3.0 INVESTIGATIVE ACTIVITIES

3.1 Summary of Work Performed

The investigative activities performed in this section were conducted in accordance with the *Site Characterization Plan – Mid South Leasing Property, 112 and 114 Brent Street Work Plan, dated December 2003*, that was submitted to MDEQ and approved in February 2004. The project tasks described in the site characterization plan and conducted in the field included:

1. A geophysical survey of the property at 114 Brent Street to determine areas containing significant quantities of metallic and non-metallic debris and generation of maps showing locations of debris.

2. Installation of soil borings in the filled area utilizing a truck mounted rotary auger drill rig. Collection of soil samples at depths greater than eight feet (8') bgs to determine the depth of PCB impacted soil.

3. Additional direct push and hand auger soil sampling of the MSL Property at 112 and 114 Brent Street to fully delineate the areal extent of PCB impacted soil.

4. Direct push and hand auger soil sampling of adjacent and down gradient properties to the south of the MSL Property including the drainage ditch to Turkey Creek to determine whether PCB-containing soils and sediments had migrated from the MSL Property, and if so, to what extent.

5. Excavation of test pits along the slopes of the fill material area on the MSL and Raymond Lamar, Sr. properties to identify visually the types of debris present and to collect soil samples from around the debris to determine PCB levels.

Field activities began on March 23, 2004 and were completed May 14, 2004.

3.2 Property and Sample Point Survey

Property owners were originally identified by conducting a search of the tax records on file at the Copiah County Courthouse located in Hazelhurst, MS. It was determined that the data collection activities that would be conducted during this assessment would occur on tracts of property owned by three entities: 1) Mid-South Leasing, 2) Raymond Lamar, Sr. and 3) Raymond Lamar, Jr. A property line survey was conducted for each property. This property line boundary survey indicated that an area of approximately 5,000 square feet has been covered with debris in the northeast corner of the Raymond Lamar, Sr. property.

A registered land surveyor, utilizing a robotic total station to record the horizontal surveyed sample locations and vertical coordinates, also recorded each sample point during all phases of the assessment. The surveyed sample points were mapped to the state plane coordinate system. This information was used to produce the topographic base and sample location maps generated for this investigation.

3.3 Geophysical Survey

Schnabel Engineering of Greensboro, North Carolina conducted the geophysical survey in the filled area of the MSL Property from March 23 through March 25, 2004. The survey included electromagnetic conductivity and earth resistivity studies to identify potential sample points in locations that were clear of buried debris. Results of the geophysical survey were also used to determine the location of the five test pits in areas that were shown to contain significant amount of debris in order to visually identify the type of debris present and determine sample collection points from the soil around the debris.

Prior to initiating collection of geophysical survey data, a 10-foot X-Y survey grid was marked on the filled area. A baseline, designated X=110, was established in an approximate north-south direction along the western outside wall of the house on the property. A second baseline, designated Y=130 and perpendicular to the X=110 baseline, was established along the southern outside wall of the house. A grid was established for the remainder of the site using these baseline control points. After completion of the geophysical surveys, selected points indicating the limits of the data collection areas were surveyed.

A copy of the geophysical survey is presented in Appendix 2.

3.3.1 Electromagnetic Conductivity Survey

The electromagnetic conductivity survey was conducted on March 23, 3004. Schnabel Engineering, using a Geonics EM-31 terrain conductivity meter operated in the vertical dipole mode, collected the conductivity and in-phase data.

The electromagnetic conductivity data collected indicated that the filled area has a higher conductivity than the surrounding in-situ soil and rock. The higher in-phase conductivity data results show anomalies caused by concentrations of buried metal objects. These results do not show the locations of all buried metal, such as relatively small, very shallowly buried objects and metal that is deeper than the detection limit of the EM-31 instrumentation (approximately 18 feet bgs).

3.3.2 2D Resistivity Model Survey

The 2D resistivity survey was conducted on March 24 and 25, 2004. Resistivity data was collected using a Sting/Swift Resistivity System along four (4) lines placed in the landfill area. This system consists of a resistivity meter, a control unit, and an array of 28 electrodes. The electrodes were spaced at 7.5-foot intervals for a total array length of

202.5 feet and resistivity data was collected using the dipole-dipole method. The array length provided resistivity data to an approximate depth of 40-50 feet bgs.

The 2D resistivity survey data collected indicated that the majority of the filled area had less resistive or more conductive areas than the surrounding soils indicating areas of non-conductive debris such as concrete or rock, or the edge of the filled area.

3.4 Drilling and Soil Sampling

The installation of soil borings in the filled area on the MSL Property was conducted from March 31, 2004 to April 2, 2004. A total of 10 soil borings were advanced into the filled area using a truck-mounted rotary auger drill rig. The borings were placed in strategic locations in areas that were shown in the results of the geophysical survey to be relatively clear of underground debris. Auger refusal was encountered at one location and the borehole was relocated six feet to the west and successfully completed. Photographic documentation of hollow-stem auger boring installation activities is presented in the Appendix 1.

Borings were advanced using a rotary auger with a pneumatic hammer to depths ranging from 17 feet to 25 feet bgs depending on the depth of the fill material at each boring location. Boring activity in each location was ceased when native soil was visually identified in the split spoon sampler. The soils considered to be native and not part of the fill material were red to orange sands with gravel deposits. Boring logs are presented in Appendix 3.

At each sampling location within the borehole, a split-spoon sampler was lowered through the hollow-stem auger and driven into the soil with a 140-pound weight. The split-spoon sampler was removed from the borehole and the soil sample was collected and logged. Soil samples were collected at depths from 8 feet to 22 feet bgs depending on the depth of the fill material. Samples were homogenized, placed in a clean 4-ounce

amber glass jar and delivered to the on-site laboratory, under proper Chain of Custody, for analysis for PCB content. A total of 28 soil samples, including blind duplicates, were collected from the 10 borings. Boring locations and corresponding analytical data results are presented in Figure 5.

3.5 Direct Push and Hand Auger Soil Sampling

Additional site characterization assessment activities to determine the potential for PCB migration and vertical and horizontal impact included collection of soil and sediment samples on the MSL Property and properties adjacent to and down gradient of the MSL Property utilizing Geoprobe™ direct push and hand augers. These additional soil and sediment sampling activities were conducted during the period from April 13, 2004 through May 14, 2004. Photographic documentation of direct push and hand auger sampling activities is presented in the Appendix 1.

The horizontal and vertical extent of PCB contamination in soil and sediment was determined by:

- Collecting surface and subsurface soil and sediment deposition samples;
- Analyzing samples by field laboratory; and,
- Analyzing selected samples by an offsite laboratory to confirm results of the on-site laboratory.

A total of 131 direct push or hand auger soil and/or sediment samples, including duplicates, were collected from 46 separate locations on the MSL Property. A total of 257 soil and/or sediment samples, including duplicates, were collected from 99 separate locations on the Raymond Lamar, Sr. property. Raymond Lamar, Jr. owns the property south of the Raymond Lamar, Sr. tract and down gradient of the MSL Property. The outfall from the drainage ditch on the Raymond Lamar, Sr. property enters into Turkey Creek near its boundary with the Raymond Lamar, Jr. property. A total of three (3)

sediment deposition samples were collected in Turkey Creek near the mouth of the drainage ditch outfall point.

Each sample location was surveyed utilizing a robotic total station to locate each sample point that was then mapped on the state plane coordinate system. A registered land surveyor laid out all of the necessary baselines for control.

Each sample point was assigned a unique location number based on the survey. The extent of PCB-contaminated soil and sediment in the study area was determined by sampling soil and sediment in all directions of the filled area. Samples were collected vertically through the subgrade from each location until the PCB concentration was below the on-site laboratory's detection limit of 0.10 mg/Kg PCB.

Sample points were located immediately down gradient of the MSL Property on a grid with points no greater than 20 feet apart. The grid was extended on all sides of each sample point when analytical results indicated that the sample from that location exceeded the MDEQ regulatory limit of 1.0 mg/Kg of PCB. The grid was extended until the soil collected from two sample points (a minimum of 40 feet) was less than 1.0 mg/Kg PCB.

Once in the drainage ditch and beyond the influence of sheet flow runoff from the MSL Property, the ditch was sampled along perpendicular transects spaced downstream 50 feet apart until PCB concentrations dropped below 1.0 mg/Kg for a minimum of 50 feet on all sides of any sample point that exceeded 1.0 mg/Kg PCB. A map showing sample locations and corresponding analytical data results is presented as Figure 6.

3.6 Test Pits

Excavation of the test pits was conducted during the period of May 10, 2004 through May 13, 2004. A trackhoe was used to excavate a total of five test pits. These test pits

were placed in locations on the steep embankment fill slope in areas determined by the geophysical survey results to contain a significant amount of debris. The test pits were excavated to a width of 24-36" and varying depths depending on the presence of visible quantities of debris. Prior to excavation, a surface soil sample was collected from the top of the embankment in each location where the test pit was to be placed. The location of the test pits and corresponding analytical results are presented in Figure 4.

Material removed from the test pit was stockpiled on plastic sheeting and replaced in the excavation when trenching was complete. Each test pit was logged and photographed by the field environmental scientist. Soil samples were collected from the trackhoe bucket at varying depths. A sample was also collected from the bottom of each test pit. A total of 32 soil samples, including duplicates, were collected from the test pits. Samples were transported, under proper Chain of Custody, to the on-site laboratory for analysis of PCB content. Upon completion of each test pit, the liner was replaced over the backfilled trench and thermally sealed.