



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4**

Science and Ecosystem Support Division
Enforcement and Investigations Branch
980 College Station Road
Athens, Georgia 30605-2720

January 19, 2012

4SESD-EIB

MEMORANDUM

SUBJECT: U.S. Finishing/Cone Mills RI/FS
Quality Assurance Project Plan
Greeneville, South Carolina
SESD Project Number 12-0140

FROM: Timothy Simpson, Environmental Scientist
Superfund and Air Section

THRU: Laura Ackerman, Chief
Superfund and Air Section

TO: Scott Martin, RPM
Superfund Remedial Branch, Section C
Superfund Division

A handwritten signature in blue ink, reading "Timothy Simpson", is written over the "FROM:" line.

A handwritten signature in blue ink, reading "Laura Ackerman", is written over the "THRU:" line.

Attached is the Quality Assurance Project Plan (QAPP) for the soil sampling Remedial Investigation to be conducted at the US Finishing/Cone Mills Site in Greenville, South Carolina. The QAPP covers the soil samples to be collected by SESD from the Permitted Sludge Landfill. The sampling event is scheduled for the week of January 23, 2011.

If you have any questions, please call me at (706) 355-8736.

Attachment

cc: Arnold Ostrofsky (J.M. Waller)



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U.S. Environmental Protection Agency
 Science and Ecosystem Support Division
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 Athens, GA 30605

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SECTION A: Project Planning Elements

A1. Title (Project Name):	U.S. Finishing/Cone Mills	
Project Location:	Greenville, Greenville County, South Carolina	
Project Requestor and Organization:	Scott Martin, Superfund Division, Superfund Remedial Branch, Section C 61 Forsyth Street, SW, Atlanta, Georgia 30303	
Project Leader's Name, Position, and Organization:	Tim Simpson, Environmental Scientist SESD, Superfund & Air Section	
Project Leader's Signature:	<i>Timothy Simpson</i>	Date: 01/19/12
Technical Reviewer's Name and Position:	<i>Douglas Jager, Environmental Scientist SESD, Superfund & Air Section</i>	
Technical Reviewer's Signature:	<i>K. Jager</i>	Date: 01/19/12
Section Chief's Name and Position:	Laura Ackerman, Chief, Superfund & Air Section	
Section Chief's Signature:	<i>L. Ackerman</i>	Date: 1/19/12
A2. Table of Contents	N/A	
A3. Distribution List	Scott Martin, Arnold Ostrofsky (J.M. Waller)	
A4. Project Personnel	Organization	Responsibilities
Tim Simpson	EPA/SESD/Superfund & Air Section	Project Leader, Sampler
Landon Pruitt	EPA/SESD/Superfund & Air Section	Sampler, Safety Officer
Jairo Castillo	EPA/SESD/Superfund & Air Section	Sampler
Marty Allen	EPA/SESD/Enforcement Section	Geoprobe Operator, Sampler
Jerry Ackerman	EPA/SESD/Aquatic Biology Section	Surface Water/Sediment Sampling
Jon McMahan	EPA/SESD/Aquatic Biology Section	Surface Water/Sediment Sampling



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Phyllis Meyer	EPA/SESD/Water Quality Section	Surface Water/Sediment Sampling
Brian Herndon	ILS	Sampling Processing/Scribe
Ian Adams	ILS	XRF Screening
Andrew Grimmke	J.M .Waller Associates Inc.	Soil Classification

Comments: Project personnel subject to change.

**A5. Problem Definition –
 Investigation Objectives
 and Background
 Information:**

The U.S. Finishing/Cone Mills Site is located at 3335 Old Buncombe Road in Greenville, South Carolina (see Figure 1). The site is approximately 3 miles north of downtown Greenville. The facility was constructed in 1903 and operated as a textile bleaching and finishing facility. The plant was expanded on several occasions. In 1957, the plant was sold to Cone Mills, which operated the plant until 1984. American Fast Print, Ltd. (AFP) purchased the facility in May 1984 and operated under the name US Finishing until November 2003 when the main plant was partially destroyed by fire. AFP is the current property owner of a large portion of the facility. The Site was proposed for the National Priorities List (NPL) on March 11, 2011 and finalized in September 2011.

The main portion of the property is comprised of three main buildings: the approximately 400,000 square feet industrial building that includes a basement and two floors partially destroyed by the 2003 fire, a warehouse, and the former groundwater remediation plant. The site also includes two reservoirs, the Northern Reservoir (dry) and the Northwest Reservoir, and an aeration lagoon. Removal operation activities involving the damaged building began in October 2011.

The 259-acre property is bordered by Langston Creek to the east and the Reedy River to the west. Langston Creek combines with the Reedy River south of the site. Residential properties are located north and west of the site. Additional residential properties are located north of the Northern Reservoir.

Until the late 1960s, the Reedy River floodplain dump was used as an open dump for solid waste disposal. Wastes deposited in the Reedy River floodplain dump included coal ash from the boiler operations, dye sludge, construction debris, asbestos tiles, general waste from the offices and production floor waste. Local residents also used this area as a waste dump for general household trash.



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A6. Project Description:	<p>SESD will collect multimedia environmental samples, as part of a Remedial Investigation, to delineate the extent of contamination in surface and subsurface soils, surface water, groundwater, and sediment on and off-site. The EPA contractor, J.M. Waller Associates Inc. (JMWA), was tasked to develop the overall site Sampling and Analysis Plan (SAP). The SAP consists of two volumes, Volume 1: Field Sampling Plan and Volume 2: Quality Assurance Project Plan.</p> <p>The following is a list of Areas of Concern (AOCs) identified in the SAP for the completion of the RI/FS.</p> <ul style="list-style-type: none"> • Permitted Sludge Landfill – AOC 1 • Aeration Lagoon – AOC 2 • Reedy River Floodplain – AOC 3 • Basement Sludges – AOC 4 • Chromium Tank and Distribution Lines – AOC 5 • Fuel Tank, Line, and W-8 – AOC 6 • Caustic Plume – AOC 7 • Blue Pond – AOC 8 • Langston Creek Floodplain – AOC 9 • Surface Soils between the Main Plant and Langston Creek – AOC 10 • Alston Street Fuel Oil Storage Tank – AOC 11 • Water Treatment Plant – AOC 12 • Reedy River – AOC 13 • Northern Reservoir – AOC 14 • Northwestern Reservoir – AOC 15 • Main Plant – AOC 16 <p>SESD is the lead for sampling in several AOCs, including AOC 1 and AOC 14. Samples collected from other AOCs will be addressed in the overall site SAP written by JMWA. SESD field sampling activities began the week of November 28, 2011 when surface and subsurface soil samples were collected from AOC 14.</p> <p>This QAPP specifically covers subsurface soil samples to be collected from the Permitted Sludge Landfill (AOC 1). The purpose of this sampling investigation is to characterize potential sludge material in AOC 1. Proposed sample station locations are summarized in Table 1 and appear in Figure 2. GPS data will be collected at each station using a Trimble GeoExplorer. The fifteen proposed sample stations will be pre-marked by JMWA prior to the sampling event.</p>
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In general, sample collection in AOC 1 will be limited to potential sludge material identified in the soil cores. Soil cores will be collected by SESD using a track-mounted Geoprobe® Direct Push Technology (DPT) rig with a 4-foot long Macro-Core® sampling device. Soil cores will be collected to a total depth of approximately 16 ft. Based on historical information, the approximate depth to the sludge material was between 6 and 11 feet.

At three locations, designated on Figure 2 with a blue dot, the total borehole depth will be extended to the groundwater table in order to determine the depth to water and the hydraulic gradient across AOC 1. Based on historical information, the depth to water is approximately 18 feet below ground surface (ft bgs).

At each sample station, soil cores will initially be screened for the presence of organic compounds using a TVA-1000. Cores with TVA screenings results above two-times the background levels will be evaluated for the collection of volatile organic compounds (VOCs). It should be noted that samples for VOC analyses will be collected using Encores® and will not be mixed.

At every station, approximately one sample will be collected from each soil core. Samples will be collected from the cores using stainless steel spoons and mixed in glass pans. The sample will be placed on ice and will be evaluated for laboratory submittal depending on the screening results. Sample collection will be based on screening results, as well as, visual observations.

Each sample collected will be screened for metals using a Niton XLt 793WY X-Ray Fluorescence (XRF). The XRF screening results will be compared to the residential soil Regional Screening Levels (RSLs) summarized in Table 2. RSLs are conservative, long-term risk-based screening values developed by EPA to help identify contaminants of potential concern. The SESD procedure for *Field X-Ray Fluorescence Measurement* states that samples that screen at concentrations of 70% - 80% of the action level value are submitted for confirmation analyses to confirm that concentrations are equal to or greater than site action levels.

For several metals, including arsenic, cadmium and mercury, the RSL is below the detection level for the XRF. When this occurs, the screening



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data will be compared to the XRF detection level and that detection level will serve as the site screening action level.

Regarding chromium, the RSL for chromium salts is 120,000 mg/kg whereas the RSL for hexavalent chromium is 0.29 mg/kg. The XRF detection level for chromium is 60 mg/kg. For this investigation, the screening action level to be used for chromium will be 60 mg/kg.

The site screening action levels to be used are as follows:

Aluminum (53,900 mg/kg)
Antimony (250 mg/kg)
Arsenic (20 mg/kg)
Cadmium (75 mg/kg)
Chromium (60 mg/kg)
Cobalt (200 mg/kg)
Copper (2170 mg/kg)
Iron (38,500 mg/kg)
Lead (280 mg/kg)
Manganese (1260 mg/kg)
Mercury (20 mg/kg)
Nickel (1050 mg/kg)
Selenium (273 mg/kg)
Silver (273 mg/kg)
Vanadium (273 mg/kg)
Zinc (16,100 mg/kg)

For this investigation, at least one soil sample will be submitted for laboratory confirmation analyses from each station where visual observations indicate likely sludge material is present, TVA screening results are elevated, or XRF screening results exceed the site screening action levels. Additionally, soil samples will be collected from approximately ten percent of the sample stations where no visible sludge was present and screening action levels were below the site screening action levels.

Samples will be analyzed by the SESD laboratory in Athens, GA. All samples will be analyzed for metals, including mercury, and semi-volatile organic compounds (SVOCs). Additional samples, collected from approximately ten percent of the stations above the site screening action levels, will be analyzed for cyanide, VOCs, pesticides, and PCBs.

At the request of the EPA, Region 4, Technical Services Section,



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	<p>hexavalent chromium (chromium VI) analysis will be conducted on approximately three samples in order to evaluate the percentage of hexavalent chromium contribution to the total chromium concentrations.</p> <p>During the investigation one JMWA geologist will log the soil cores according to the Unified Soil Classification System (USCS), complete a soil boring log, and conduct a photograph log for each boring location. The overall purpose of the soil classification by USCS will be to characterize the overburden above the waste layer, identify the waste layer(s), and determine preferential migration pathways. A ten percent subset of all samples will be submitted for grain size analysis with hydrometer. Custody of samples for grain size will be maintained by JMWA. The information will be used to determine the accuracy of the soil classification provided by the JMWA geologist.</p> <p>In addition to the subsurface soil sample collection activities in AOC 1, SESD will assist JMWA staff in the collection of surface water and sediment samples from the Reedy River (AOC 13) and Langston Creek (AOC9). The sampling activities for the Reedy River and Langston Creek will be led by JMWA staff and will be conducted in accordance to the site SAP. Sample collection will be conducted in accordance to the SESD sampling procedures for surface water and sediment sample collection. SESD will provide the sampling equipment (glass pans, stainless steel scoops and spoons). All samples collected in AOCs 9 and 13 will be processed and maintained by JMWA.</p>
Applicable regulatory information, actions levels, etc.	SESD will compare the data to Region 4 Screening Levels to determine if levels have been exceeded.
Decision(s) to be made based on data:	Determine the nature and extent of contamination. Determine if remedial actions are needed. The Superfund Division will assess the risk to human health and the environment, and evaluate alternatives to mitigate risks due to unacceptable levels of contaminants of potential concern.
Field Study Date:	Field work is scheduled to begin the week of January 23, 2012.
Projected Lab Completion Date:	Projected Date: 03/12/2012



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Final Report Completion Date:	Projected Date: 04/09/2012
A7. Quality Objectives and Criteria All samples/sample locations meet the field investigation objectives and purposes summarized in Sections A5 and A6 of this QAPP.	
A8. Special Training/Certifications N/A	
A9. Documents and Records The final report will be prepared in accordance with the requirements of the <i>SESD Operating Procedure for Report Preparation and Distribution</i> , SESDPROC-003-R3. All field observations, measurements and sampling activities supporting the field investigation will be recorded and documented according to the <i>SESD Operating Procedure for Logbooks</i> , SESDPROC-010-R4. Project files will be maintained according to the <i>SESD Operating Procedure for Control of Records</i> , SESDPROC-002-R5.	

SECTION B: Data Generation and Acquisition

B1. Sampling Design The sampling design was chosen based on the data quality objectives of the study. Proposed sampling locations appear in Figure 2.		
Media	Number of Samples	Analyses
Soil	30	Metals, including mercury and SVOCS. Additional samples for hexavalent chromium, cyanide, PCBs, pesticides, and VOCs.
B2. Sampling Methods, General Procedures SESDPROC107-R2, (Field XRF Measurement) SESDPROC110-R3 (Global Positioning System) SESDPROD300-R2 (Soil Sampling) SESDPROD200-R2 (Sediment Sampling) SESDPROD201-R1 (Surface Water Sampling)		



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B3. Sampling Handling and Custody

All samples will be handled and custody maintained according to the following:

SESD Analytical Support Branch Laboratory Operations and Quality Assurance Manual, July 2011.
SESD Operating Procedure for Sample and Evidence Management, SEDDPROC-005-R1.
SESD Operating Procedure for Packing, Labeling and Shipping of Environmental and Waste Samples SEDDPROC-209-R1.

B4. Analytical Methods

SESD:	Samples will be analyzed by the EPA/SESD laboratory in Athens, GA in accordance with the <i>SESD Analytical Support Branch Laboratory Operations and Quality Assurance Manual</i> , July 2011. Specific Analytical Methods are: Metals - EPA6010C or EPA 200.8; Mercury EPA 7473; Cyanide - SM 335.4; PCBs - EPA 8082; SVOCs - EPA 8270D; Pesticides, - EPA 8081A; VOCs - EPA 8260C.
CLP:	
Other:	

B5. Quality Control

Field:	Field quality control measures will be in accordance with the <i>SESD Operating Procedure for Field Sampling Quality Control</i> , SEDDPROC-011-R3. Split samples will be collected at a rate of 1 per 20 environmental samples during the field investigation. Trip blanks, equipment rinse blanks, temperature blanks, and preservative blanks will be collected during the investigation.
Laboratory:	Laboratory quality control measures are specified in the <i>SESD Analytical Support Branch Laboratory Operations and Quality Assurance Manual</i> , July 2011. One matrix spike/matrix spike duplicate will be collected per 20 samples collected.

B6. Instrument/Equipment Testing, Inspection and Maintenance

All field measurement instruments and equipment will be maintained in accordance with the *SESD Operating Procedure for Equipment Inventory and Management*, SEDDPROC-108-R3.

B7. Instrument/Equipment Calibration and Frequency

All field measurement instruments and equipment are calibrated according to the *SESD Operating Procedure for Equipment Inventory and Management*, SEDDPROC-108-R3 and according to specific procedures included within the defined operating procedures for each instrument (see specific field measurement procedures in Section B2 of this QAPP).



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B8. Inspection/Acceptance for Supplies and Consumables

All critical supplies and consumables for this field investigation are inspected and maintained in accordance with the following procedures:

SESD Operating Procedure for Purchasing of Services and Supplies, SESDPROC-015-R3.
SESD Operating Procedure for Equipment Inventory and Management, SESDPROC-108-R3.
SESD Operating Procedure for Field Sampling Quality Control, SESDPROC-011-R3.

The SESD Field Quality Manager and the Branch Quality Assurance Officers are responsible for ensuring that these requirements are met.

B9. Non-direct Measurements:

N/A

B10. Data Management

The field project leader will be responsible for ensuring that all requirements for data management are met. All data generated for this field investigation, whether hand-recorded or obtained using an electronic data logger will be recorded, stored and managed according to the following procedures:

SESD Operating Procedure for Control of Records, SESDPROC-002-R5.
SESD Operating Procedures for Logbooks, SESDPROC-010-R4.

SECTION C: Assessment/Oversight

C1. Assessments and Response Actions

Assessments will be conducted during the field investigation according to the *SESD Operating Procedure for Project Planning*, SESDPROC-016-R2, to ensure the QAPP is being implemented as approved. The Project Leader is responsible for all corrective actions while in the field.

C2. Reports to Management

The Project Leader will be responsible for notifying the Project Manager (Requestor) and appropriate SESD management if any circumstances arise during the field investigation that may adversely impact the quality of the data collected.



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SECTION D: Data Validation and Usability

D1. Data Review, Verification, and Validation

All analytical data will be provided by the SESD Analytical Support Branch and reviewed, verified and validated in accordance with the *SESD Analytical Support Branch Laboratory Operations and Quality Assurance Manual*, July 2011.

All data derived from SESD field measurements will be reviewed, verified, and validated in accordance with the *SESD Operating Procedure for Report Preparation and Distribution*, SESDPROC-003-R3.

D2. Verification and Validation Methods

All analytical data will be provided by the SESD Analytical Support Branch and reviewed, verified and validated in accordance with the *SESD Analytical Support Branch Laboratory Operations and Quality Assurance Manual*, July 2011.

All data derived from SESD field measurements will be reviewed, verified, and validated in accordance with the *SESD Operating Procedure for Report Preparation and Distribution*, SESDPROC-003-R3.

D3. Reconciliation with User Requirements

The usability of all data derived from SESD field sampling and measurements conducted during this field investigation will be evaluated in accordance with the *SESD Operating Procedure for Report Preparation and Distribution*, SESDPROC-003-R3.

****Footnotes:** This Quality Assurance Project Plan (QAPP) has been prepared and approved according to the EPA *Requirements for Quality Assurance Project Plans (EPA QA/R5 EPA/240/B-01/003)*, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, March 2001 (USEPA, 2001). This document will be used to ensure that the environmental data collected for this project are of the type and quality for the intended purposes. **This document is for SESD use only.**



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Table 1
Proposed Soil Sampling Locations: Northern Reservoir
U.S. Finishing/Cone Mills

Station ID	Sample ID	Longitude	Latitude	Analytes*
AOC0101	0101SBxx	-82.431864	34.882878	Metals, SVOCs
AOC0102	0102SBxx	-82.431451	34.882446	Metals, SVOCs
AOC0103	0103SBxx	-82.431038	34.882014	Metals, SVOCs
AOC0104	0104SBxx	-82.430626	34.881582	Metals, SVOCs
AOC0105	0105SBxx	-82.430213	34.881150	Metals, SVOCs
AOC0106	0106SBxx	-82.430606	34.880895	Metals, SVOCs
AOC0107	0107SBxx	-82.431019	34.881327	Metals, Hexavalent Chromium, SVOCs
AOC0107 Duplicate	01907SBxx Duplicate	-82.431019	34.881327	Metals, Hexavalent Chromium, SVOCs
AOC0108	0108SBxx	-82.431431	34.881759	Metals, Hexavalent Chromium, SVOCs
AOC0109	0109SBxx	-82.431844	34.882191	Metals, Hexavalent Chromium, SVOCs
AOC0110	0110SBxx	-82.432257	34.882623	Metals, SVOCs
AOC0111	0111SBxx	-82.432650	34.882368	Metals, SVOCs
AOC0112	0112SBxx	-82.432237	34.881936	Metals, SVOCs
AOC0113	0113SBxx	-82.431825	34.881504	Metals, SVOCs
AOC0113 Duplicate	01913SBxx	-82.431825	34.881504	Metals, SVOCs
AOC0114	0114SBxx	-82.431412	34.881072	Metals, SVOCs
AOC0115	0115SBxx	-82.430999	34.880640	Metals, SVOCs
Quality Assurance Samples				
Soil Trip Blank 1	QA901TS			VOCs
Soil Trip Blank 2	QA902TS			VOCs
Water Trip Blank	QA903TW			VOCs
Equipment Rinse Blank	QA904EB			Metals, Cyanide, SVOCs, VOCs, Pesticides, PCBs
Metals Preservative Blank	QA905PB			Metals
Cyanide Preservative Blank	QA906PB			Cyanide

Note: "xx" in the Sample ID will represent the sample depth and will be determined in the field. Multiple samples may be collected at each station. *Sample locations for PCBs, Pesticides, VOCs, and cyanide analyses to be determined in the field.



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Table 2
Regional Screening Levels (RSLs) for Residential Soil
Metals

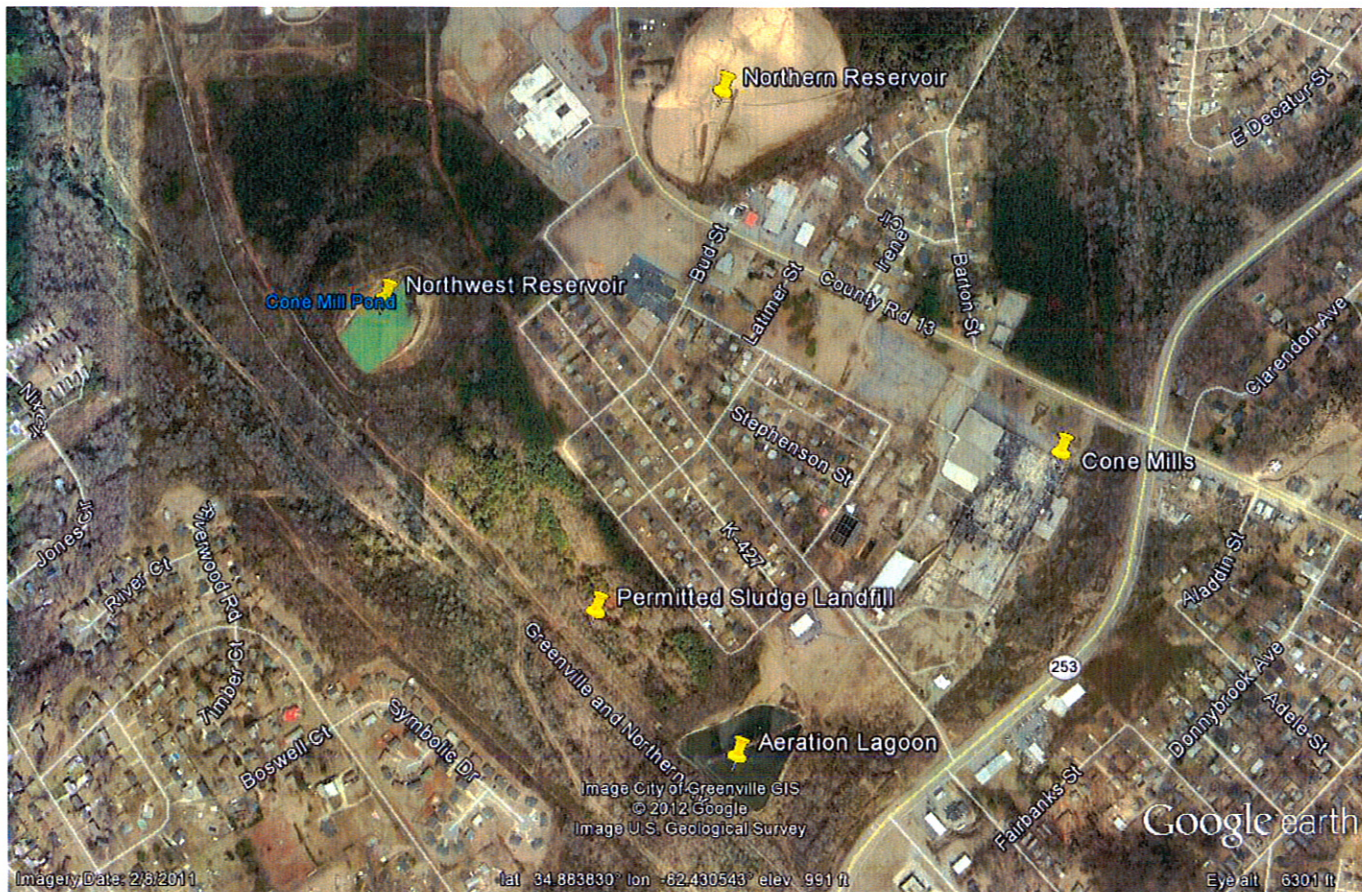
Analyte	Residential Soil RSL (mg/kg)
Aluminum	77,000
Antimony	31
Arsenic	0.39
Barium	15,000
Beryllium	160
Cadmium (Diet)	70
Chromium(III), Insoluble Salts	120,000
Chromium(VI)	0.29
Cobalt	23
Copper	3,100
Cyanide	1,600
Iron	55,000
Lead and Compounds	400
Manganese (Non-diet)	1,800
Mercury (Elemental)	10
Nickel Soluble Salts	1,500
Selenium	390
Silver	390
Thallium (Soluble Salts)	0.78
Vanadium and Compounds	390
Zinc and Compounds	23,000



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Figure 1
Site Map
U.S. Finishing/Cone Mills

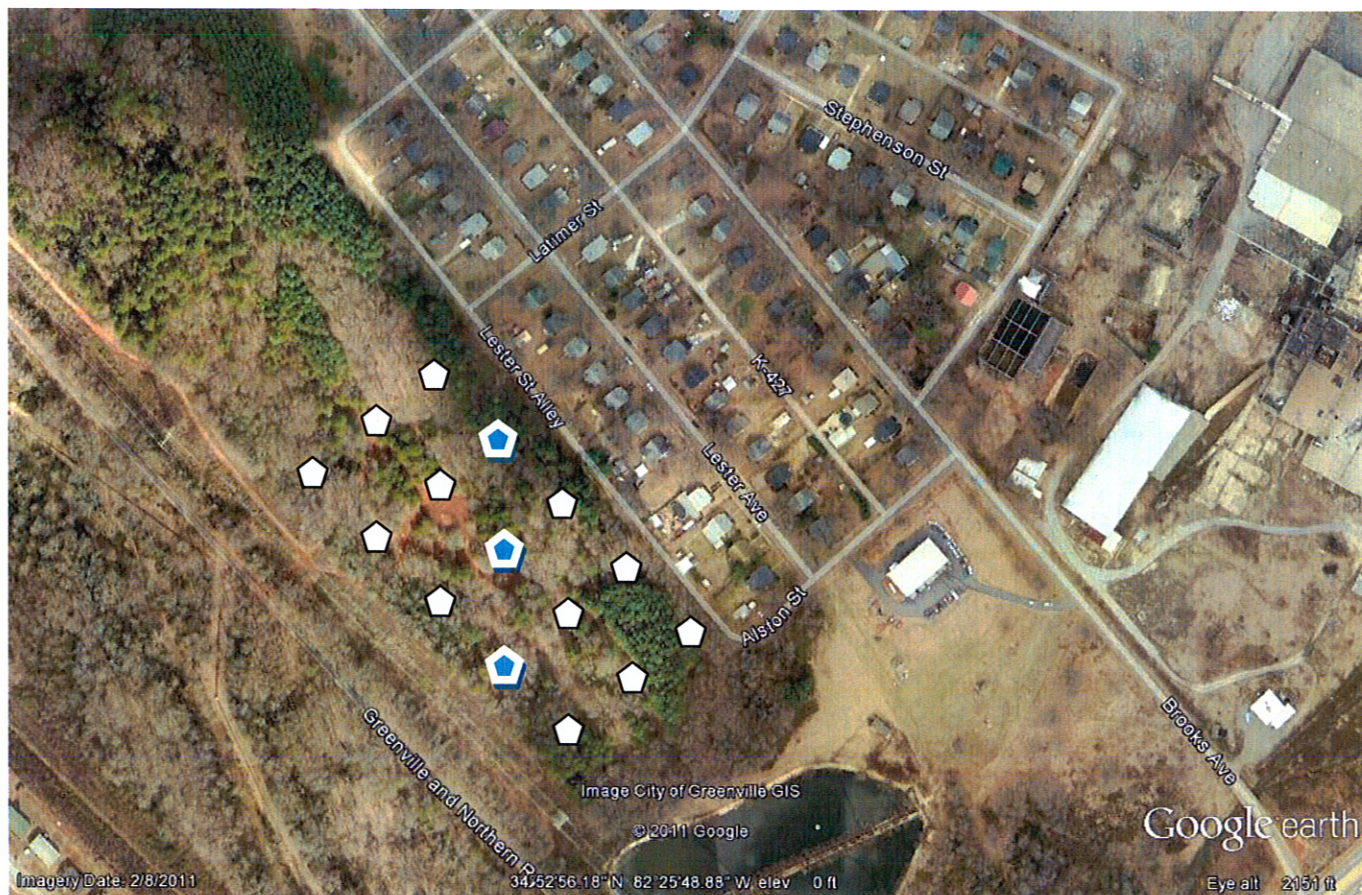




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Figure 2
Proposed Soil Sampling Locations: Permitted Sludge Landfill (AOC 1)
U.S. Finishing/Cone Mills



Note: Locations with blue are to be bored to the water table.