TEST PIT PIT LOCATION
 - FORMER MGP STRUCTURE, OUTLINE OR FEATURE
 - FORMER BUS MAINTENANCE FACILITY STRUCTURE
 - M2 META SOIL BORING
 - B-10 MTR SOIL BORING
 - CATCH BASIN
 - MW-16 EXISTING MONITORING WELL
 - AREA 1 - TSM 6-13 FT BGS
 - AREA 2 - TSM 7-12 FT BGS
 - AREA 3 - TSM 8-10 FT BGS
 - AREA 4 - TSM 2-5 FT AND 8-16 FT BGS
 - AREA 5 - TSM 2-16 FT BGS
 - AREA 6 - TSM 2-10 FT BGS
 - AREA 7 - TSM 8-22 FT BGS
 - AREA 8 - TSM 2-6 FT BGS
 - AREA 9 - TSM 4-16 FT BGS
 - POWER POLE
 - VALVE BOXES
 - UST ACCESS COVERS
 - ELECTRIC BOX
 - GAS VALVE
 - GAS LINE
 - OVERHEAD WIRE
 - FIBER OPTIC LINE
 - UNDERGROUND PHONE LINE
 - ELECTRIC LINE

FIGURE 3-2
SOUTH CAROLINA
ELECTRIC & GAS COMPANY
SUBSURFACE SOIL TARGETED SOURCE
MATERIAL (TSM) EXCAVATION AREAS
 HUGER STREET
 FORMER MANUFACTURED GAS PLANT SITE
 COLUMBIA, SOUTH CAROLINA
 DATE: 05-01-09 FILE NAME: Figure 3-2
 MANAGEMENT AND TECHNICAL RESOURCES, INC.



- LEGEND**
- PREVIOUSLY COMPLETED TEST PIT
 - SURVEYED SUPPLEMENTAL DELINEATION
 - TEST PIT LOCATION
 - FORMER BUS MAINTENANCE FACILITY STRUCTURE
 - M2 META SOIL BORING
 - B-10 MTR SOIL BORING
 - MW-18 EXISTING MONITORING WELL
 - RFM REUSABLE FILL MATERIAL
 - TSM TARGETED SOURCE MATERIAL



CONC
B-3
CURVE PAVEMENT DEPT.

AREA 1

FT BGS.	SOIL TYPE
0-2	SURFACE SOIL
2-6	RFM
6-13	TSM

AREA 3

FT BGS.	SOIL TYPE
0-2	SURFACE SOIL
2-8	RFM
8-10	TSM

AREA 4

FT BGS.	SOIL TYPE
0-2	SURFACE SOIL
2-5	IMPACTED MATERIAL
5-8	RFM
8-16	TSM

AREA 5

FT BGS.	SOIL TYPE
0-2	SURFACE SOIL
2-16	TSM

AREA 6

FT BGS.	SOIL TYPE
0-2	SURFACE SOIL
2-10	TSM

AREA 8

FT BGS.	SOIL TYPE
0-2	SURFACE SOIL
2-6	TSM

AREA 2

FT BGS.	SOIL TYPE
0-2	SURFACE SOIL
2-7	RFM
7-12	TSM

AREA 7

FT BGS.	SOIL TYPE
0-2	SURFACE SOIL
2-8	RFM
8-22	TSM

AREA 9

FT BGS.	SOIL TYPE
0-2	SURFACE SOIL
2-4	RFM
4-16	TSM

FIGURE 4-3
SOUTH CAROLINA
ELECTRIC & GAS COMPANY
SUBSURFACE EXCAVATION AREA DETAILS
 HUGER STREET
 FORMER MANUFACTURED GAS PLANT SITE
 COLUMBIA, SOUTH CAROLINA
 DATE: 03/03/09 FILE NAME: FIGURE 4-3
 MANAGEMENT AND TECHNICAL RESOURCES, INC.