UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
Science and Ecosystem Support Division
Enforcement and Investigations Branch
980 College Station Road
Athens, Georgia 30605-2720

4SESD-EIB January 31, 2011

MEMORANDUM

SUBJECT: SESD Final Field Investigation Report for
Hercules Inc., Hattiesburg, Mississippi
EPA ID No. MSD 008 182 081; SESD Project No. 10-0629

FROM: Sharon Matthews, PG
Enforcement Section

THRU: Laura Ackerman, Chief
Enforcement Section

TO: Larry Lamberth, Chief
South Enforcement and Compliance Section
RCRA & OPA Enforcement and Compliance Branch
RCRA Division

Attached is the final Field Investigation Report for the sampling conducted at Hercules Inc. in Hattiesburg, Mississippi on September 28-29, 2010. If you have any questions, please contact me at matthews.sharon@epa.gov. or at (706) 355-8608.

Attachment

Randy Jackson, RCRA w/attachment
Willie McKercher, MDEQ w/attachment
Jan Patton, MDEQ w/ attachment

United States Environmental Protection Agency
Region 4
Science and Ecosystem Support Division
980 College Station Road
Athens, Georgia 30605-2720

Field Investigation Report
Hercules Inc.
Hattiesburg, Mississippi

Date of Final Report: January 31, 2011
SESD Project Identification Number: 10-0629

Requestor: Randy Jackson
South Enforcement & Compliance Section
RCRA & OPA ECB, RCRA Division
61 Forsyth Street, SW
Atlanta, GA 30303-8960

SESD Project Leader: Sharon Matthews
SESD Enforcement Section
980 College Station Road
Athens, Georgia 30605-2720

Title and Approval Sheet

Title: Hercules Inc.
Field Investigation Report

Approving Official:

Laura Ackerman 01/31/11

Laura Ackerman, Section Chief — Date
Enforcement Section
Enforcement and Investigations Branch

SESD Project Leader:

Sharon Matthews 1/31/11

Sharon Matthews, PG — Date
Enforcement Section
Enforcement and Investigations Branch

FIELD INVESTIGATION REPORT
Hercules Inc., Hattiesburg, Mississippi
SESD Project Identification Number: 10-0629

I. INTRODUCTION

On September 28-29, 2010, representatives of the Science and Ecosystem Support Division (SESD) conducted a sampling investigation at the Hercules Inc. facility in Hattiesburg, Mississippi. This field investigation was requested by the EPA South Enforcement & Compliance Section, RCRA Division and the Mississippi Department of Environmental Quality (MDEQ) as part of the EPA Surface Impoundment Initiative.

In April 2008, Hercules Inc. informed the MDEQ that an onsite impoundment basin was to be closed. MDEQ requested additional information on closure operations including a request for Hercules to characterize the sludge. After three sampling events, the results indicated some areas of the sludge exhibited hazardous characteristics for benzene. A notice of violation (NOV) was issued in November 2008 to the facility.

MDEQ contacted the EPA to see if they would conduct sampling and analysis of the sludge disposal area from prior surface impoundment clean-outs to determine if illegal disposal had occurred. The sludge disposal area is located on the 'back forty" of the facility's 170 acres, and spans an area of 6 to 7 acres.

Personnel that participated in the investigation included:

Randy Jackson	EPA Region 4-Atlanta, GA	(404) 562-8464
Paula Whiting	EPA Region 4-Atlanta, GA	(404) 562-9277
Araceli Bonilla	EPA Region 4-Atlanta, GA	(404) 562-9790
Jan Patton	MDEQ – Jackson, MS	(601) 961-5782
Willie McKercher	MDEQ – Jackson, MS	(601) 961-5731
Gloria Tatum	MDEQ – Jackson, MS	(601) 961-5011
Rick Sumrall	MDEQ – Jackson, MS	(601) 961-5791
Charles Jordan	Hercules- Hattiesburg, MS	(601) 584-3360
Kipper Montgomery	Arcadis – Baton Rouge, LA	(225) 292-1004
Kevin Simmons	EPA Region 4-Athens, GA	(706) 355-8730
Art Masters	EPA Region 4-Athens, GA	(706) 355-8612
Bill Simpson	EPA Region 4- Athens, GA	(706) 355-8748
Marty Allen	EPA Region 4-Athens, GA	(706) 355-8651
Sharon Matthews	EPA Region 4-Athens, GA	(706) 355-8608

II. SUMMARY

SESD collected a total of thirteen subsurface waste samples, twelve from the "back forty" area and one from the "wetlands" area. Samples were analyzed for volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), metals and TCLP. MDEQ and EPA requested the analytical data be compared to residential levels for soil given in the Tier 1 Target Remediation Goals (TRGs) and the most recent USEPA Regional Screening levels (RSLs).

Eighteen volatile organic compounds were detected in the thirteen samples. Benzene failed the TCLP regulatory limit of 0.5 mg/L in six of the samples and was detected in ten samples. Toluene and p-isopropyltoluene were detected in all thirteen samples. Methylcyclohexane and 1, 2, 4-trimethylbenzene were detected in eleven samples and. Cyclohexane was detected in nine samples and ethyl benzene was detected in eight samples. The remainder of the VOCs were detected in six or less of the samples.

Forty SVOCs were detected in the thirteen samples. None of the SVOCs failed TCLP for the thirteen samples. The compound 1, 1-biphenyl was detected in twelve of the thirteen samples and petroleum product was detected in eleven of the samples. Phenol, hexahydro-tetramethylmethanonaphthalene (TIC) and dimethylisopropylphenanthrene (TIC) were detected in ten of the samples. Nine samples contained camphene, 2-methylnaphthalene, and naphthalene. Eight of the samples contained diphenyl ether (TIC), (3-and/or 4) methylphenol, methyl (methylethyl) benzene (TIC), methyl (methylethyl)cyclohexane (TIC), and trimethyl-bicycloheptane (TIC). Seven of the samples contained 2-methylphenol, fluoranthene and pinene (TIC). The remainder of the SVOCs were detected in six or less of the samples.

Twenty-two metals were detected in the thirteen samples with seventeen detected in all of the samples. Arsenic was detected in samples HERC04-B, HERC05-A, HERC10-B and HERC13-B at levels that exceeded both the MDEQ and EPA regulatory levels with values ranging from 5.0 to 6.4 mg/kg. None of the samples exceeded the MDEQ and EPA regulatory levels for Chromium III; however, all of the samples exceeded the EPA regulatory level of 0.29 mg/kg for Chromium VI. Vanadium was detected in samples HERC03-B, HERC04-B, HERC05-A, HERC08, HERC09-B, HERC10-B, HERC11-B, HERC12-B and HERC13-B at levels that exceeded the EPA regulatory level of 5.5 mg/kg with values ranging from 5.6 to 18 mg/kg. No other metal concentrations exceeded the MDEQ and EPA regulatory levels. None of the metals failed TCLP for the thirteen samples.

III. SITE BACKGROUND

The facility is located at 613 West Seventh Street in Hattiesburg, Mississippi (Figure 1). Facility operations, which began in 1923, included wood grinding, shredding extraction, fractionation, refining, distillation and processing of rosin from pine tree stumps. Some of the products that were manufactured included modified resins, polyamides, ketene dimmer, crude tall oil wax emulsions, synthetic rubber and the agricultural pesticide Delnav. Hercules also manufactured specialty organic chemicals for use in paper products. Over 250 products were produced at the facility. Hercules downsized the Hattiesburg operations and has now ceased operations.

A state preliminary assessment was completed in December 1989 and indicated two source areas which included about 38 acres of contaminated soil and almost 900,000 cubic feet of surface impoundments. The contaminated soil contained cadmium, cobalt, lead, mercury, toluene, MEK, benzene, PCBs and acetone. Contaminants present in the surface impoundments included arsenic, heavy metals, toluene, MEK and benzene.

In April 2008 the facility sent a letter to MDEQ to close an onsite impoundment basin. MDEQ requested additional information on closure operations including a request for Hercules to characterize the sludge. After three sampling events, the results indicated some areas of the

sludge exhibited hazardous characteristics for benzene. A notice of violation (NOV) was issued November 2008. Prior surface impoundment clean-outs had been taken to a landfill disposal area located on the 'back forty" of the facility's 170 acres, spanning an area of 6 to 7 acres. According to information from MDEQ, the "back forty" had been used to dispose of process wastes, boiler ash and waste treatment sludge from plant activities. A compliance evaluation inspection conducted by MDEQ in March 2009 resulted in several violations involving the surface impoundment and closure/post-closure procedures. MDEQ then requested EPA's assistance in sampling and testing the sludge disposal area to determine if illegal disposal had occurred.

IV. DISSCUSSION OF FIELD ACTIVITIES

SESD personnel arrived at the site Tuesday, September 28, 2010 at around 7:45 am and met with EPA-Atlanta, MDEQ and facility personnel to assess the proposed sampling areas. Using an authoritative sampling design, sampling locations were determined in the field by MDEQ and EPA personnel based on access and prior knowledge of the site. Twelve borings were completed using Geoprobe direct-push technology or hand auger in the 'back forty" disposal area. Total depth of the sludge had been estimated to be around 14 to 16 feet below land surface but was actually closer to 5 to 8 feet in depth. Two samples had been proposed from the wetlands, but only one could be collected due to the high quantity of vegetative material/roots. Two samples had been proposed from the impoundment outfall, but those sample locations were deleted and added to the samples to be collected from the "back forty". Samples from the sludge disposal area were collected based on visual observations and screening results obtained with the Thermo Toxic Vapor Analyzer (TVA) 1000B. All samples were analyzed for VOCs, SVOCs, metals and TCLP. Table 1 gives information on the waste samples. Sampling locations are shown on Figures 3, 4 and 5. Photographs taken during the investigation are included in Appendix A.

Waste Samples

Under the direction of EPA-Atlanta and MDEQ personnel, sample **HERC01-A** was collected from the "back forty" using Geoprobe direct-push equipment to a depth of 0 to 4 feet below land surface (BLS). The core was screened with a Thermo Toxic Vapor Analyzer (TVA) 1000B. The sample was described as a black organic rich material with a strong odor of pine. The waste sample core was placed in a glass pan and using a stainless steel spoon, three 8-ounce glass containers were filled for the VOC, SVOC and total metals analyses. The VOC sample was collected first, and then the remainder of the sample was homogenized in the glass pan. The facility elected to split with EPA for all samples and supplied one 4-ounce amber glass container for VOCs, one 16-ounce glass container for SVOCs and one 8-ounce plastic container for metals.

For sample **HERC02-B,** a stainless steel hand auger was used to auger to 5 feet BLS. The waste sample was collected from 3.5 to 5 feet BLS and was described as a tan to black sticky material. EPA and facility containers were filled for the VOC, SVOC and total metals analyses using the same procedure described above.

Sample **HERC03-B** was also collected with a stainless steel hand auger from some of the oldest part of the "back forty" sludge disposal area. The waste sample was collected from 4 to 5 feet BLS and was described as a black organic material with a strong odor, sandier at depth. Native material of sand and gravel was noted at about 6 feet BLS. EPA and facility containers were filled for the same analyses using the same procedure described above.

Sample **HERC04-B** was collected with a stainless steel hand auger from the older part of the "back forty" sludge disposal area. The waste sample was collected from 6 to 7 feet BLS and was described as a black organic material with some odor. EPA and facility containers were filled for the same analyses using the same procedure described previously.

Sample **HERC05-A** was collected with a stainless steel hand auger from the older part of the "back forty" sludge disposal area. The waste sample was collected from 5.5 to 6.5 feet BLS and was described as a dark organic sludge with a strong odor. EPA and facility containers were filled for the same analyses using the same procedure described before.

Sample **HERC06-B** was collected with a stainless steel hand auger from 4.5 to 5.5 feet BLS and was described as a dark gray to black sludge with a strong odor, drier material at the surface that became moister and sandier with depth. The sand that was encountered at 5.5 to 6 feet BLS is the sand layer that sits on top of the Hattiesburg clay in this area, indicating native material. EPA and facility containers were filled for the same analyses using the same procedure described previously.

Sample **HERC07-B** was collected with a stainless steel hand auger from 5.5 to 6 feet BLS and was described as a drier dark organic material which became moister with depth. EPA and facility containers were filled for the same analyses using the same procedure described before.

Sample **HERC08** was collected with a stainless steel scoop from the "wetlands" area from a depth of about 3 to 4 inches. The material was mostly cat-tails and detritus with some stratified sludgy material with no odor. Two samples had been proposed from the wetlands, one around the influent and one from the effluent, but only the influent sample could be collected due to the high amount of vegetative material/roots around the effluent area. EPA and facility containers were filled for the same analyses using the same procedure described previously.

Sample **HERC09-B** was collected from the "back forty" using Geoprobe direct-push equipment. The first core was 0 to 4 feet BLS and was a black organic material. The second core was collected from 4 to 8 feet BLS and was black sludge for the first foot, then native sand. Because the core was compacting inside the core barrel, it was decided to hand auger this and subsequent samples to collect enough material to fill all the EPA and facility sample containers. The sample was collected from 5 to 6 feet BLS and described as a black sludge material. EPA and facility containers were filled for the same analyses using the same procedure described before.

Sample **HERC10-B** was collected with a stainless steel hand auger from 5 to 6 feet BLS. Native sand was encountered at 6 feet BLS. The black sludge sample was collected above the sand and some odor was noted during sampling. EPA and facility containers were filled for the same analyses using the same procedure described previously.

Sample **HERC11-B** was collected with a stainless steel hand auger from 5 to 6 feet BLS. Native sand was encountered at 6 feet BLS. The sample was collected above the sand and was described as a black organic sludge with some odor. EPA and facility containers were filled for the same analyses using the same procedure described before.

Sample **HERC12-B** was collected with a stainless steel hand auger from 4.5 to 5.5 feet BLS. Native sand was encountered at 5.5 feet BLS. The sample was collected above the sand and was described as a black sludge with some odor. EPA and facility containers were filled for the same analyses using the same procedure described previously.

Sample **HERC13-B** was collected with a stainless steel hand auger from 4.5 to 5.5 feet BLS. Native sand was encountered at 5.5 feet BLS. The sample was collected above the sand and was described as a black sludge material with a strong odor and an oily sheen. EPA and facility containers were filled for the same analyses using the same procedure described before.

V. RESULTS OF ANALYSES

Samples were analyzed for VOCs by SW-846 Methods 8260C, for SVOCs by SW-846 Method 8270D and for total metals by SW-846 Method 6010. Analytical results for the VOC-detected analytes in the waste samples are given in Table 2 and the TCLP results are given in Table 3. The MDEQ Tier 1 TRG and EPA Regional Screening Levels (RSLs) for VOCs in residential soils are listed in Table 4. Results for the SVOC-detected analytes are given in Table 5. Because no compounds failed TCLP for SVOCs, there is no TCLP table. The MDEQ Tier 1 TRG and EPA RSLs for SVOCs in residential soils are listed in Table 6. Analytical results for total metals are given in Table 7 and the MDEQ Tier 1 TRG and EPA RSLs for metals are given in Table 8. Because no compounds failed TCLP for metals, there is no TCLP table. The complete set of results generated by the SESD laboratory is included as Appendix B. The following analytes were detected in samples collected at the facility:

Volatile Organic Compounds- (Tables 2, 3 and 4)

Eighteen volatile compounds were detected in the thirteen samples **(Table 2)**. Toluene and p-isopropyltoluene were detected in all thirteen samples. Methylcyclohexane and 1,2,4-trimethylbenzene were detected in eleven samples and benzene was detected in ten samples. Cyclohexane was detected in nine samples and ethyl benzene was detected in eight samples. The remaining VOCs were detected in six or less of the samples. Benzene failed the TCLP regulatory limit of 0.5 mg/L in six of the samples **(Table 3)**. Analytical data was compared to the MDEQ and EPA regulatory levels referenced in **Table 4.** Exceedences are listed below:

HERC01-A - *Analytes exceeding the reference standard or level*: benzene (18 mg/kg), toluene (7100 mg/kg)

HERC02-B - *Analytes exceeding the reference standard or level*: benzene (37 mg/kg), ethyl benzene (6.5 J, O mg/kg), toluene (16000 mg/kg)

HERC03-B - *Analytes exceeding the reference standard or level*: benzene (3.4 mg/kg)

HERC04-B - *Analytes exceeding the reference standard or level*: benzene (19 mg/kg), toluene (3000 mg/kg)

HERC05-A - *Analytes exceeding the reference standard or level*: benzene (14 mg/kg), toluene (5300 mg/kg)

HERC06-B - *Analytes exceeding the reference standard or level*: toluene (280 mg/kg)

HERC07-B - *Analytes exceeding the reference standard or level*: toluene (1400 mg/kg)

HERC08 - *Analytes exceeding the reference standard or level*: none

HERC09-B - *Analytes exceeding the reference standard or level*: benzene (170 mg/kg), toluene (1100 mg/kg)

HERC10-B - *Analytes exceeding the reference standard or level*: benzene (140 mg/kg), toluene (3100 mg/kg)

HERC11-B - *Analytes exceeding the reference standard or level*: benzene (77 mg/kg), toluene (2600 mg/kg)

HERC12-B - *Analytes exceeding the reference standard or level*: benzene (440 mg/kg), isopropylbenzene (47 mg/kg), toluene (160 mg/kg)

HERC13-B - *Analytes exceeding the reference standard or level*: benzene (390 mg/kg), toluene (3400 mg/kg)

Semi Volatile Organic Compounds (Tables 5 and 6)

Forty SVOCs were detected in the thirteen samples **(Table 5)**. The compound 1,1-biphenyl was detected in twelve of the thirteen samples and petroleum product was detected in eleven of the samples. Phenol, dimethylisopropylphenanthrene (TIC), and hexahydro-tetramethylmethanonaphthalene (TIC) were detected in ten of the samples. Nine samples contained 2-methylnaphthalene, camphene and naphthalene. Eight of the samples contained diphenyl ether (TIC), (3-and/or 4) methylphenol, methyl(methylethyl)benzene (TIC), methyl(methylethyl)cyclohexane (TIC), and trimethylbicycloheptane (TIC). Seven of the samples contained 2-methylphenol, fluoranthene and pinene (TIC). The remainder of the SVOCs were detected in six or less of the samples. None of the SVOCs failed TCLP for the thirteen samples. Analytical data was compared to the MDEQ and EPA regulatory levels referenced in **Table 6.** Exceedences are listed below:

HERC01-A - *Analytes exceeding the reference standard or level*: naphthalene (6.2 mg/kg)

HERC02-B - *Analytes exceeding the reference standard or level*: 1,1-biphenyl (3900 mg/kg), naphthalene (8.8 mg/kg)

HERC03-B - *Analytes exceeding the reference standard or level*: none

HERC04-B - *Analytes exceeding the reference standard or level*: naphthalene (7.8 mg/kg)

HERC05-A - *Analytes exceeding the reference standard or level*: naphthalene (8.7 mg/kg)

HERC06-B - *Analytes exceeding the reference standard or level*: none

HERC07-B - *Analytes exceeding the reference standard or level*: none

HERC08 - *Analytes exceeding the reference standard or level*: none

HERC09-B - *Analytes exceeding the reference standard or level*: none

HERC10-B - *Analytes exceeding the reference standard or level*: naphthalene (6.7 mg/kg)

HERC11-B - *Analytes exceeding the reference standard or level*: none

HERC12-B - *Analytes exceeding the reference standard or level*: naphthalene (3.9 mg/kg)

HERC13-B - *Analytes exceeding the reference standard or level*: naphthalene (5.2 mg/kg)

Metals (Tables 7 and 8)

Twenty-two metals were detected in the thirteen samples **(Table 7)**. Seventeen of the metals were detected in all of the samples. Arsenic was detected in samples HERC04-B, HERC05-A, HERC10B and HERC13-B at levels that exceeded both the MDEQ and EPA regulatory levels with values ranging from 5.0 to 6.4 mg/kg. None of the samples exceeded the MDEQ and EPA regulatory levels for Chromium III; however, all of the samples exceeded the EPA regulatory level of 0.29 mg/kg for Chromium VI with values ranging from 7.7 to 45 mg/kg. Vanadium was detected in samples HERC03-B, HERC04-B, HERC05-A, HERC08, HERC09-B, HERC10-B, HERC11-B, HERC12-B and HERC13-B at levels that exceeded the EPA regulatory level of 5.5 mg/kg with values ranging from 5.6 to 18 mg/kg. No other metal concentrations exceeded the MDEQ and EPA regulatory levels. None of the metals failed TCLP for the thirteen samples. Analytical data was compared to the MDEQ and EPA regulatory levels referenced in **Table 8.** Exceedences are listed below:

HERC01-A - *Analytes exceeding the reference standard or level*: chromium VI (24 mg/kg)

HERC02-B - *Analytes exceeding the reference standard or level*: chromium VI (11 mg/kg)

HERC03-B - *Analytes exceeding the reference standard or level*: chromium VI (7.7mg/kg), vanadium (8.7 mg/kg)

HERC04-B - *Analytes exceeding the reference standard or level*: arsenic (6.4 mg/kg), chromium VI (29 mg/kg), vanadium (5.6 mg/kg)

HERC05-A - *Analytes exceeding the reference standard or level*: arsenic (5.6 mg/kg), chromium VI (45 mg/kg), vanadium (6.6 mg/kg)

HERC06-B - *Analytes exceeding the reference standard or level*: chromium VI (20 J,O mg/kg)

HERC07-B - *Analytes exceeding the reference standard or level*: chromium VI (32 mg/kg)

HERC08 - *Analytes exceeding the reference standard or level*: chromium VI (20 mg/kg), vanadium (18 mg/kg)

HERC09-B - *Analytes exceeding the reference standard or level*: chromium VI (20 mg/kg), vanadium (5.9 mg/kg)

HERC10-B - *Analytes exceeding the reference standard or level*: arsenic (5.0 mg/kg), chromium VI (26 mg/kg), vanadium (7.6 mg/kg)

HERC11-B - *Analytes exceeding the reference standard or level*: chromium VI (25 mg/kg), vanadium (7.2 mg/kg)

HERC12-B - *Analytes exceeding the reference standard or level*: chromium VI (18 mg/kg), vanadium (7.5 mg/kg)

HERC13-B - *Analytes exceeding the reference standard or level*: arsenic (5.6 mg/kg), chromium VI (36 mg/kg), vanadium (9.0 mg/kg)

VI. RESULTS OF FIELD QUALITY CONTROL SAMPLES

Field quality control samples for this investigation consisted of equipment rinse blanks collected from the liners used for the Geoprobe cores. No VOCs, SVOCs or metals were detected in the blanks. No metals were detected in the blank of the preservative used for the equipment rinse blank for metals analysis.

VII. METHODOLOGY

Field activities were conducted in accordance with the Region 4 SESD *Field Branches Quality System and Technical Procedures.* Specific field procedures applicable to this investigation included the following:

Soil Sampling, SESDPROC-300-R1
Waste Sampling SESDPROC-302-R1

Sediment Sampling, SESDPROC-200-R2
SESD Operating Procedure for Sample and Evidence Management, SESDPROC-005-R1
Global Positioning System, SESDPROC-110-R2
Management of Investigation Derived Waste, SESDPROC-202-R1
Field Equipment Cleaning and Decontamination, SESDPROC-205-R1
Packing, Marking, Labeling and Shipping of Environmental & Waste Samples, SESDPROC-209-R1

Field quality control measures were in accordance with the *SESD Operating Procedure for Field Sampling Quality Control,* SESDPROC-011-R2, and *40 CFR Part 136, Table II-Required Containers, Preservations Techniques, and Holding Times*, Revised as of July 1, 2007. All field measurement instruments and equipment were maintained in accordance with the *SESD Operating Procedure for Equipment Inventory and Management,* SESDPROC-108-R3.

Samples were analyzed at the SESD laboratory in accordance with the *SESD Analytical Support Branch Laboratory Operations and Quality Assurance Manual*, January 2010. The laboratory is accredited by the national Environmental Laboratory Accreditation Program (NELAP).

REFERENCES

Personnel communication: Kevin Koporec to Sharon Matthews regarding RSLs, 1/19/11

"Site Inspection" for Hercules Inc. prepared by B&V Waste Science and Technology Corp. for the US EPA Region 4. April, 1993.

USEPA Regional Screening Levels (11/10)

Mississippi Department of Environmental Quality Tier 1 TRG Table (2/28/02)

FIGURE 1 – FACILITY LOCATION MAP
HERCULES, INC.
HATTIESBURG, MISSISSIPPI

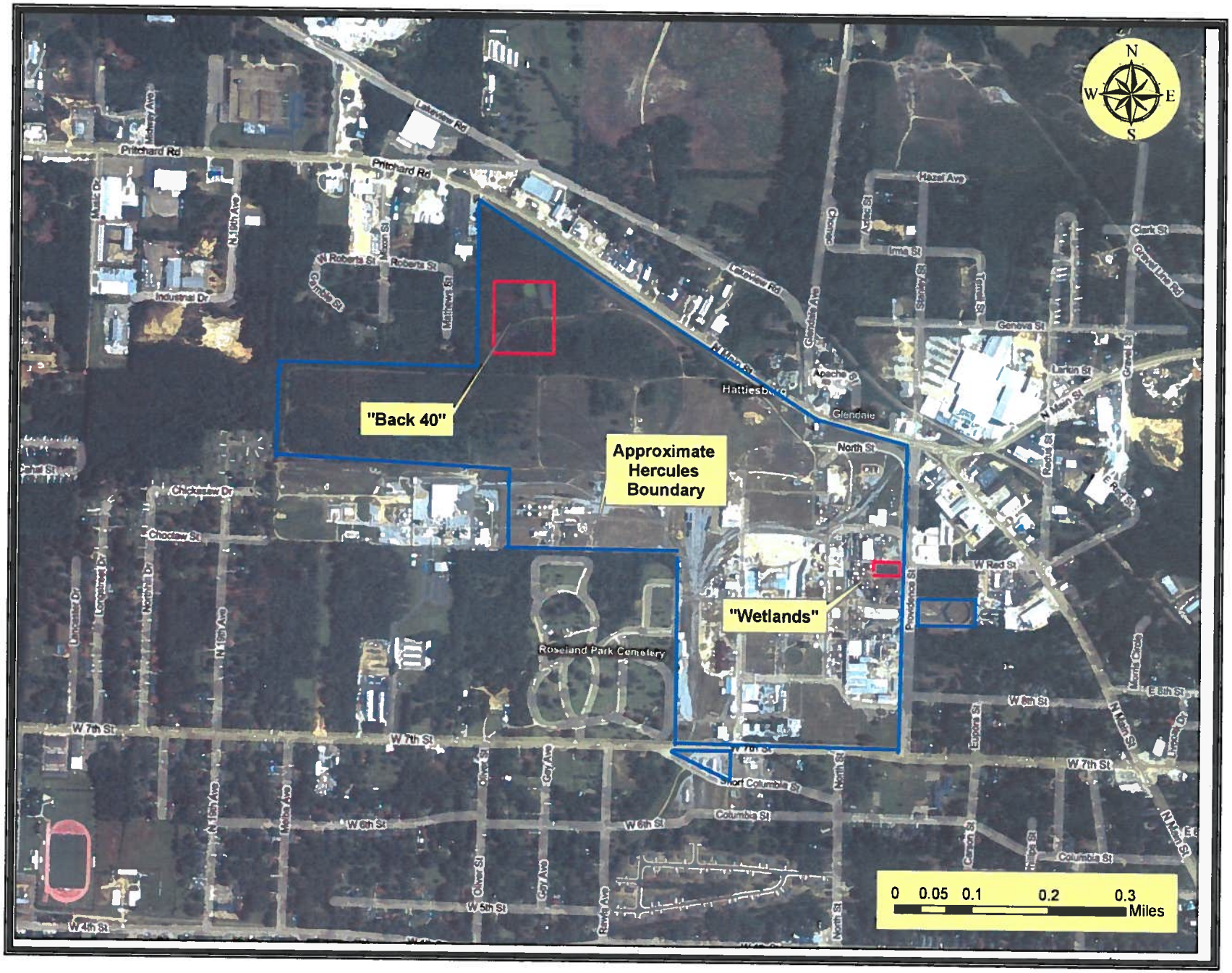


FIGURE 2 –SITE LOCATION MAP
HERCULES, INC., HATTIESBURG, MISSISSIPPI

SESD PROJECT NO. 10-0629

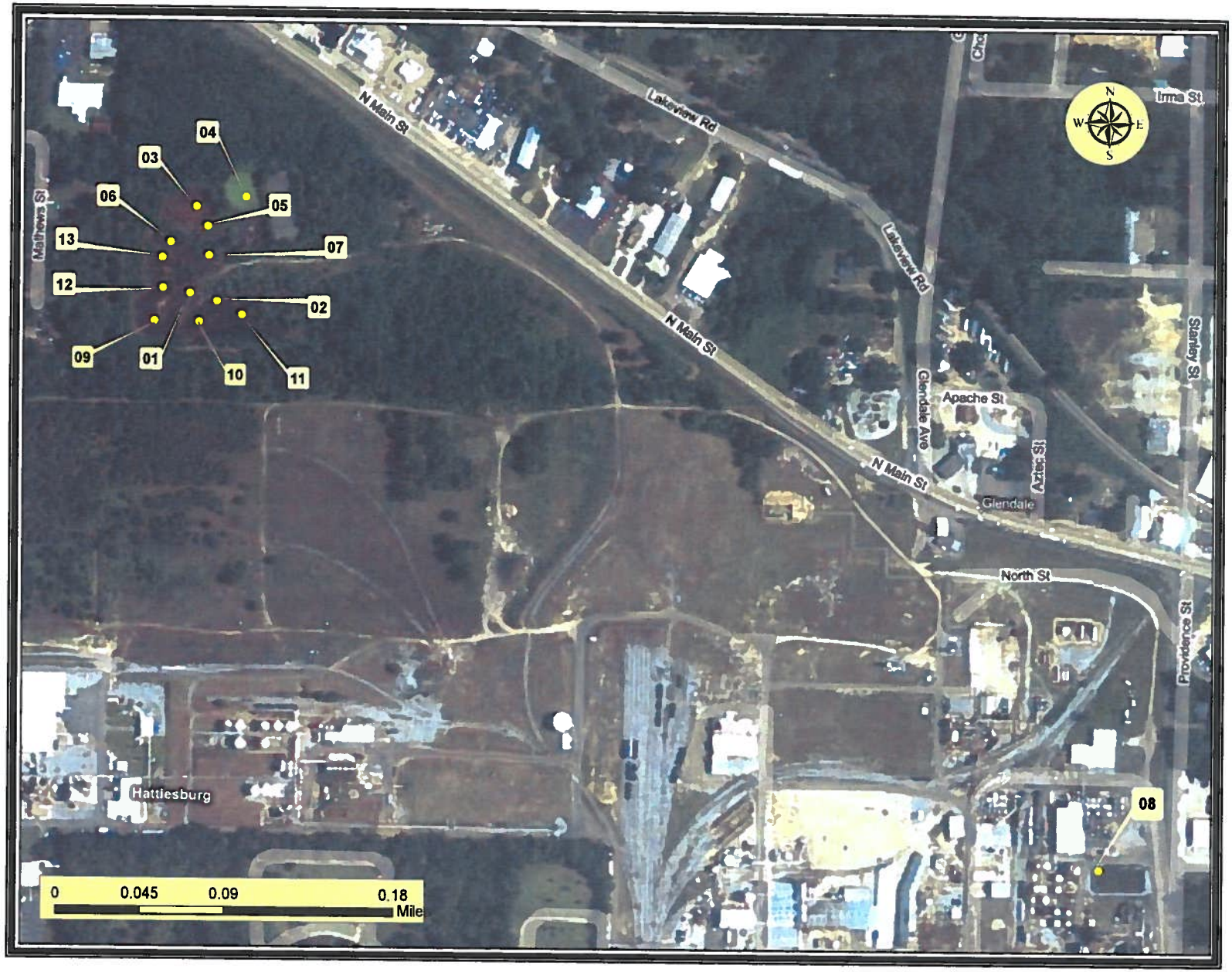


FIGURE 3 – SAMPLE LOCATIONS
HERCULES, INC., HATTIESBURG, MISSISSIPPI

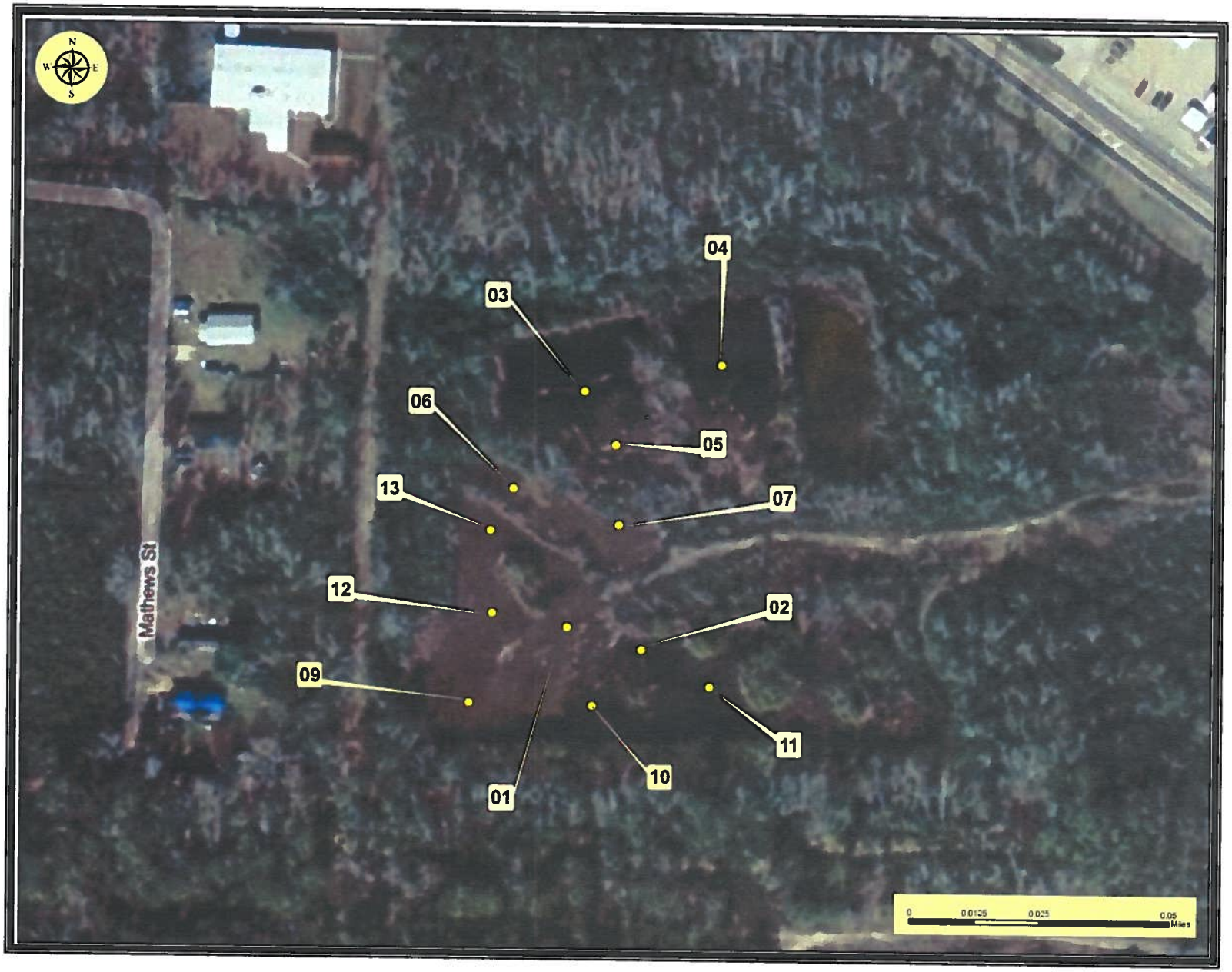


FIGURE 4 – "BACK 40" SAMPLE LOCATIONS – Expanded view
HERCULES, INC., HATTIESBURG, MISSISSIPPI

FIGURE 5 – "WETLANDS" SAMPLE LOCATION – Expanded view
HERCULES, INC., HATTIESBURG, MISSISSIPPI

TABLE 1
SAMPLE DESCRIPTIONS
HERCULES INC. – HATTIESBURG, MISSISSIPPI

Station ID	Sample ID	Media Code	Sample Date	Latitude	Longitude	Sample Description	Sample Interval (BLS)/ Sample Method
HERC01	HERC01-A	WA	9/28/10	31.34350	89.31332 ±10'	Black organic rich material; very strong odor; pine smell	0 to 4 feet - Geoprobe
HERC02	HERC02-B	WA	9/28/10	31.34344	89.31308 ±13'	Tan to black sticky material	3.5 to 5 feet – hand auger
HERC03	HERC03-B	WA	9/28/10	31.34417	89.31328 ±16'	Oldest material in "back 40": black organic material; strong odor; sandier at depth	4 to 5 feet – hand auger
HERC04	HERC04-B	WA	9/28/10	31.34425	89.31284 ±15	Back organic material; some odor	6 to 7 feet – hand auger
HERC05	HERC05-A	WA	9/28/10	31.34402	89.31318 ±11'	Dark organic sludge; strong odor	5.5 to 6.5 feet – hand auger
HERC06	HERC06-B	WA	9/28/10	31.34389	89.31351 ±12'	Drier material; dark gray to black sludge; strong odor; moister & sandier w/depth	4.5 to 5.5 feet – hand auger
HERC07	HERC07-B	WA	9/28/10	31.34380	89.31316 ±10'	Drier dark organic material; moister w/depth	5.5 to 6 feet – hand auger
HERC08	HERC08	WA	9/29/10	31.33928	89.30500 ±12'	Only "wetland" sample; mostly cat-tails, some sludgy material; no odor	3 to 4 inches - scoop
HERC09	HERC09-B	WA	9/29/10	31.34329	89.31363 ±16'	Black sludge material into sand at 6 feet BLS	5 to 6 feet – tried Geoprobe; had to hand-auger to get enough sample
HERC10	HERC10-B	WA	9/29/10	31.34329	89.31323 ±12'	Hit sand at 6 feet bls; some odor	5 to 6 feet – hand auger
HERC11	HERC11-B	WA	9/29/10	31.34335	89.31285 ±12'	Black organic sludge; some odor; into sand at 6 feet BLS	5 to 6 feet – hand auger
HERC12	HERC12-B	WA	9/29/10	31.34354	89.31357 ±11'	Black sludge; some odor; into sand at 5.5 feet BLS	4.5 to 5.5 feet – hand auger
HERC13	HERC13-B	WA	9/29/10	31.34377	89.31358 ±10'	Black sludge material; strong odor, oily sheen; into sand at 5.5 feet BLS	4.5 to 5.5 feet – hand auger

TABLE 2
Detected Volatile Organic Compounds
Hercules Inc., Hattiesburg, Mississippi

	Station ID	HERC01	HERC02	HERC03	HERC04	HERC05	HERC06
	Sample ID	HERC01-A	HERC02-B	HERC03-B	HERC04-B	HERC05-A	HERC06-B
	Media Code	WA	WA	WA	WA	WA	WA
	Sample Date	9/28/10	9/28/10	9/28/10	9/28/10	9/28/10	9/28/10
Analyte	**Units**						
(m- and/or p-)Xylene	mg/kg	5.1 J,O	U	0.76 J,O	5.8 J,O	4.6 J,O	U
1,2,4-Trimethylbenzene	mg/kg	3.9 J,O	7.0 J,O	2.1	4.6 J,O	4.0 J,O	0.40 J,O
1,2-Dichlorobenzene	mg/kg	U	U	U	25	6.3 J,O	U
Benzene	mg/kg	**18**	**37**	**3.4**	**19**	**14**	U
Carbon disulfide	mg/kg	5.3 J,O	U	U	5.6 J,O	3.6 J,O	0.42 J,O
Cyclohexane	mg/kg	110	190	U	910	420	U
Ethyl Benzene	mg/kg	2.4 J,O	**6.5 J,O**	0.62 J,O	2.2 J,O	2.6 J,O	U
Isopropylbenzene	mg/kg	U	U	U	U	U	U
Methyl Acetate	mg/kg	U	U	0.72 J,O	U	U	U
Methyl Isobutyl Ketone	mg/kg	U	U	U	U	4.6 J,O	U
Methylcyclohexane	mg/kg	6.9 J,O	17 J,O	8.6	20	22	0.24 J,O
n- Butylbenzene	mg/kg	U	U	1.2	U	U	U
o-Xylene	mg/kg	U	U	0.5 J,O	U	U	U
p-Isopropyltoluene	mg/kg	1100	1700	420	3500	3500	38
tert-Butylbenzene	mg/kg	U	U	1.4	U	U	U
Toluene	mg/kg	**7100**	**16000**	0.82 J,O	**3000**	**5300**	**280**
Dimethyloctane (TIC)	mg/kg	U	U	40 NJ	U	U	U
Ethylmethylcyclohexane (TIC)	mg/kg	U	U	20 NJ	U	U	U

Numbers in **BOLD** exceed the USEPA Regional Screening Levels (11/10) and/or values in the MDEQ Tier 1 TRG Table (2/28/02)
J= the identification of the analyte is acceptable; the reported value is an estimate
NJ = Presumptive evidence that analyte is present; reported as a tentative identification (TIC) with an estimated value.
O = other qualifiers have been assigned providing additional information and are defined in the analytical data sheets included as Appendix B of this report
U= the analyte was not detected at or above the reporting limit

TABLE 2 (con't)
Detected Volatile Organic Compounds
Hercules Inc., Hattiesburg, Mississippi

Station ID		HERC07	HERC08	HERC09	HERC10	HERC11	HERC12	HERC13
Sample ID		HERC07-B	HERC08	HERC09-B	HERC10-B	HERC11-B	HERC12-B	HERC13-B
Media Code		WA	WA	WA	WA	WA	WA	WA
Sample Date		9/28/10	9/29/10	9/29/10	9/29/10	9/29/10	9/29/10	9/29/10
Analyte	**Units**							
(m- and/or p-)Xylene	mg/kg	2.9	U	3.2	U	U	U	U
1,2,4-Trimethylbenzene	mg/kg	1.3 J,O	U	3.0	7.0 J,O	U	5.0 J,O	5.5 J,O
1,2-Dichlorobenzene	mg/kg	U	U	U	34	U	U	31
Benzene	mg/kg	U	U	**170**	**140**	**77**	**440**	**390**
Carbon disulfide	mg/kg	0.78 J,O	U	U	U	U	U	U
Cyclohexane	mg/kg	U	U	29	1500	100	48	870
Ethyl Benzene	mg/kg	0.92 J,O	U	1.0 J,O	4.0 J,O	U	U	U
Isopropylbenzene	mg/kg	U	U	U	U	U	**47**	U
Methyl Acetate	mg/kg	U	U	U	U	U	U	U
Methyl Isobutyl Ketone	mg/kg	U	U	U	U	U	U	11 J,O
Methylcyclohexane	mg/kg	U	U	8.2	12 J,O	7.4 J,O	11 J,O	10 J,O
n- Butylbenzene	mg/kg	U	U	U	U	U	U	U
o-Xylene	mg/kg	0.73 J,O	U	1.0 J,O	U	U	U	U
p-Isopropyltoluene	mg/kg	170	2.6	610	3400	720	2400	3100
tert-Butylbenzene	mg/kg	U	U	U	U	U	U	U
Toluene	mg/kg	**1400**	34	**1100**	**3100**	**2600**	**160**	**3400**
Dimethyloctane (TIC)	mg/kg	U	U	U	U	U	U	U
Ethylmethylcyclohexane (TIC)	mg/kg	U	U	U	U	U	U	U

Numbers in **BOLD** exceed the USEPA Regional Screening Levels (11/10) and/or values in the MDEQ Tier 1 TRG Table (2/28/02)
J= the identification of the analyte is acceptable; the reported value is an estimate
NJ = Presumptive evidence that analyte is present; reported as a tentative identification (TIC) with an estimated value.
O = other qualifiers have been assigned providing additional information and are defined in the analytical data sheets included as Appendix B of this report
U= the analyte was not detected at or above the reporting limit

TABLE 3
Volatile Organic Compounds – TCLP Results
Hercules Inc., Hattiesburg, Mississippi

	Station ID	HERC01	HERC02	HERC03	HERC04	HERC05	HERC06
	Sample ID	HERC01-A	HERC02-B	HERC03-B	HERC04-B	HERC05-A	HERC06-B
	Media Code	WA	WA	WA	WA	WA	WA
	Sample Date	9/28/10	9/28/10	9/28/10	9/28/10	9/28/10	9/28/10
Analyte	**Units**						
Benzene	mg/L	0.21	**0.62 J,O**	NA-5	0.22	0.23	NA-5

	Station ID	HERC07	HERC08	HERC09	HERC10	HERC11	HERC12	HERC13
	Sample ID	HERC07-B	HERC08	HERC09-B	HERC10-B	HERC11-B	HERC12-B	HERC13-B
	Media Code	WA	WA	WA	WA	WA	WA	WA
	Sample Date	9/28/10	9/29/10	9/29/10	9/29/10	9/29/10	9/29/10	9/29/10
Analyte	**Units**							
Benzene	mg/L	NA-5	NA-5	**1.8**	**2.2**	**0.54 J,O**	**1.8**	**3.6**

Numbers in **BOLD** exceed the EPA Regulatory Level of 0.5 mg/L for benzene.

TABLE 4
EPA and MDEQ Regulatory Levels for Volatile Organic Compounds
Hercules Inc., Hattiesburg, Mississippi

		MDEQ Tier 1 TRG Soil	MDEQ Tier 1 TRG Soil	EPA RSLs Soil
Analyte	**Units**	**Restricted - mg/kg**	**Unrestricted - mg/kg**	**Residential – mg/kg**
(m- and/or p-)Xylene	mg/kg	m = 418; p = 461	m = 418; p = 461	3400
1,2,4-Trimethylbenzene	mg/kg	102000	3910	62
1,2-Dichlorobenzene	mg/kg	279	279	1900
Benzene	mg/kg	1.36	0.887	1.1
Carbon disulfide	mg/kg	7.97	7.97	820
Cyclohexane	mg/kg	NS	NS	7000
Ethyl Benzene	mg/kg	395	395	5.4
Isopropylbenzene (AKA cumene)	mg/kg	9.43	9.43	2100
Methyl Acetate	mg/kg	2040000	78200	78000
Methyl Isobutyl Ketone	mg/kg	163000	6260	5300
Methylcyclohexane	mg/kg	NS	NS	NS
n- Butylbenzene	mg/kg	81800	3130	NS
o-Xylene	mg/kg	413	413	3800
p-Isopropyltoluene	mg/kg	NS	NS	NS
tert-Butylbenzene	mg/kg	81800	3130	NS
Toluene	mg/kg	38	38	5000
Dimethyloctane (TIC)	mg/kg	NS	NS	NS
Ethylmethylcyclohexane (TIC)	mg/kg	NS	NS	NS

Regulatory levels are taken from the USEPA Regional Screening Levels (11/10) and the MDEQ Tier 1 TRG Table (2/28/02)
NS = No Regulatory Standard/Level

TABLE 5
Detected Semi Volatile Organic Compounds
Hercules Inc., Hattiesburg, Mississippi

Station ID		HERC01	HERC02	HERC03	HERC04	HERC05	HERC06	HERC07
Sample ID		HERC01-A	HERC02-B	HERC03-B	HERC04-B	HERC05-A	HERC06-B	HERC07-B
Media Code		WA	WA	WA	WA	WA	WA	WA
Sample Date		9/28/10	9/28/10	9/28/10	9/28/10	9/28/10	9/28/10	9/28/10
Analyte	**Units**							
(3-and/or 4-)Methylphenol	mg/kg	20 J,O	50	U	53	100	U	78
1,1-Biphenyl	mg/kg	1600	3900	130	1800	1200	120	330
2,4-Dimethylphenol	mg/kg	U	U	U	6.0 J,O	U	U	U
2-Methylnaphthalene	mg/kg	4.6	5.6	U	8.4	14	U	U
2-Methylphenol	mg/kg	7.8 J,O	4.7 J,O	U	4.3 J,O	4.9 J,O	U	17 J,O
Acenaphthene	mg/kg	U	2.9	U	3.8	2.8	U	U
Dibenzofuran	mg/kg	U	4.1	U	3.0	U	U	U
Fluoranthene	mg/kg	11 J,O	9.8	U	U	11	U	U
Fluorene	mg/kg	3.0	3.4	U	2.7	U	U	U
Naphthalene	mg/kg	6.2	8.8	U	7.8	8.7	U	U
Phenanthrene	mg/kg	U	5.5 J,O	U	3.0 J,N	U	U	U
Phenol	mg/kg	5.3 J,O	5.4 J,O	8.9 J,O	71	31	U	U
Pyrene	mg/kg	16	U	U	3.6	5.7	U	U
(Dimethylethyl)ethoxybenzene (TIC)	mg/kg	100 NJ	300 JN	U	U	U	U	U
(Dimethylethyl)methylphenol (TIC)	mg/kg	U	U	U	U	U	U	U
(Menthenol)terpineol (TIC)	mg/kg	90 NJ	60 NJ	U	300 NJ	300 NJ	U	U
(Methylpropyl)benzene (TIC)	mg/kg	U	U	U	U	U	U	U
Bis(methylethyl)biphenyl (TIC)	mg/kg	U	U	U	U	U	U	U
Camphene (TIC)	mg/kg	200 NJ	200 NJ	U	300 NJ	200 NJ	U	U
Camphor (TIC)	mg/kg	U	U	U	200 NJ	U	U	U
Chlorotrimethylbicycloheptane (TIC)	mg/kg	U	U	U	100 NJ	100 NJ	U	U
Cycloisolongifolene (TIC)	mg/kg	80 NJ	80 NJ	U	U	200 NJ	U	U
Decahydrotrimethylmethylenemethanoazulene (TIC)	mg/kg	U	U	U	U	400 NJ	U	U
Dimethylisopropylphenanthrene (TIC)	mg/kg	U	U	200 NJ	200 NJ	100 NJ	200 NJ	200 NJ
Diphenyl ether (TIC)	mg/kg	1000 NJ	U	800 NJ	U	U	200 NJ	600 NJ
Ethyl(methylethyl)benzene (TIC)	mg/kg	60 NJ	70 NJ	U	U	U	U	U

TABLE 5 (con't)
Detected Semi Volatile Organic Compounds
Hercules Inc., Hattiesburg, Mississippi

	Station ID	HERC01	HERC02	HERC03	HERC04	HERC05	HERC06	HERC07
	Sample ID	HERC01-A	HERC02-B	HERC03-B	HERC04-B	HERC05-A	HERC06-B	HERC07-B
	Media Code	WA	WA	WA	WA	WA	WA	WA
	Sample Date	9/28/10	9/28/10	9/28/10	9/28/10	9/28/10	9/28/10	9/28/10
Analyte	**Units**							
Hexahydrodimethyl(methylethyl)naphthalene (TIC)	mg/kg	U	U	U	U	400 NJ	U	U
Hexahydrotetramethylmethanonaphthalene (TIC)	mg/kg	1000 NJ	U	600 NJ	1000 NJ	U	2000 NJ	1000 NJ
Limonene (TIC)	mg/kg	300 NJ	U	U	U	U	U	U
Methyl(methylethyl)benzene (TIC)	mg/kg	2000 NJ	3000 NJ	300 NJ	U	U	U	U
Methyl(methylethyl)cyclohexane (TIC)	mg/kg	800 NJ	600 NJ	2000 NJ	U	U	U	U
Methyl(methylethyl)cyclohexene (TIC)	mg/kg	U	U	U	U	U	U	U
Methyl(methylethyl)phenanthrene (TIC)	mg/kg	U	U	200 NJ	U	U	U	U
Petroleum Product	mg/kg	N	N	U	N	N	N	N
Phenanthrenecarboxylic acid (TIC)	mg/kg	U	U	U	U	200 NJ	U	U
Pinene (TIC)	mg/kg	500 NJ	200 NJ	U	700 NJ	900 NJ	U	U
Propylphenol (TIC)	mg/kg	U	50 NJ	U	200 NJ		U	U
Trimethylbicycloheptane (TIC)	mg/kg	U	U	300 NJ	300 NJ	400 NJ	U	U
Unidentified Compound(s)	mg/kg	70 J	900 J	3000 J	2000 J	700 J	6000 J	5000J

Numbers in **BOLD** exceed one or both of the USEPA Regional Screening Levels (11/10) or the MDEQ Tier 1 TRG Table (2/28/02)
J= the identification of the analyte is acceptable; the reported value is an estimate
NJ = Presumptive evidence that analyte is present; reported as a tentative identification (TIC) with an estimated value.
O = other qualifiers have been assigned providing additional information and are defined in the analytical data sheets included as Appendix B of this report
U= the analyte was not detected at or above the reporting limit
TIC = Tentatively Identified Compound

TABLE 5 (con't)
Detected Semi Volatile Organic Compounds
Hercules Inc., Hattiesburg, Mississippi

Station ID		HERC08	HERC09	HERC10	HERC11	HERC12	HERC13
Sample ID		HERC08	HERC09-B	HERC10-B	HERC11-B	HERC12-B	HERC13-B
Media Code		WA	WA	WA	WA	WA	WA
Sample Date		9/29/10	9/29/10	9/29/10	9/29/10	9/29/10	9/29/10
Analyte	**Units**						
(3-and/or 4-)Methylphenol	mg/kg	U	U	U	13 J,O	3.1 J,O	18 J,O
1,1-Biphenyl	mg/kg	U	290	1600	480	500	1500
2,4-Dimethylphenol	mg/kg	U	U	U	U	U	U
2-Methylnaphthalene	mg/kg	U	2.6	4.6	2.6	3.5	4.1
2-Methylphenol	mg/kg	U	U	U	3.8 J,O	U	4.0 J,O
Acenaphthene	mg/kg	U	U	U	U	U	U
Dibenzofuran	mg/kg	U	U	U	U	U	U
Fluoranthene	mg/kg	U	6.8	U	10	9.5	7.0
Fluorene	mg/kg	U	U	U	U	U	U
Naphthalene	mg/kg	U	3.1	6.7	3.3	3.9	5.2
Phenanthrene	mg/kg	U	3.1 J,O	U	5.0 J,O	U	U
Phenol	mg/kg	U	7.2 J,O	18 J,O	6.2 J,O	15 J,O	28
Pyrene	mg/kg	U	3.5	3.4	4.8	U	3.1
(Dimethylethyl)ethoxybenzene (TIC)	mg/kg	U	U	U	U	U	U
(Dimethylethyl)methylphenol (TIC)	mg/kg	U	100 NJ	U	200 NJ	U	U
(Menthenol)terpineol (TIC)	mg/kg	U	U	200 NJ	U	U	400 NJ
(Methylpropyl)benzene (TIC)	mg/kg	U	U	90 NJ	U	U	U
Bis(methylethyl)biphenyl (TIC)	mg/kg	70 NJ	U	U	U	U	U
Camphene (TIC)	mg/kg	U	100 NJ	1000 NJ	100 NJ	200 NJ	1000 NJ
Camphor (TIC)	mg/kg	U	U	U	U	U	U
Chlorotrimethylbicycloheptane (TIC)	mg/kg	U	U	U	U	U	U
Cycloisolongifolene (TIC)	mg/kg	U	U	U	U	U	U
Decahydrotrimethylmethylenemethanoazulene (TIC)	mg/kg	U	300 NJ	U	U	U	U
Dimethylisopropylphenanthrene (TIC)	mg/kg	400 NJ	400 NJ	U	200 NJ	300 NJ	200 NJ
Diphenyl ether (TIC)	mg/kg	U	1000 NJ	200 NJ	U	2000 NJ	5000 NJ
Ethyl(methylethyl)benzene (TIC)	mg/kg	U	U	U	U	U	U

TABLE 5 (con't)
Detected Semi Volatile Organic Compounds
Hercules Inc., Hattiesburg, Mississippi

	Station ID	HERC08	HERC09	HERC10	HERC11	HERC12	HERC13
	Sample ID	HERC08	HERC09-B	HERC10-B	HERC11-B	HERC12-B	HERC13-B
	Media Code	WA	WA	WA	WA	WA	WA
	Sample Date	9/29/10	9/29/10	9/29/10	9/29/10	9/29/10	9/29/10
Analyte	**Units**						
Hexahydrodimethyl(methylethyl)naphthalene (TIC)	mg/kg	U	U	U	U	U	U
Hexahydrotetramethylmethanonaphthalene (TIC)	mg/kg	200 NJ	2000 NJ	U	1000 NJ	500 NJ	1000 NJ
Limonene (TIC)	mg/kg	U	U	U	U	U	U
Menthene (TIC)	mg/kg	U	600 NJ	U	100 NJ	U	U
Methyl(methylethyl)benzene (TIC)	mg/kg	U	700 NJ	7000 NJ	700 NJ	3000 NJ	7000 NJ
Methyl(methylethyl)cyclohexane (TIC)	mg/kg	U	1000 NJ	4000 NJ	2000 NJ	2000 NJ	4000 NJ
Methyl(methylethyl)cyclohexene (TIC)	mg/kg	U	100 NJ	U	U	80 NJ	200 NJ
Methyl(methylethyl)phenanthrene (TIC)	mg/kg	U	U	U	U	U	U
Petroleum Product	mg/kg	N	N	N	N	N	U
Phenanthrenecarboxylic acid (TIC)	mg/kg	U	U	U	U	U	U
Pinene (TIC)	mg/kg	U	U	2000 NJ	100 NJ	U	2000 NJ
Propylphenol (TIC)	mg/kg	U	U	200 NJ	U	300 NJ	200 NJ
Trimethylbicycloheptane (TIC)	mg/kg	U	100 NJ	200 NJ	200 NJ	200 NJ	200 NJ
Unidentified Compound(s)	mg/kg	2000 J	1000 J	2000 J	2000 J	1000 J	2000 NJ

Numbers in **BOLD** exceed one or both of the USEPA Regional Screening Levels (11/10) or the MDEQ Tier 1 TRG Table (2/28/02)
J= the identification of the analyte is acceptable; the reported value is an estimate
NJ = Presumptive evidence that analyte is present; reported as a tentative identification (TIC) with an estimated value.
O = other qualifiers have been assigned providing additional information and are defined in the analytical data sheets included as Appendix B of this report
U= the analyte was not detected at or above the reporting limit
TIC = Tentatively Identified Compound

TABLE 6
EPA and MDEQ Regulatory Levels for Semi Volatile Organic Compounds
Hercules Inc., Hattiesburg, Mississippi

		MDEQ Tier 1 TRG Soil	MDEQ Tier 1 TRG Soil	EPA RSLs Soil
Analyte	**Units**	**Restricted - mg/kg**	**Unrestricted - mg/kg**	**Residential – mg/kg**
(3-and/or 4-)Methylphenol	mg/kg	102000/10200	3910/391	7500
1,1-Biphenyl	mg/kg	10200	3910	3900
2,4-Dimethylphenol	mg/kg	40800	1560	1200
2-Methylnaphthalene	mg/kg	40900	1560	310
2-Methylphenol	mg/kg	102000	3910	3100
Acenaphthene	mg/kg	123000	4690	3400
Dibenzofuran	mg/kg	8180	313	78
Fluoranthene	mg/kg	81700	3130	2300
Fluorene	mg/kg	81700	3130	2300
Naphthalene	mg/kg	247	194	3.6
Phenanthrene	mg/kg	61300	2350	NS
Phenol	mg/kg	123000	46900	18000
Pyrene	mg/kg	61300	2350	1700
(Dimethylethyl)ethoxybenzene (TIC)	mg/kg	NS	NS	NS
(Dimethylethyl)methylphenol (TIC)	mg/kg	NS	NS	NS
(Menthenol)terpineol (TIC)	mg/kg	NS	NS	NS
(Methylpropyl)benzene (TIC)	mg/kg	NS	NS	NS
Bis(methylethyl)biphenyl (TIC)	mg/kg	NS	NS	NS
Camphene (TIC)	mg/kg	NS	NS	NS
Camphor (TIC)	mg/kg	NS	NS	NS
Chlorotrimethylbicycloheptane (TIC)	mg/kg	NS	NS	NS
Cycloisolongifolene (TIC)	mg/kg	NS	NS	NS
Decahydrotrimethylmethylenemethanoazulene (TIC)	mg/kg	NS	NS	NS
Dimethylisopropylphenanthrene (TIC)	mg/kg	NS	NS	NS
Diphenyl ether (TIC)	mg/kg	NS	NS	NS
Ethyl(methylethyl)benzene (TIC)	mg/kg	NS	NS	NS
Hexahydrodimethyl(methylethyl)naphthalene (TIC)	mg/kg	NS	NS	NS

NS = No Regulatory Standard/Level
TIC = Tentatively Identified Compound

TABLE 6 (con't)
EPA and MDEQ Regulatory Levels for Semi Volatile Organic Compounds
Hercules Inc., Hattiesburg, Mississippi

Analyte	Units	MDEQ Tier 1 TRG Soil	MDEQ Tier 1 TRG Soil	EPA RSLs Soil
Hexahydrotetramethylmethanonaphthalene (TIC)	mg/kg	NS	NS	NS
Limonene (TIC)	mg/kg	NS	NS	NS
Menthene (TIC)	mg/kg	NS	NS	NS
Methyl(methylethyl)benzene (TIC)	mg/kg	NS	NS	NS
Methyl(methylethyl)cyclohexane (TIC)	mg/kg	NS	NS	NS
Methyl(methylethyl)cyclohexene (TIC)	mg/kg	NS	NS	NS
Methyl(methylethyl)phenanthrene (TIC)	mg/kg	NS	NS	NS
Petroleum Product	mg/kg	NS	NS	NS
Phenanthrenecarboxylic acid (TIC)	mg/kg	NS	NS	NS
Pinene (TIC)	mg/kg	NS	NS	NS
Propylphenol (TIC)	mg/kg	NS	NS	NS
Trimethylbicycloheptane (TIC)	mg/kg	NS	NS	NS
Unidentified Compound(s)	mg/kg	NS	NS	NS

NS = No Regulatory Standard/Level
TIC = Tentatively Identified Compound

TABLE 7 - Metals Data
Hercules Inc., Hattiesburg, Mississippi

Station ID		HERC01	HERC02	HERC03	HERC04	HERC05	HERC06	HERC07
Sample ID		HERC01-A	HERC02-B	HERC03-B	HERC04-B	HERC05-A	HERC06-B	HERC07-B
Media Code		WA	WA	WA	WA	WA	WA	WA
Sample Date		9/28/10	9/28/10	9/28/10	9/28/10	9/28/10	9/28/10	9/28/10
Analyte	**Units**							
Aluminum	mg/kg	6600	4900	5700	5200	5100	5800	6700
Antimony	mg/kg	U	U	U	U	U	U	U
Arsenic	mg/kg	U	U	U	**6.4**	**5.6**	U	U
Barium	mg/kg	18	18	21	27	35	100 J,O	23
Beryllium	mg/kg	U	U	U	U	U	U	U
Cadmium	mg/kg	U	U	U	0.46	0.49	U	0.48
Calcium	mg/kg	75 J,O	58	210	400	2000	5000	710
Chromium	mg/kg	**24**	**11**	**7.7**	**29**	**45**	**20 J,O**	**32**
Cobalt	mg/kg	7.9	14	2.9	14	17	7.2	9.5
Copper	mg/kg	69 J,O	44	29	100	84	27 J,O	26
Iron	mg/kg	1200 J,O	1600	4300	3400	4600	4000 J,O	5200
Lead	mg/kg	23	60	9.1	26	34	22	23
Magnesium	mg/kg	65	45	230	76	170	440 J,O	62
Manganese	mg/kg	4.6	3.8	31	14	32	200 J,O	37
Molybdenum	mg/kg	8.0	3.1	U	4.0	4.8	21 J,O	40
Nickel	mg/kg	71 J,O	120	80	200	210	54 J,O	44
Potassium	mg/kg	U	U	180	96	110	160	U
Selenium	mg/kg	U	U	U	U	U	U	U
Silver	mg/kg	U	U	U	U	U	U	U
Sodium	mg/kg	170 J,O	150 J,O	U	130 J,O	460 J,O	180 J,O	130 J,O
Strontium	mg/kg	2.1	1.6	2.1	6.1	8.9	34 J,O	8.9
Thallium	mg/kg	U	U	U	U	U	U	U
Titanium	mg/kg	32	17	62	42	51	56 J,O	22
Vanadium	mg/kg	4.3	2.1	**8.7**	**5.6**	**6.6**	3.9	2.8
Yttrium	mg/kg	0.58	0.57	1.2	0.99	1.1	1.9	1.7
Zinc	mg/kg	270 J,O	120	68	510	690	500 J,O	650

Numbers in **BOLD** exceed one or both of the USEPA Regional Screening Levels (11/10) or the MDEQ Tier 1 TRG Table (2/28/02)
J= the identification of the analyte is acceptable; the reported value is an estimate
O = other qualifiers have been assigned providing additional information and are defined in the analytical data sheets included as Appendix B
U= the analyte was not detected at or above the reporting limit

TABLE 7 - Metals Data (con't)
Hercules Inc., Hattiesburg, Mississippi

	Station ID	HERC08	HERC09	HERC10	HERC11	HERC12	HERC13
	Sample ID	HERC08	HERC09-B	HERC10-B	HERC11-B	HERC12-B	HERC13-B
	Media Code	WA	WA	WA	WA	WA	WA
	Sample Date	9/29/10	9/29/10	9/29/10	9/29/10	9/29/10	9/29/10
Analyte	**Units**						
Aluminum	mg/kg	7900	7100	6400	7000	6700	6800
Antimony	mg/kg	U	U	U	U	U	U
Arsenic	mg/kg	U	U	**5.0**	U	U	**5.6**
Barium	mg/kg	61	23	33	23	30	45
Beryllium	mg/kg	U	U	U	U	U	U
Cadmium	mg/kg	U	U	U	U	U	U
Calcium	mg/kg	250	530	2800	350	1200	1700
Chromium	mg/kg	**20**	**20**	**26**	**25**	**18**	**36**
Cobalt	mg/kg	2.7	10	14	10	13	21
Copper	mg/kg	17	110	210	93	110	210
Iron	mg/kg	8300	3500	3200	1900	4700	3100
Lead	mg/kg	24	25	23	23	18	36
Magnesium	mg/kg	240	160	200	170	210	150
Manganese	mg/kg	350	39	36	14	36	15
Molybdenum	mg/kg	37	13	6.4	4.0	2.8	5.6
Nickel	mg/kg	8.2	150	340	140	270	490
Potassium	mg/kg	210	160	220	160	170	190
Selenium	mg/kg	U	U	U	U	U	U
Silver	mg/kg	U	1.0	U	U	U	U
Sodium	mg/kg	U	150 J,O	210 J,O	180 J,O	240 J,O	230 J,O
Strontium	mg/kg	2.6	4.6	7.3	4.2	8.5	8.9
Thallium	mg/kg	U	U	U	U	U	U
Titanium	mg/kg	98	46	61	52	54	76
Vanadium	mg/kg	**18**	**5.9**	**7.6**	**7.2**	**7.5**	**9.0**
Yttrium	mg/kg	2.7	2.0	1.2	1.2	1.6	1.2
Zinc	mg/kg	130	220	570	270	370	480

Numbers in **BOLD** exceed one or both of the USEPA Regional Screening Levels (11/10) or the MDEQ Tier 1 TRG Table (2/28/02)
J= the identification of the analyte is acceptable; the reported value is an estimate
O = other qualifiers have been assigned providing additional information and are defined in the analytical data sheets included as Appendix B
U= the analyte was not detected at or above the reporting limit

TABLE 8 - EPA and MDEQ Regulatory Levels for Metals
Hercules Inc., Hattiesburg, Mississippi

		MDEQ- Soil	MDEQ- Soil	EPA RSLs - Soil
Analyte	**Units**	**Restricted - mg/kg**	**Unrestricted - mg/kg**	**Residential – mg/kg**
Aluminum	mg/kg	2040000	78200	77000
Antimony	mg/kg	81.7	31.3	31 (metallic)
Arsenic	mg/kg	3.82	0.426	0.39 (inorganic)
Barium	mg/kg	14300	5480	15000
Beryllium	mg/kg	1020	156	160 (& compounds)
Cadmium	mg/kg	1020	39.1	70 (diet)
Calcium	mg/kg	NS	NS	NS
Chromium III	mg/kg	3070000	117000	120000
Chromium VI	mg/kg	381	227	0.29
Cobalt	mg/kg	12300	4690	23
Copper	mg/kg	8170	3130	3100
Iron	mg/kg	613000	23500	55000
Lead	mg/kg	1700	400	400 (& compounds)
Magnesium	mg/kg	NS	NS	NS
Manganese	mg/kg	4080	1560	1800 (non-diet)
Molybdenum	mg/kg	1020	391	390
Nickel	mg/kg	4080	1560	1500 (soluble salts)
Potassium	mg/kg	NS	NS	NS
Selenium	mg/kg	1020	391	390
Silver	mg/kg	1020	391	390
Sodium	mg/kg	NS	NS	NS
Strontium (stable)	mg/kg	123000	46900	47000
Thallium	mg/kg	143	5.48	NS
Titanium	mg/kg	8180000	313000	NS
Vanadium	mg/kg	1430	548	5.5 (metallic)
Yttrium	mg/kg	NS	NS	NS
Zinc	mg/kg	61300	23500	23000 (metallic)

Regulatory levels are taken from the USEPA Regional Screening Levels (11/10) or the MDEQ Tier 1 TRG Table (2/28/02)
NS = No Regulatory Standard/Level

APPENDIX A

PHOTOGRAPHS OF SAMPLING ACTIVITIES

Hercules Inc., Hattiesburg, Mississippi
SESD Project Identification Number: 10-0629

Photograph 1
Example of waste/sludge from the "Back 40"

Photograph 2
Assessing the HERC03-B sample location

Photograph 3
Example of waste/ sludge from the "Back 40"

Photograph 4
Example of waste/ sludge from the "Back 40"

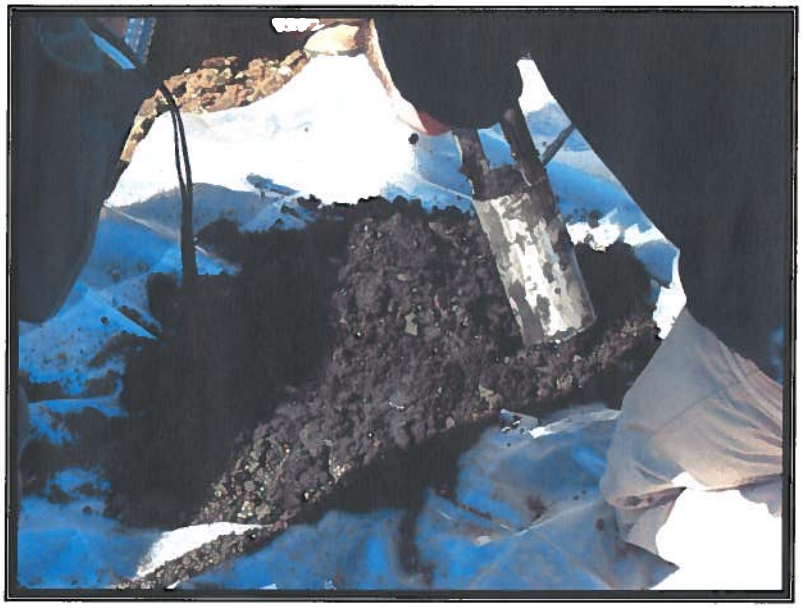
Photograph 5
Collecting sample HERC03-B

Photograph 6
Air monitoring during HERC03-B sample collection

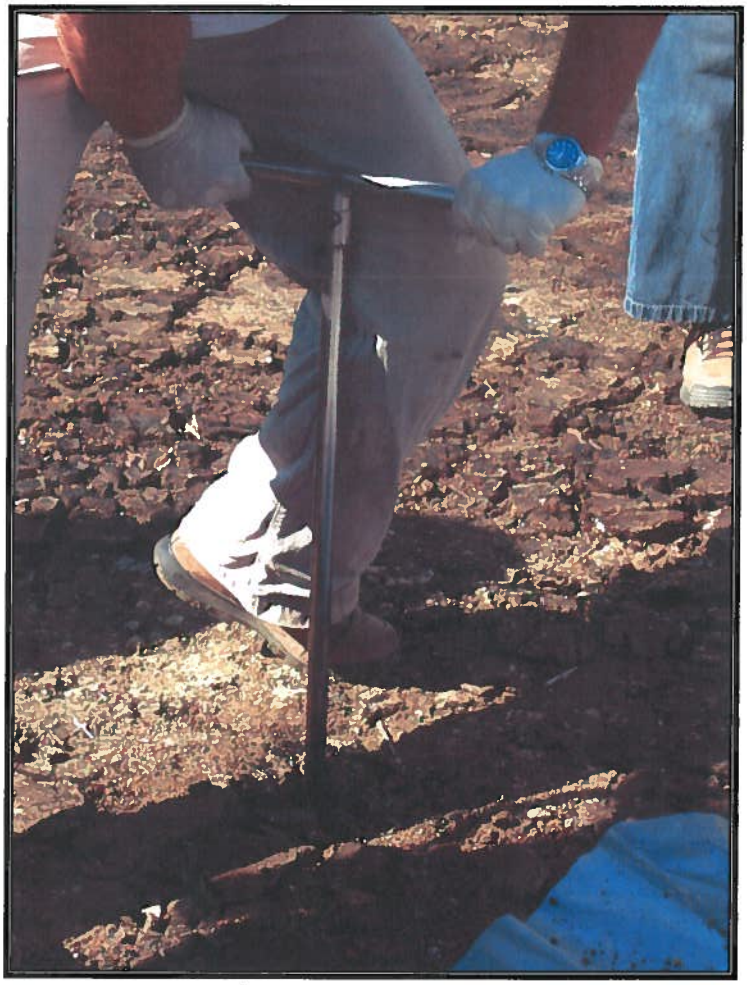
Photograph 7
Sample location HERC05-A

Photograph 8
Sample location HERC04-B

Photograph 9
Sample HERC06-B



Photograph 10
Sample HERC07-B



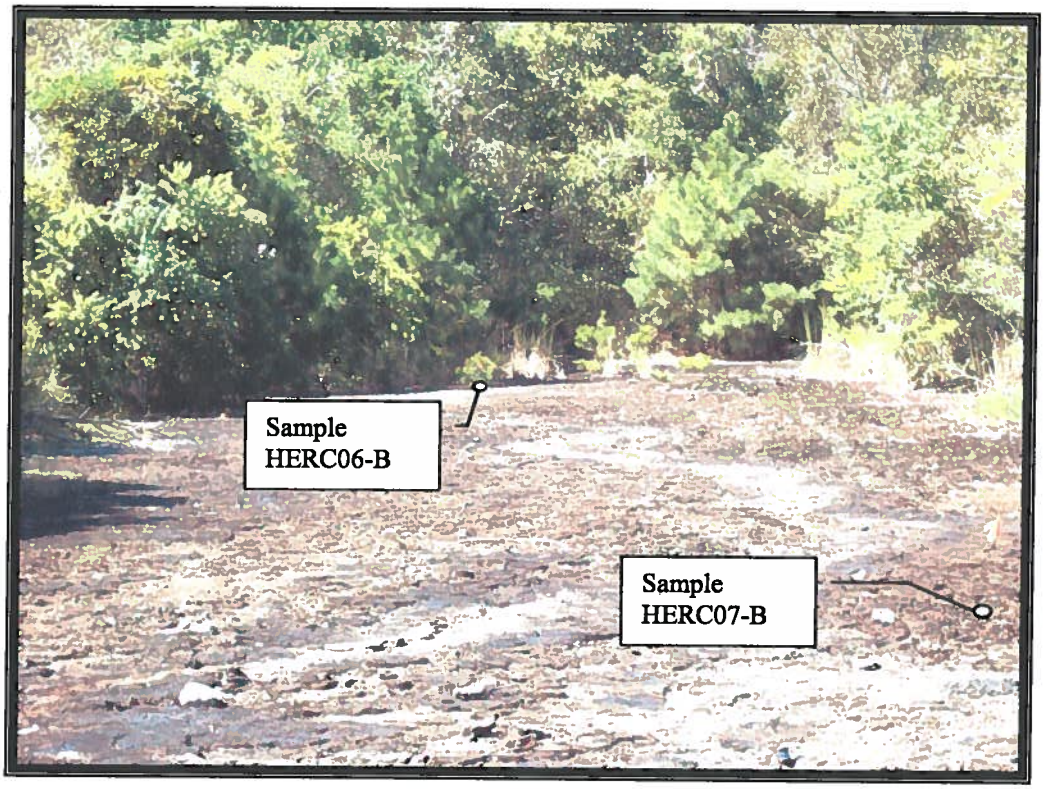
Photograph 11
Hand augering sample HERC07-B

Photograph 12
Sampling "wetlands" to collect HERC08

Photograph 13
Sample HERC08 – note dense root system

Photograph 14
Sample HERC08 – note dense root system

Photograph 15
Attempting to collect another sample from the "wetlands" - dense root system prevented sample collection



Photograph 16
Locations for samples HERC06-B and HERC07-B

Photograph 17 – General area of sample HERC05-A

Photograph 18
General area of sample HERC04-B

Photograph 19
Coring HERC09-B using Geoprobe

Photograph 20
Collecting sample HERC09-B with hand auger

Photograph 21
Collecting sample HERC11-B

Photograph 22
Collecting sample HERC11-B

Photograph 23
Collecting sample HERC12-B

APPENDIX B

SESD ANALYTICAL DATA SHEETS

Hercules Inc., Hattiesburg, Mississippi
SESD Project Identification Number: 10-0629

Semi-Volatile Organic Compounds = 59 pages – issued 11/1/10

Volatile Organic Compounds = 60 pages – issued 11/8/10

Metals = 34 pages – issued 1/4/11