

**MITIGATION ACTION PLAN  
VILLA MOBILE HOME PARK  
BATTERY CASING DUMP SITE  
NCN000410583  
VENICE STREET AT VERONA STREET  
KANNAPOLIS, CABARRUS CO., NC  
S&ME PROJECT 1054-11-2025**

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April 24, 2012

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## LIST OF ACRONYMS

ACL	Alternative Concentration Limit	MSL	Mean Sea Level
AES	Analytical Environmental Services, Inc.	MTBE	Methyl Tertiary Butyl Ether
AS	Air Sparge	MW	Monitoring Well
AST	Aboveground Storage Tank	N/A	Not Applicable
ASTM	American Society for Testing and Materials	NA	Not Analyzed
BDL	Below Detection Limit	NAPL	Non-Aqueous Phase Liquid
bgs	Below Ground Surface	NCDENR	North Carolina Dept. of Environment and Natural Res.
BM	Benchmark	NCDOT	North Carolina Dept. of Transportation
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	ND	Analyte not Detected Above Method Detection Limit
BTOC	Below Top of Casing	NG	Not Gauged
CAP	Corrective Action Plan	NS	Not Sampled
cfm	Cubic Feet per Minute	O&M	Operation and Maintenance
Chem-ox	Chemical Oxidation	ORC	Oxygen Release Compound
COC	Chemical of Concern	ORP	Oxidation Reduction Potential
CPT	Cone Penetrometer Testing	OW	Observation Well
CRF	Cost Review Form	OWS	Oil Water Separator
CW	Compliance Well	Oz	Ounce
DNR	Department of Natural Resources	PAH	Polynuclear Aromatic Hydrocarbons
DO	Dissolved Oxygen	PCBs	Polychlorinated biphenyls
DRO	Diesel Range Organics	PID	Photoionization Detector
DWM	Division of Waste Management	PMW	Proposed Monitoring Well
EDR	Environmental Data Resources, Inc.	Ppb	Parts per Billion
EFR	Enhanced Fluid Recovery	Ppm	Parts per Million
EPD	Environmental Protection Division	Psi	Pounds per Square Inch
ESA	Environmental Site Assessment	PVC	Polyvinyl Chloride
EW	Extraction Well	<RL	Below Reporting Limits
FAP	Flexible Axial Peristaltic	ROI	Radius of Influence
FFD	Fuel Fluorescence Detector	ROW	Right of Way
FID	Flame Ionization Detector	RW	Recovery Well
FOC	Fractional Organic Carbon	SESR	Surfactant Enhanced Subsurface Remediation
fp	Free Product	SIP	Site Investigation Plan
ft	Feet	SISR	Site Investigation Summary Report
gpm	Gallons per Minute	STL	Soil Threshold Level
GRO	Gasoline Range Organics	SVE	Soil Vapor Extraction
Hg	Mercury	SVOC	Semi-volatile Organic Compounds
HVR	High Vacuum Recovery	TBM	Temporary Benchmark
IHSB	Inactive Hazardous Sites Branch	TFR	Total Fluid Recovery
IFT	Interfacial Tension	TMW	Temporary Monitoring Well
IP	Interface Probe	TOC	Top of Casing
ISWQS	In-Stream Water Quality Standards	TPH	Total Petroleum Hydrocarbons
lbs/day	Pounds per Day	TRPH	Total Recoverable Petroleum Hydrocarbons
LUST	Leaking Underground Storage Tank	µg/kg	Micrograms per Kilogram
MCL	Maximum Contaminant Levels	µg/L	Micrograms per Liter
MDPE	Multi-pump Dual Phase Extraction	UIC	Underground Injection Control
MEME	Mobile, Enhanced, Multi-phase Extraction	USGS	United States Geological Survey
mg/kg	Milligrams per Kilogram	UST	Underground Storage Tank
mg/L	Milligrams per Liter	USTMP	Underground Storage Tank Management Program
ml	Milliliter	VOC	Volatile Organic Compound

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## **EXECUTIVE SUMMARY**

The Villa Mobile Home Park Battery Casing Dump (Villa MHP) site is a North Carolina Inactive Hazardous Site located near the intersection of Irene Avenue and Venice Street in Kannapolis (Cabarrus County), North Carolina. In 2010, automotive type battery casings were observed within the soil banks of a stream channel that transects the Villa Mobile Home Park located near the intersection of Venice Street and Verona Street in Kannapolis, Cabarrus County, North Carolina in 2010. Subsequent sampling by the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Quality (DWQ) found pH levels ranging from 6.4 to 6.9 that were within the acceptable range. In addition, results of soil and sediment sampling conducted by Tetra Tech (a US EPA contractor) in August 2010 identified one soil (and its duplicate) sample that contained a concentration of lead that exceeded the EPA Regional Screening Level (RSL) of 400 milligrams/kilogram (mg/kg) for residential soils.

Corrective measures conducted in 2010 included the covering of exposed soil and battery casing pieces with plastic and large rip rap rock. USEPA then transferred regulatory oversight to the NCDENR. Subsequent to USEPA's corrective measure, erosion occurred around the rip-rap and plastic sheeting, exposing battery casing pieces.

In November 2011, the NCDENR, Inactive Hazardous Site Branch (IHSB) contracted S&ME to further assess the soils containing the battery casings and to approximate the extent of battery casings and to provide potential mitigation alternatives. In February and March 2012, S&ME reviewed available historical information; conducted geophysical survey; observed and documented test pits in the area where the battery casings were exposed in an attempt to delineate the horizontal and vertical extent of battery casings near the open channel.

Based on the site activities performed to date, S&ME presents the following findings:

- Area above groundwater: 3,250 square feet of battery casing with an average thickness of approximately 3 feet, which corresponds to 9,750 cubic feet (361 cubic yards) of battery casings;
- Area below groundwater: 400 square feet of battery casings with an average thickness of approximately 1 foot, which corresponds to 400 cubic feet (15 cubic yards) of battery casings;

Based on the site activities performed to date, S&ME presents the following mitigation options:

- Option 1A: Hazardous Disposal Cost: \$500,000 with an estimated time frame of 6-8 weeks;
- Option 1B: Non-Hazardous Disposal Cost: \$600,000 with an estimated time frame of 8-10 weeks
- Option 2A: Hazardous Disposal Cost: \$145,000 with an estimated time frame of 4-6 weeks
- Option 2B: Non-Hazardous Disposal Cost: \$150,000 with an estimated time frame of 6-8 weeks

- Option 3A: Hazardous Disposal Cost: \$100,000 with an estimated time frame of 2-4 weeks
- Option 3B: Non Hazardous Disposal Cost: \$150,000 with an estimated time frame of 3-5 weeks.

The IHSB also requested an estimate to remove surficial battery casings from the stream that receives runoff from the battery casing disposal area. This task would be conducted manually using hand rakes. The project cost and time frame to remove and dispose of observed casing pieces would range from \$5,000 to \$8,000 and take approximately from two days to one week to complete.

## 1. SITE HISTORY

The Villa MHP site (State ID Number NCN000410583) is located near the intersection of Venice Street and Verona Street in Kannapolis, Cabarrus County, North Carolina (**Figure 1**). The site is a residential area containing several mobile homes (**Figure 2**). According to information provided to S&ME, in June 2010 a complaint was received from the City of Kannapolis citing pieces of automotive battery casings were observed within the banks of a stream channel that transects the mobile home park. The stream channel where the battery casings were observed is located south of the intersection of Venice and Verona Streets, immediately adjacent to, and below the southeastern corner of an abandoned mobile home (**Figure 3**).

As a result of the June 2010 complaint, representatives of the NCDENR, DWQ visited the site to observe the area and collected pH measurements from the stream channel in the area of concern as well as at upstream and downstream locations. Reportedly, the results identified pH readings from 6.4 to 6.9; which the NCDENR, DWQ deemed to be acceptable.

In August, 2010, at the direction of the US Environmental Protection Agency (EPA), Region IV, Tetra Tech conducted limited assessment activities of the stream channel area and reported the results in an August 18, 2010 *Final Removal Assessment Letter Report (Assessment Report)*. The assessment activities consisted of the collection of 11 soil and 2 sediment samples from various areas of the site. Five of the soil samples were composite samples and 6 were grab samples. After collection, the NCDENR screened the samples in the field with a portable X-Ray Fluorescence (XRF) analyzer for an indication of lead content. In addition to the XRF field analysis, a portion of the each sample was submitted to an analytical laboratory for analysis of total lead by EPA Method SW-846 6010C. Results of the XRF and laboratory analyses identified lead in one soil sample (and its duplicate) collected of the soils in the open stream channel area at concentrations (4,130 milligrams per kilograms or mg/kg and 5,400 mg/kg, respectively) above the EPA Regional Screening Level (RSL) of 400 mg/kg for residential soils. The remaining samples were below the EPA RSL.

According to information reported in the *Assessment Report* dated August 18, 2010 by Tetra Tech, the exposed soils were covered with plastic and large rip rap rock was placed above the plastic to limit potential exposure and the EPA transferred regulatory oversight back to the NCDENR.

In November 2011, the NCDENR, Inactive Hazardous Site Branch (IHSB) contracted S&ME to further assess the soils containing the battery casings and to generate this report to provide an estimate of the area containing the battery casings and to provide potential mitigation alternatives.

## **2. AREA GEOLOGY AND HYDROLOGY**

### **2.1 General Area Geology and Hydrogeology**

According to the Geologic Map of the North Carolina dated 1985, the site is located in the Charlotte Belt of the Piedmont Physiographic Province (Piedmont) of North Carolina with the underlying bedrock mapped as composed of metavolcanic rock such as interbedded felsic to mafic tuffs and flow rock.

The Piedmont is an uplifted, submaturely to maturely dissected peneplain formed upon moderately resistant rocks. The Piedmont generally consists of well-rounded hills and ridges, which are dissected by a well-developed system of draws and streams and is predominately underlain by metamorphic and/or igneous bedrock. The topography and relief in the Piedmont has developed from differential weathering of the metamorphic and igneous parent rock. Ridges and hills have developed on the less weathered and erodible rock. Because of the continued chemical and physical weather, the rocks in the Piedmont are now generally covered with a mantle of soil that has weathered in place from the parent rock. The soils that form the layer above the bedrock are typically referred to as saprolite. With increasing depth and approaching bedrock, the saprolitic soils typically transition into partially weathered rock. The depths and thicknesses of the soils, partially weathered rock and bedrock surface can vary greatly.

The source of groundwater in the Piedmont is from precipitation in the form of rain and snow. A portion of the precipitation infiltrates into the ground and moves under the influence of gravity to the water table. The slope of the water table under static conditions (no pumping or other outside influence) often approximates the land surface topography and discharge at surface water bodies such as ponds, streams and rivers. Based on local topography, groundwater flow at the site is expected to flow to the stream channel that transects the site, which flows east approximately 500 feet through piping (former tanks) where it discharges to a stream at McClain Road and ultimately flows into Lake Concord, approximately ½-mile southeast (**Figure 1**). Groundwater in deeper aquifers can be influenced by fractures and fractures systems within bedrock or by regional topography.

### **2.2 Site Hydrology**

As stated above, a drainage feature (most of which is now piped with what appears to be old above ground or underground storage tanks with the ends cut off and positioned end-to-end) extends through the Villa MHP to McClain Road, where it discharges to an open stream that flows east-southeast to Lake Concord. **Figure 2** indicates the approximate location of the drainage feature/stream.

According to information relayed to S&ME from residents living near the Villa MHP, during periods of moderate to high precipitation, the current piped stream cannot contain the water flow, and the stream overflows from the headwall located on the north side of Venice Street, and flows overland to the open area approximately 100 feet downstream. This overland flow is estimated to be partially responsible for the erosion of the stream and exposing the area containing the battery casings.

### **3. DELINEATION ACTIVITIES AND FINDINGS**

Based on observations at the site and from conversations with IHSB personnel, it appears that the area containing the battery casings is a former surface drainage feature and/or stream that was piped (using former tanks with the ends cut out) and backfilled with the battery casings and soil. Since the area observed as containing the battery casings is located within the banks of a non-piped section of the stream channel that was exposed due to erosion, the extent, depth, and volume of the battery casings is not discernible based on site observations alone. Therefore, S&ME conducted additional activities in an attempt to delineate the area and volume of the buried battery casings. Site photographs taken of the site, surrounding area, observed battery casings, piping, and various field delineation activities are included in **Appendix I**.

#### **3.1 Review of Available Historical Information**

In an attempt to locate areas that appear to have been disturbed and/or filled in the vicinity of the observed discarded battery casings, S&ME obtained and reviewed historical topographic maps and aerial photographs. The topographic maps and aerial photographs were obtained from Environmental Data Resources (EDR).

##### *3.1.1 Topographic Maps*

Topographic maps of the site area dated 1942, 1950, 1969, and 1987 (photorevised from the 1969 aerial) were viewed for evidence of a former drainage feature in the site area that now contains the identified battery casings and piped stream.

The 1942 topographic map is listed at a scale of 1:125,000 (1 inch = 10,416.7 feet) and does not indicate coverage of the site or surrounding area.

The 1950 topographic map is listed at a scale of 1:24,000 (1 inch = 2,000 feet) and covers the site area, but doesn't contain elevation contours.

The 1969 and 1987 topographic maps are listed at a scale of 1:24,000 and cover the site area; however, both maps indicate the same or similar elevations and contour features in the site area.

Based on the review and comparison of the various topographic maps, no areas of apparent filling were noted. A copy of the 1969 topographic maps is included as **Figure 1** and the historical topographic maps are included in **Appendix II**.

##### *3.1.2 Aerial Photographs*

Aerial photographs of the site area dated 1948, 1961, 1976, 1983, 1993, 1998, 2005, 2006, and 2008 were obtained from EDR. Additionally, the 2010 aerial of the site area was obtained from the Cabarrus County GIS website (**Figure 2**). Each of the aerial photographs was compared for indications of surface disturbance and/or filling.

The 1948 through 1983 aerial photographs are listed at a scale of 1 inch = 1,000 feet; the 1993, 2005, 2006, and 2008 aerials are listed at a scale of 1 inch = 500 feet; the 1998

aerial is listed at a scale of 1 inch = 750 feet; and the 2010 aerial is printed at an approximate scale of 1 inch = 165 feet.

Based on the scale and clarity of the historical aerial photographs, surface disturbance and/or filling could not be observed.

### **3.2 Geophysical Survey**

On January 19, 2012, S&ME completed time domain electromagnetic (TDEM) and ground penetrating radar (GPR) surveys of the accessible areas of the site. These technologies were used in conjunction with each other in an effort to detect the presence of potential buried metallic debris; specifically metal tanks. A brief description of each technology is presented in the following paragraphs.

#### *3.2.1 Time Domain Electromagnetic (TDEM) Methodology*

TDEM methods measure the electrical conductivity of shallow subsurface materials. The conductivity is determined by transmitting a time-varying magnetic pulse into the ground and measuring the amplitude and phase shift of the secondary magnetic field. The secondary magnetic field is created as the conductive materials become an inductor as the primary magnetic field is passed through them.

The TDEM survey was performed with a Geonics EM-61 MKII system, which has a 1.0-meter by 0.5-meter coil system. The EM-61 TDEM system allows discrimination between moderately conductive subsurface materials and very conductive metallic targets as the secondary electromagnetic response from metallic targets are of longer duration than those created by moderately conductive subsurface materials. Accordingly, only the later EM arrivals are recorded so that only the very conductive metallic features are targeted. The survey was designed to locate metallic tanks within depths of about 5 feet, the assumed maximum depth at which we anticipated the top of any metallic buried debris to be present. These data can be acquired with GPS support so the results can be used in Surfer Version 8.0 to geostatistically grid and plot the data.

#### *3.2.2 Ground Penetrating Radar (GPR) Survey*

GPR is an electromagnetic method that detects interfaces between subsurface materials with differing dielectric constants. The transmitter radiates electromagnetic waves into the earth from an antenna moving across the ground surface. Electromagnetic waves are reflected back to the receiver by interfaces between materials with differing dielectric constants. The intensity of the reflected signal is a function of the contrast in the dielectric constant at the interface, the conductivity of the material that the wave is traveling through, and the frequency of the signal.

The GPR survey was performed with a GSSI SIRS-3000 unit equipped with a 400 MHz shielded antenna. The depth of GPR wave penetration at the site is a function of the conductivity of the subsurface materials and signal frequency. The GPR survey settings provided a maximum depth of penetration of approximately 8 feet below ground surface.

### 3.2.3 Discussion and Results

On January 19, 2012, S&ME personnel performed TDEM and GPR surveys to identify subsurface anomalies potentially associated with buried metals in the accessible areas of the parcel. TDEM data were collected along parallel lines spaced at approximate 5-foot intervals as shown in **Figure 1** in **Appendix IV**. A total of two TDEM metallic anomalies (**Anomaly 1** and **2**, **Appendix IV**) not corresponding to site surface features were identified in the TDEM dataset. Both of these features are located in the southern portion of the site (**Figure 2**, **Appendix IV**). The linear northeast-southwest trending TDEM response in the southern portion of the site is associated with an existing underground utility and the additional responses appear to be associated with the existing trailers.

A total of ten GPR profiles were then collected at the site; including across the two anomalies, which are also shown on **Figure 3** in **Appendix IV**. Both TDEM anomalies are characterized by shallow high amplitude GPR reflectors and located within the upper 5 feet. Representative GPR profiles for each anomaly are located in **Figure 4** in **Appendix IV**. The TDEM response and GPR reflections of Anomaly 1 are indicative of metal tanks. GPR reflections of Anomaly 2 are indicative of non-metallic tanks; however, there could be reinforcement in the concrete pavement in this area contributing to the metallic response. Adjacent to these Anomalies, is a relatively strong GPR reflection which could indicate the boundary between original grade and the battery casing/soil fill mix. More detailed information on the presence (or lack thereof) of battery casings could not be determined.

### 3.2.4 Limitations of Geophysical Survey

TDEM and GPR are commonly used to locate buried debris and subsurface targets; however, certain limitations exist. Nearby, metallic objects such as vehicles, metal buildings/storage units, heating/air conditioning units, utilities, etc. will interfere with the TDEM survey. As for GPR, properties of the subsurface materials (e.g., clay content, moisture, etc.) can have a significant impact on the effective depth of penetration of the survey. In addition, due to interference, there may be areas within the proposed survey area where an interpretation of subsurface features was not feasible.

## 3.3 Test Pits

### 3.3.1 Health & Safety Plan

Prior to mobilizing to the site to conduct the intrusive test pits, S&ME prepared a Site Health & Safety Plan (HASP) to comply with 29 CFR 1910.120, hazardous waste operations and emergency response (HAZWOPER) rule for the protection of workers at uncontrolled hazardous sites. A copy of the HASP is included in **Appendix III**. The test pit excavations were conducted on March 6, 2012.

### 3.3.2 Test Pits

S&ME mobilized to the site on March 6, 2012 to perform the test pit explorations in an attempt to delineate the vertical and horizontal limits of the observed automobile battery casings within the banks of the exposed stream channel that transects the Villa MHP.

S&ME was represented by Curtis Helms, Environmental Professional along with Mr. Miguel Alvalle, of the North Carolina Department of Environment and Natural Resources (NCDENR) Inactive Hazardous Sites Branch (IHSB), and a subcontractor (CISCO) for track hoe operation.

Test pit excavation was initially performed by a rubber-tired backhoe but due to low overhead power lines a track-mounted mini-excavator was also utilized. According to S&ME's geophysical survey (TDEM and GPR), the automobile battery casings appeared to be limited to the area immediately surrounding the exposed stream channel; however, due to interference, areas suspected of containing battery casing where an interpretation of subsurface features was not feasible was targeted with the use of test pits. Therefore a total of nine test pits, numbered TP-1 through TP-9, was performed and are indicated on **Figure 3**. The test pits were excavated to depths ranging from 4 feet (ft.) to 7 ft. below the current land surface (bls). The battery casings were encountered in six of the nine test pits (TP-1, 2, 3, 5, 7, and 8) at variable depths and thicknesses. Cross Sections A-A' (**Figure 4**) and B-B' (**Figure 5**) indicate the observations within the test pits and estimates the depths and thicknesses of the soils and battery casings across the area.

The excavated material visually containing automobile battery casings were stockpiled on plastic prior to transportation to a lined roll-off box. After the excavated material was placed into the lined roll-off box, the container was covered, protected, and left on-site awaiting soil sampling analytical results for proper off-site disposal. The test pit logs are included in **Appendix V**.

Test pits (TP-4, TP-6, and TP-9) did not encounter automobile battery casings. Note: that test pit TP-6 was performed within the nearby hillside to a depth of approximately 4 ft. bls. The depth to the automobile battery casings may be present but at a depth greater than the limit of the mini-excavator.

Generally, soils within each test pit were noted to be typical fill material consisting of a conglomerate of non-native sand (coarse and fine), sandy clay, clay silts, sandy silts and clays. Conditions at individual test pits are described on the enclosed logs (**Appendix V**). Excavated soil from the test pits were either placed on plastic sheets and transferred to a lined roll-off box or placed directly into the roll off box. The open pits were then backfilled with fill soil. In addition, the location of each test pit was recorded using a Global Positioning System (GPS) unit with sub-meter accuracy for horizontal control.

### *3.3.3 Composite Sample of Soils Removed from Roll-off Box*

Approximately 12 yds<sup>3</sup> of test pit soil/battery casings was placed into a lined roll-off box for off-site disposal. Prior to demobilization of the roll-off box, one composite soil sample was obtained from material within the roll-off box by hand-augering in four locations at variable depths within the roll-off box and collecting multiple grab samples. The grab samples were combined and mixed to form the composite sample and then placed into laboratory supplied containers for laboratory analysis of Toxicity Characteristic Leaching Procedure (TCLP) by EPA Method 1311 for eight (8) Resource Conservation and Recovery Act (RCRA) metals by EPA Methods 6010 and 7470.

### 3.3.3.1 Results of Composite Sample of Soils Removed from Roll-off Box

The RCRA metals detected above the laboratory report limit are lead at a concentration of 195 milligrams per liter (mg/L) and barium at a concentration of 0.54 mg/L. The lead result was compared to the NCDENR Maximum Concentration of Contaminant for Toxicity Characteristics and was noted above the limit of 5.0 mg/L. The Barium result was also compared to NCDENR Maximum Concentration of Contaminant for Toxicity Characteristics and was noted to be below the limit of 100 mg/L. Since the detected lead leaching concentration exceeded this limit, the soils and battery casings will be transported and disposed off-site at Environmental Quality Company facility located in Canton, Ohio, which is approved to accept RCRA hazardous waste. A copy of the laboratory report and chain-of-custody form is included in **Appendix VI**.

### 3.4 **Estimated Extent of Area Containing Battery Casings**

Based on the results of the various delineation activities, S&ME estimated an area of approximately 3,250 square feet (ft<sup>2</sup>) contained battery casings (**Figure 3**). Although the thickness of the soils containing battery casings varied across the area, S&ME used an average thickness of 3 feet across to approximate the volume of battery casing, which corresponds to approximately 9,750 cubic feet (ft<sup>3</sup>) or 361 cubic yards (yds<sup>3</sup>) of battery casings, excluding soil that may contain lead above action levels. In order to estimate the approximate tonnage that this volume (361 yds<sup>3</sup>) of soils and battery casings would weight, S&ME used a conservative conversion factor of 1.5 tons per cubic yard, which would equal 542 tons of soils and battery casings above the groundwater. Since battery casings were observed in test pit TP-2 extending below the water table surface (**Figure 4**), S&ME estimated that an area measuring approximately 20 feet by 20 feet (400 ft<sup>2</sup>) also contains battery casings below the water table to an average thickness of 1 foot. Therefore, an additional volume of soils and battery casings below the water table in the area of TP-2 is estimated to be 15 yds<sup>3</sup>. Since the soils and battery casings below the water table would be heavier due to the water, S&ME used a conversion factor of 1.75 tons per cubic yard for this additional volume, which equals 26.25 tons.

Based on these values, S&ME estimates the total volume of soils/battery casings in the area investigated is approximately 376 yds<sup>3</sup>, for an approximate total weight of 568 tons.

## **4. MITIGATION OPTIONS OF EXPOSED AND SURROUNDING AREA**

To mitigate the potential threat of further exposure and human contact with the battery casings and soils containing battery casings, S&ME evaluated three options and also estimated an approximate range of costs and time required for each. These are discussed below. The schedules summarized in each of the following options do not include potential permitting requirements for work conducted in a defined stream or stream restoration. **Table 1** summarizes the Mitigation Options and cost details are presented in **Appendix VII**.

### **4.1 OPTION 1: Excavation and Open Chanel Stream Restoration**

This option involves the excavation and off-site disposal of the estimated 376 yds<sup>3</sup> of battery casings and associated soils (entire extent of battery casings); partial removal of Venice Street and the approximate 100 feet of piping (former USTs) that extends from the upstream side of Venice Street to the open/stream erosion area; backfilling the excavation area; and redesign of the stream to be open channel to the remaining pipe/former UST located on the downstream side of the open erosion area.

Due to the volume of battery casings and associated soils to be removed, S&ME has also evaluated separating and segregating the battery casings from the associated soils, doing onsite treatment to stabilize the soils in order to transport and dispose of as non-hazardous waste, rather than hazardous waste. The battery casings would likely remain as hazardous waste for disposal.

#### *4.1.1 Estimated Costs and Schedule – Removal and Disposal*

S&ME estimates that the cost to conduct the mitigation option stated above would range from \$400,000 to \$500,000 if not segregated and stabilized onsite. This includes the removal of all materials (battery casing and associated soils), transported off-site for disposal as a characteristic hazardous waste. The time to complete this option would require approximately six to eight weeks.

#### *4.1.2 Estimated Costs and Schedule – Segregate and Stabilize Soil*

The estimated cost to conduct the mitigation option that would involve the segregation of soil from battery casings, then stabilizing the soil for non-hazardous waste disposal would range from \$500,000 to \$600,000 and take eight to ten weeks. The soils would be transported and disposed of as non-hazardous waste, whereas the battery casings only would require transportation and off-site disposal as a RCRA hazardous waste.

### **4.2 OPTION 2: Limited Excavation and Replacement of Upstream Piping**

This option involves the limited excavation and off-site disposal (exposed material) of an estimated 33yds<sup>3</sup> of battery casings and associated soils located within approximately 7 feet of the stream centerline and open erosion area upstream approximately 25 feet; partial removal of Venice Street and the approximate 100 feet of piping (former tanks)

that extends from the upstream side of Venice Street to the open/stream erosion area; replacing the piping with piping appropriate for no-storm event stream flow to connect with the existing piping (former tank) located downstream of the erosion area; and backfilling the entire area to the original grade. The area of the stream suspected of containing battery casings as discussed with this option is indicated on **Figure 3**.

#### *4.2.1 Estimated Costs and Schedule – Hazardous Waste Disposal*

S&ME estimates that the cost to conduct the mitigation option stated above would range from \$120,000 to \$150,000 and take approximately four to six weeks to complete if not segregated or stabilized onsite, and all removed materials (battery casing and associated soils) were transported off-site for disposal as hazardous waste.

#### *4.2.2 Estimated Costs and Schedule – Segregate and Stabilize Soil*

The estimated cost to conduct the mitigation option of limited excavation and piping replacement would range from \$180,000 to \$220,000 and take approximately six to eight weeks to complete if the battery casings and associated soils were segregated, soils stabilized onsite, and the soils were transported and disposed of as non-hazardous waste, and the battery casing only were transported off-site for disposal as hazardous waste.

### **4.3 OPTION 3: Limited Excavation and Partial Replacement of Upstream Piping**

This option is similar to Option 2 and involves the limited excavation and off-site disposal of an estimated 33 yds<sup>3</sup> of battery casings and associated soils located within approximately 7 feet of the stream channel (both sides) and approximately 25 feet upstream of the open erosion area. One section of stream piping (estimated to be approximately 20 feet) located above the open stream erosion area would be removed, while leaving the remaining upstream piping that is beneath Venice Street in place. The section of remove piping would be replaced with a new section of piping and connected to both the upstream and downstream sections of existing piping (former tanks) located. The newly installed sections would be backfilled and the entire area brought to grade.

#### *4.3.1 Estimated Costs and Schedule - Hazardous Waste Disposal*

S&ME estimates that the cost to conduct mitigation Option 3 as stated above would range from \$80,000 to \$100,000 and approximately two to four weeks to complete if not segregated or stabilized onsite, and all removed materials (battery casing and associated soils) were transported off-site for disposal as hazardous waste.

#### *4.3.2 Estimated Costs and Schedule - Segregate and Stabilize Soil*

It is estimated that the cost to conduct mitigation Option 3 as stated above would range from \$120,000 to \$150,000 and approximately three to five weeks to complete if the battery casings and associated soils were segregated, soils stabilized onsite, and the soils were transported and disposed of as non-hazardous waste, and the battery casing only were transported off-site for disposal as hazardous waste.

## **5. MITIGATION OF OBSERVED SURFICIAL DOWNSTREAM BATTERY CASINGS**

### **5.1 Manual Removal and off-site Disposal**

In order to remove the pieces of battery casings observed along the open section of the stream from McLain Road toward Lake Concord, a contractor will manually remove the observed battery casings by walking, wading, etc., the area. It is also recommended that the contractor use a rake to manually rake the sidewalls and stream bottom to also attempt to remove those pieces that lie just under the sediment surface. The removed battery casings should then be placed in a roll-off box and transported off-site for disposal as hazardous waste. It is estimated that there would be a maximum of 10 yds<sup>3</sup> (15 tons) or one roll-off box generated from along this stream section.

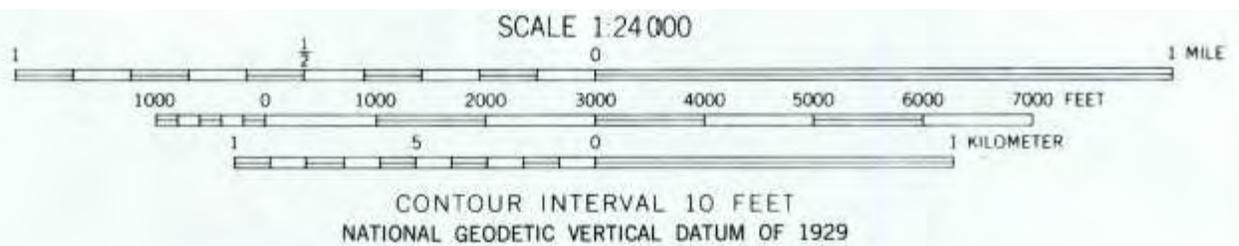
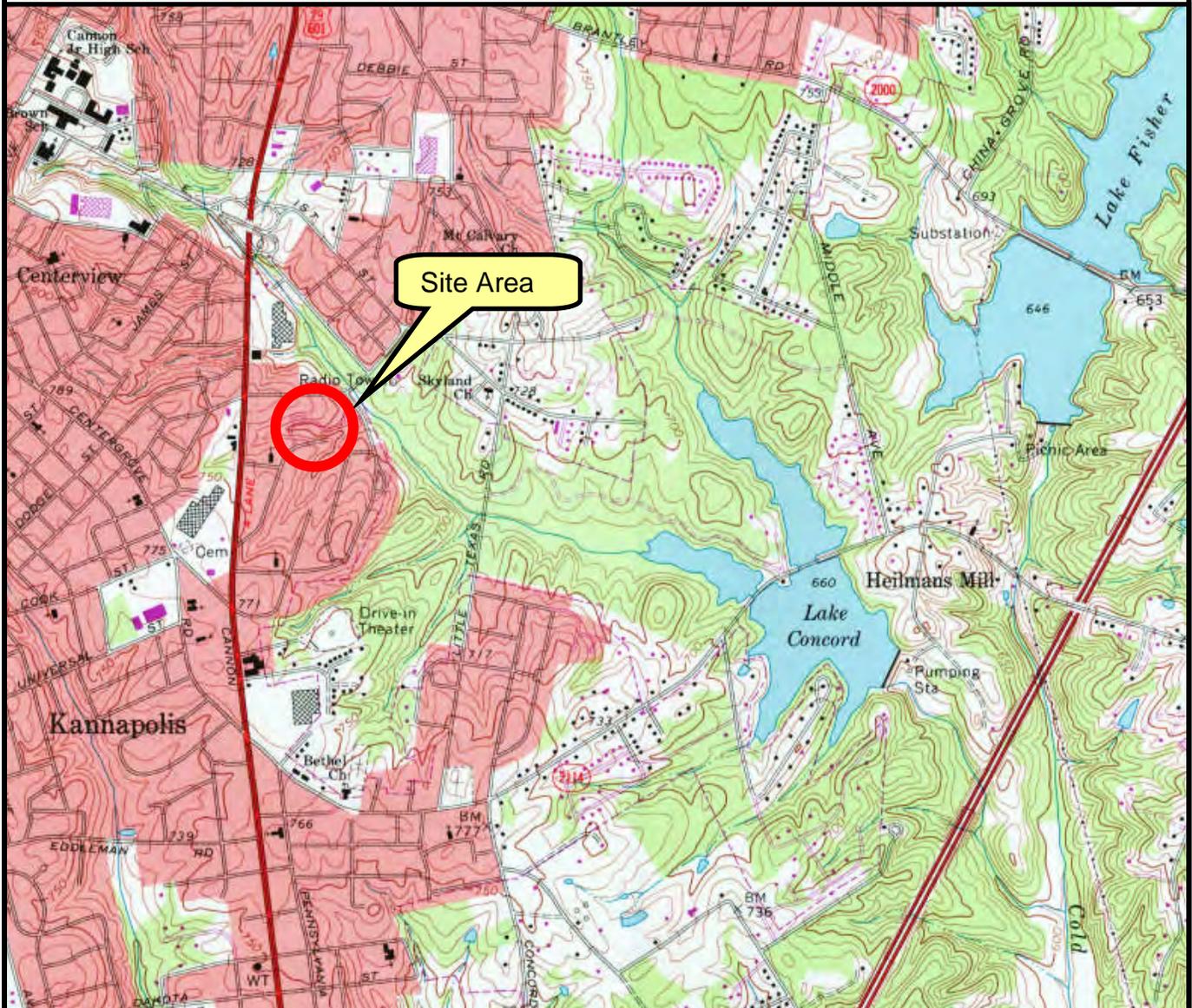
### **5.2 Cost and Schedule**

Based on the removal activity listed above, S&ME estimates that the cost to conduct this removal would range from \$5,000 to \$8,000 and take approximately from two days to one week to complete.

## **6. CLOSING**

S&ME's understands that IHSB will review these options and provide guidance as to which option would be selected. Once selected, S&ME will develop detailed specifications and plans, acquire the necessary permits to implement a final mitigation plan, and provide bid management of at least three contractors to implement the final plan.

## **FIGURES**



Base Map taken from 1969 Concord, NC USGS topographic map photorevised in 1987.

Scale: As Indicated

Drawn by: RAS

Checked by: EW

Date: 03-14-2012

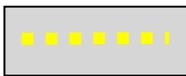
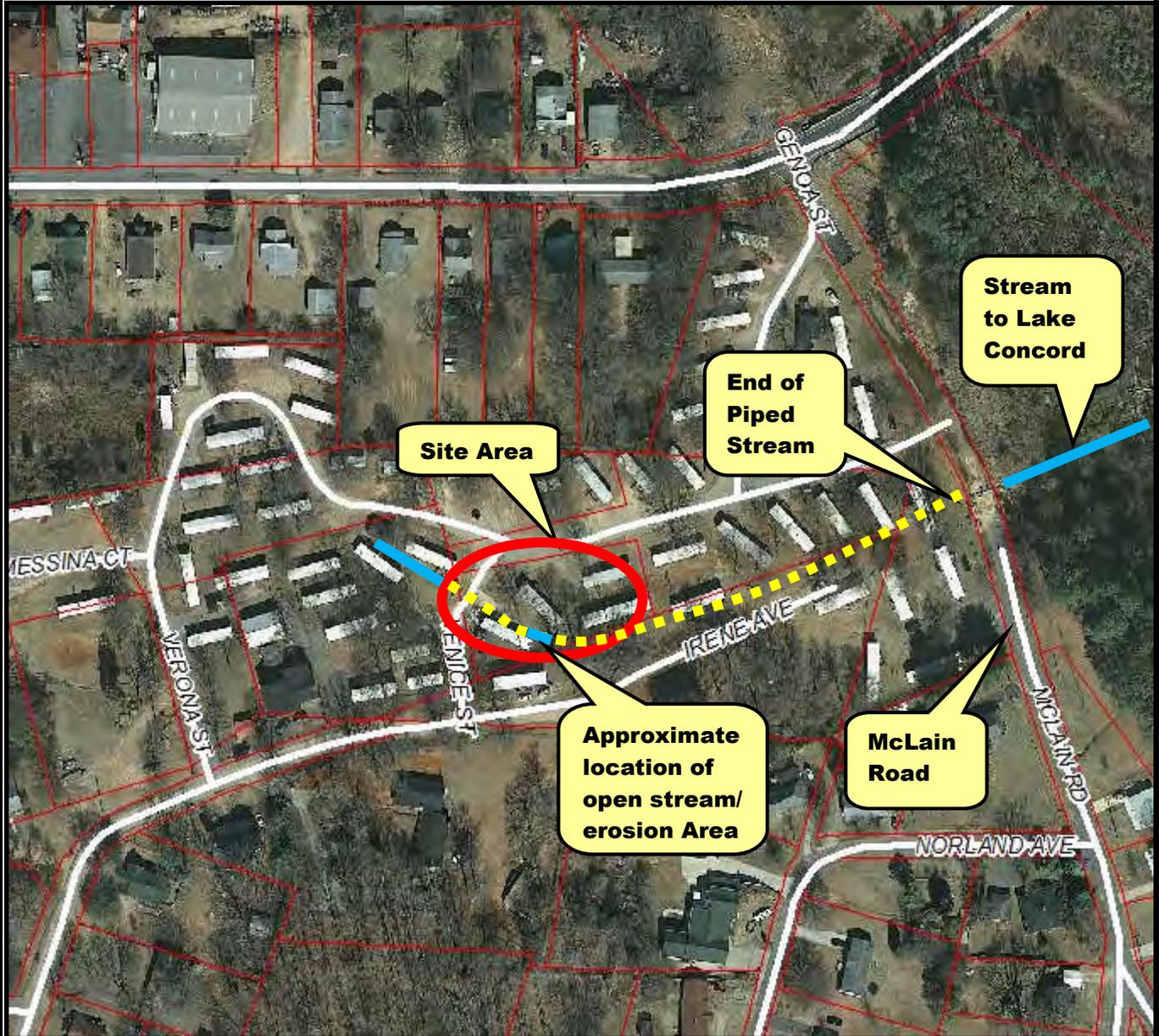


**USGS Topographic Map**  
Villa Mobile Home Park  
Battery Casing Dump Site  
Venice Street at Verona Street  
Kannapolis, North Carolina

Job No.: 1054-11-2025

**Figure**

**1**



Approximate location of piped stream



Approximate location of open stream



Approximate Scale: 1" = 165'

Base Map taken from 2010 Aerial Photograph from Cabarrus County GIS website

Scale: As Listed

Drawn by: RAS

Checked by:

Date: 01-17-2012



**2010 Site Aerial**  
Villa Mobile Home Park – Battery Casing  
Venice Street at Verona Street  
Kannapolis, North Carolina

Job No.: 1054-11-2025

**Figure**

**2**



Battery Casing Excavation Area for Options 2 & 3

-  Test Pits  
(Overburden Thickness / Thickness of Casings)  
(ND) = No Battery Casings Detected
-  Cross Sections
-  Estimated Piped Channel
-  Approximate Stream Centerline
-  Approximate Extent of Battery Casing Dump

**REFERENCE:**  
 2010 AERIAL PHOTOGRAPH WAS OBTAINED FROM NC ONEMAP. PLEASE NOTE THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. IT IS NOT MEANT FOR DESIGN, LEGAL, OR ANY OTHER USES. THERE ARE NO GUARANTEES ABOUT ITS ACCURACY. S&ME, INC. ASSUMES NO RESPONSIBILITY FOR ANY DECISION MADE OR ANY ACTIONS TAKEN BY THE USER BASED UPON THIS INFORMATION.

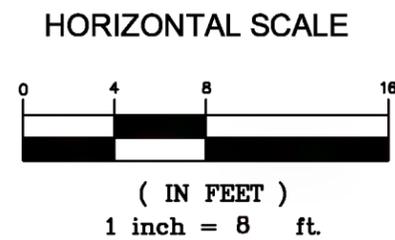
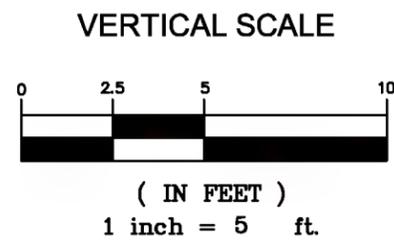
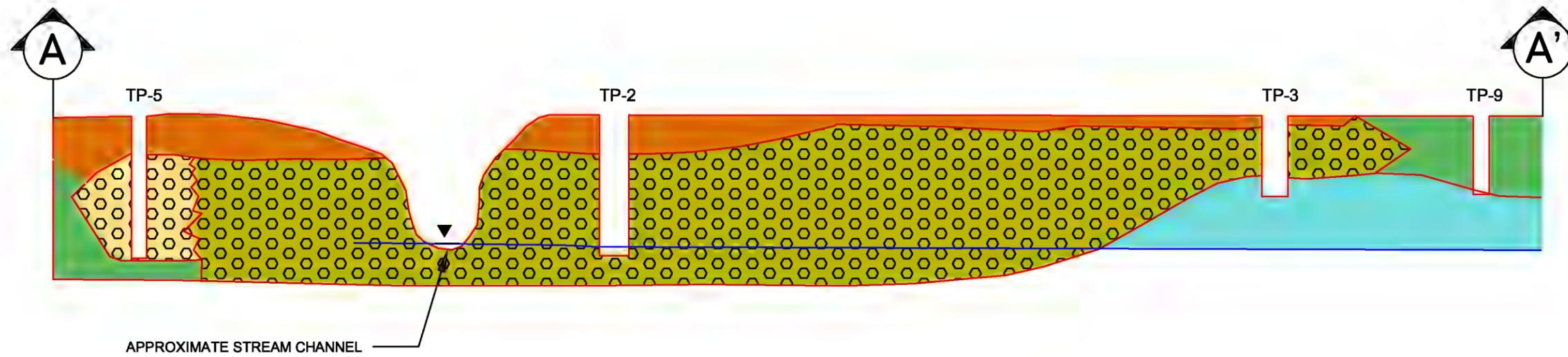
SCALE: 1" = 30'  
 DATE: 04-05-12  
 DRAWN BY: DDH  
 PROJECT NO: 1054-11-2025



**S&ME**  
 WWW.SMEINC.COM  
 ENGINEERING LICENSE NO: F-0176

**SITE MAP WITH  
 EXTIMATED DUMP EXTENT**  
 VILLA MOBILE HOME PARK  
 VENICE STREET AT VERONA STREET  
 KANNAPOLIS, CABARRUS CO., NC

FIGURE NO.  
**3**



**LEGEND**

-  SANDY CLAY
-  CLAY SILT
-  COARSE/FINE SAND
-  SANDY SILT
-  CLAY
-  BATTERY CASING
-  ESTIMATED WATER TABLE & STREAM SURFACE

SCALE: NTS	DATE: 3-28-12
PROJECT NO: 1054-11-202S	DRAWN BY: CLD
ENGINEERING LICENSE NO: F-0176	CHECKED BY:



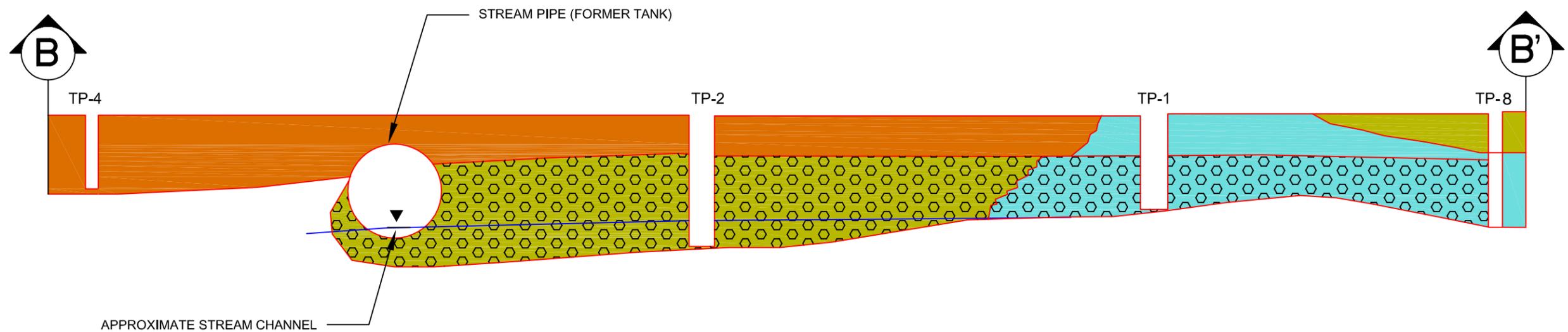
**CROSS SECTION A - A'**

VILLA MOBLIE HOME PARK  
NORTH CAROLINA

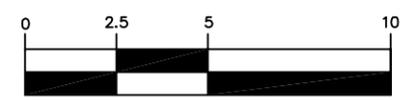
FIGURE NO.

**4**

Drawing path:



VERTICAL SCALE



( IN FEET )  
1 inch = 5 ft.

HORIZONTAL SCALE



( IN FEET )  
1 inch = 8 ft.

LEGEND

- SANDY CLAY
- CLAY SILT
- COARSE/FINE SAND
- SANDY SILT
- CLAY
- BATTERY CASING
- ESTIMATED WATER TABLE & STREAM SURFACE

SCALE: NTS	DATE: 3-28-12
PROJECT NO. 1054-11-2023	DRAWN BY: CLD
ENGINEERING LICENSE NO. F-0176	CHECKED BY:



**CROSS SECTION B - B'**

VILLA MOBILIE HOME PARK  
NORTH CAROLINA

FIGURE NO.

**5**

Drawing path:

## **TABLES**

**Table 1**  
**Summary of Mitigation Cost Options**  
**Villa Mobile Home Park**  
**612 Venice street**  
**Kannapolis, Cabarrus Co., North Carolina**  
**S&ME Proposal No. 1354-**

<b>Option</b>	<b>Approx. Cost</b>	<b>Estimated Completion Time (weeks)</b>	<b>General Scope</b>
<b>1A</b>	\$ 500,000.00	6 to 8	Removal and disposal of concrete, asphalt paving, and upstream concrete headwall; removal of approximately 100 feet of UST culvert; widening stream channel (for open channel design) and stabilizing stream bank; excavation 240 yds <sup>3</sup> overburden; excavating 376 yds <sup>3</sup> battery casing/soil for immediate transportation and disposal as hazardous material; restore work area.
<b>1B</b>	\$ 600,000.00	8 to 10	Removal and disposal of concrete, asphalt paving, and upstream concrete headwall; removal of approximately 100 feet of UST culvert; widening stream channel (for open channel design) and stabilizing stream bank; excavation of 240 yds <sup>3</sup> overburden; excavating 376 yds <sup>3</sup> battery casing/soil and loading into screener; chemically stabilizing soil; collect a composite soil sample for laboratory analysis (TCLP-Lead); load segregated soil into roll-off box for transportation (non-hazardous); load battery casings/soil into roll-off box for transportation (hazardous); import/place backfill material; restore work area.
<b>2A</b>	\$ 145,000.00	4 to 6	Removal and disposal of concrete, asphalt paving, and upstream concrete headwall; removal of approximately 100 feet of UST culvert; furnish/install new headwall; replace approximately 125 feet of new piping; excavation of 33 yds <sup>3</sup> of overburden; limited excavation of battery casing/soil and direct loading into roll-off boxes for transportation and disposal; import/place backfill material (around newly installed pipe); restore work area.
<b>2B</b>	\$ 150,000.00	6 to 8	Removal and disposal of concrete, asphalt paving, and upstream concrete headwall; removal of approximately 100 feet of UST culvert; furnish/install new headwall; replacement of approximately 125 feet of new piping; excavation 33 yds <sup>3</sup> overburden; limited excavation of battery casing/soil and loading into screener; chemically stabilizing soil; collect a composite soil sample for laboratory analysis (TCLP-Lead); load segregated soil into roll-off box for transportation (non-hazardous); load battery casings/soil into roll-off box for transportation (hazardous); import/place backfill material; restore work area.
<b>3A</b>	100,000.00	2 to 4	Removal of approximately 25 feet of UST culvert; replacement of approximately 45 feet of new piping; excavation and stockpiling of overburden; limited excavation of battery casing/soil and direct loading into roll-off boxes for transportation and disposal; import/place backfill material (around newly installed pipe); restore work area
<b>3B</b>	150,000.00	3 to 5	Removal of approximately 25 feet of UST culvert; replacement of approximately 45 feet of new piping; excavation and stockpiling of overburden; limited excavation of battery casing/soil and loading into screener; chemically stabilize soil; collect a composite soil sample for laboratory analysis (TCLP-Lead); load segregated soil into roll-off box for transportation (non-hazardous); load battery casings/soil into roll-off box for transportation (hazardous); import/place backfill material; restore work area

**APPENDIX I**

**SITE PHOTOGRAPHS**

**Villa Mobile Home Park – Battery Casings Dump Site  
Venice & Verona Streets, Kannapolis, NC**

Project #: 1054-11-2025  
Sheet 1 of 7



3201 Spring Forest Road  
Raleigh, NC 27616

<b>Photo 1</b>		
		<b>Date:</b> 01/18/2012
		<b>Photographer:</b> Duane Bents
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC	
<b>Remarks</b>	View of site area from corner of Venice Street & Verona Street, prior to removal of mobile home to right.	

<b>Photo 2</b>		
		<b>Date:</b> 01/18/12
		<b>Photographer:</b> Roger Smith
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC	
<b>Remarks</b>	View west and upstream of exposed/erosion area looking south on Venice Street.	

Photo 3		
	 <p style="text-align: center;">Mobile home</p> <p style="text-align: center;">Former tank used for piping</p>	<p>Date: 01/18/2012</p> <p>Photographer: Duane Bents</p>
	<p><b>Location</b> Villa Mobile Home Park – Battery Casing Dump Site            Venice Street &amp; Verona Street, Kannapolis, NC</p> <p><b>Remarks</b> View of exposed erosion area containing battery casings and plastic and stone rip rap former repair attempt. Looking upstream.</p>	

Photo 4		
	 <p style="text-align: center;">Former tank used for piping</p> <p style="text-align: center;">Former tank used for piping</p> <p style="text-align: center;">Mobile home</p>	<p>Date: 01/18/2012</p> <p>Photographer: Roger Smith</p>
	<p><b>Location</b> Villa Mobile Home Park – Battery Casing Dump Site            Venice Street &amp; Verona Street, Kannapolis, NC</p> <p><b>Remarks</b> View of exposed erosion area containing battery casings and plastic and stone rip rap former repair attempt. Looking downstream with former mobile home to right.</p>	

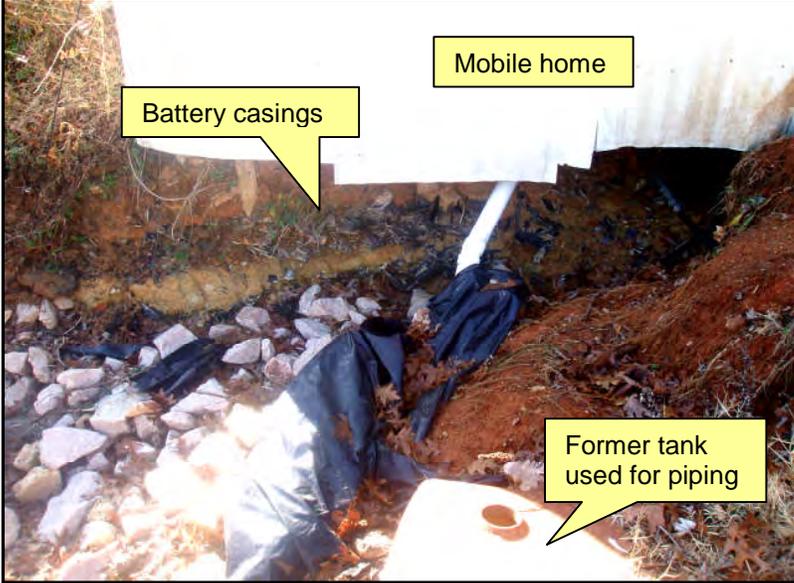
Photo 5		
		<b>Date:</b> 01/18/2012  <b>Photographer:</b> Roger Smith
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC	
<b>Remarks</b>	View of battery casings in stream bank below mobile home.	

Photo 6		
		<b>Date:</b> 01/18/2012  <b>Photographer:</b> Roger Smith
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC	
<b>Remarks</b>	Close up view of battery casings below mobile home.	

Photo 7		
		Date: 01/18/2012  Photographer: Roger Smith
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC	
<b>Remarks</b>	Close up view of battery casings in side of stream channel, near ground surface.	

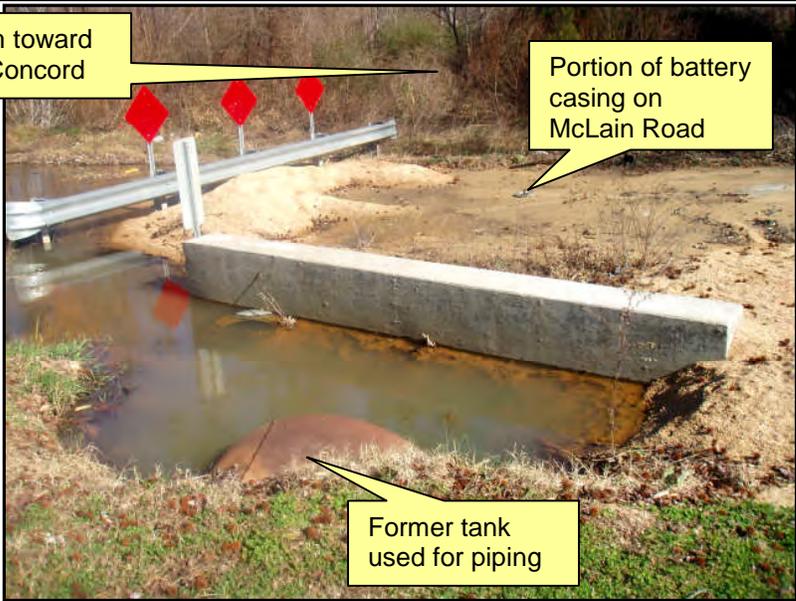
Photo 8		
		Date: 01/18/2012  Photographer: Roger Smith
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC	
<b>Remarks</b>	View of piped stream discharge approximately 500 feet downstream for exposed area at McLain Road.	

Photo 9		
	 <p>Piece of battery casing on McLain Road</p>	<p>Date: 01/18/2012</p> <p>Photographer: Roger Smith</p>
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC	
<b>Remarks</b>	Close up view of pieces of battery casings and sediment deposited on McLain Road, downstream of exposed area	

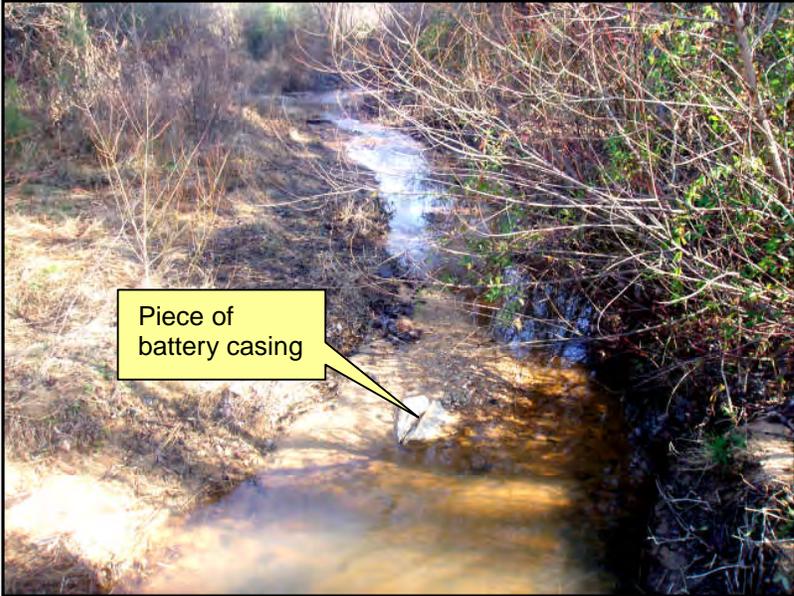
Photo 10		
	 <p>Piece of battery casing</p>	<p>Date: 01/18/2012</p> <p>Photographer: Roger Smith</p>
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC	
<b>Remarks</b>	View of stream below McLain Road with pieces of battery casings	

Photo 11	
	
<b>Date:</b> 03/6/2012 <b>Photographer:</b> Curtis Helms, Jr.	
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC
<b>Remarks</b>	View of site area while conducting geophysical survey

Photo 12	
	
<b>Date:</b> 03/06/2012 <b>Photographer:</b> Curtis Helms, Jr.	
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC
<b>Remarks</b>	Conducting test pit excavations

Photo 13		
		<b>Date:</b> 03/06/2012  <b>Photographer:</b> Curtis Helms, Jr.
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC	
<b>Remarks</b>	View of sidewall of TP-2 with exposed battery casings approximately 2 feet below surface	

Photo 14		
		<b>Date:</b> 03/06/2012  <b>Photographer:</b> Curtis Helms, Jr.
<b>Location</b>	Villa Mobile Home Park – Battery Casing Dump Site Venice Street & Verona Street, Kannapolis, NC	
<b>Remarks</b>	Close up view of battery casings in sidewall of TP-2	

## **APPENDIX II**

### **HISTORIC TOPOGRAPHIC MAPS AND AERIALS**



**Villa Mobile Home Park**

Venice Street & Verona Street  
Kannapolis, NC 28083

Inquiry Number: 3240814.1

January 17, 2012

# EDR Historical Topographic Map Report

# EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

***Thank you for your business.***  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

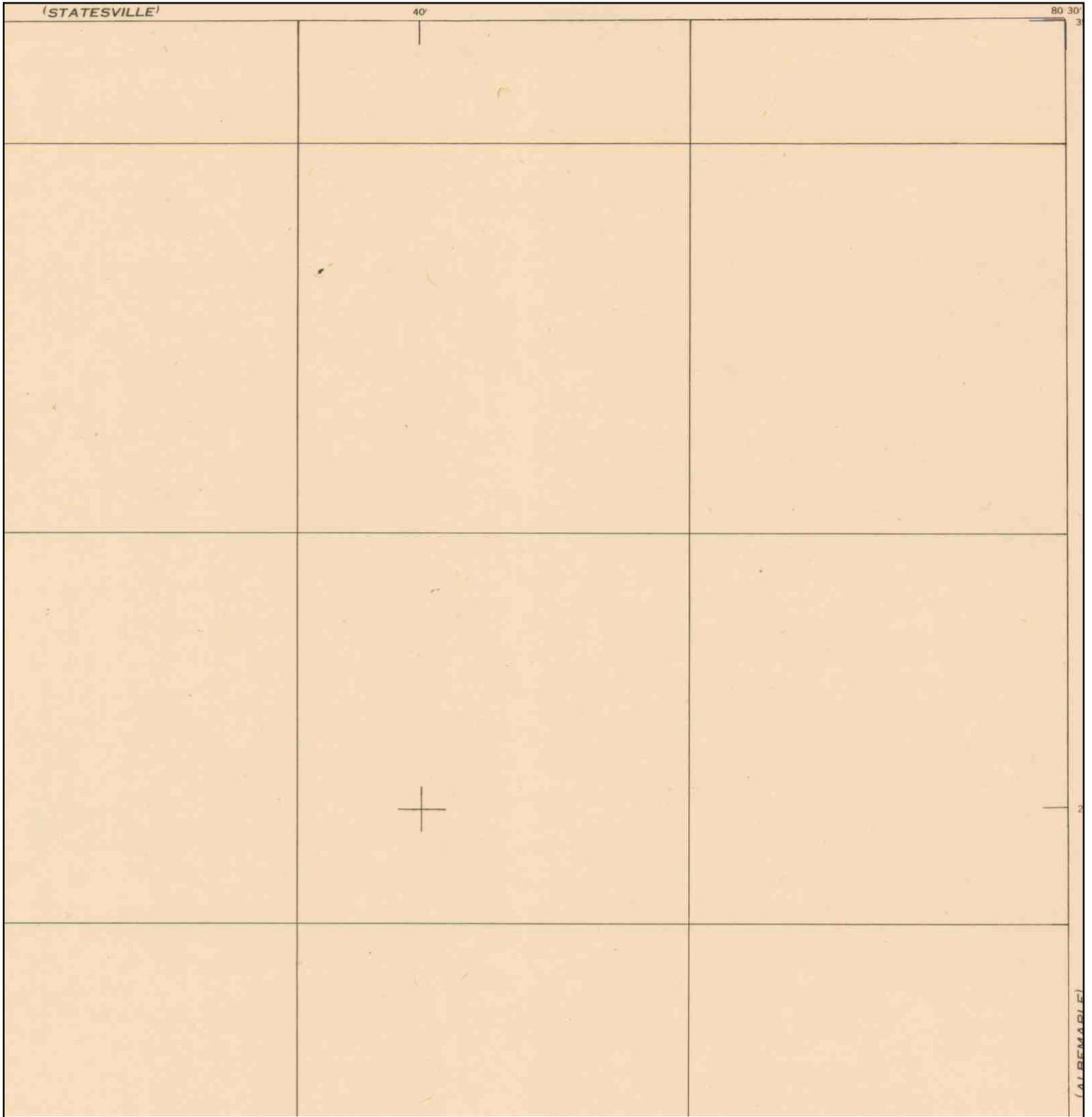
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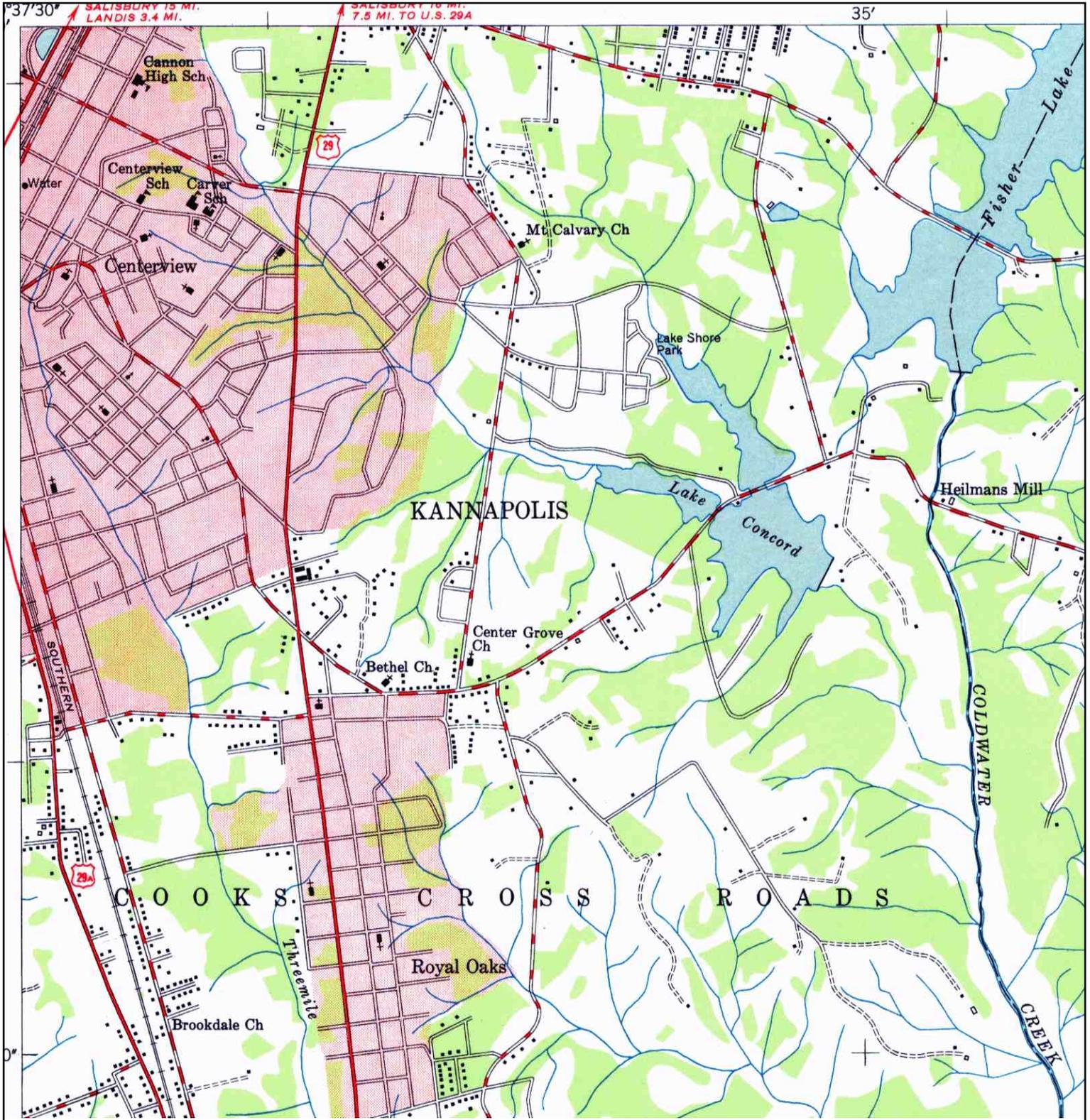
# Historical Topographic Map



## Unsurveyed Area on the Topographic Map

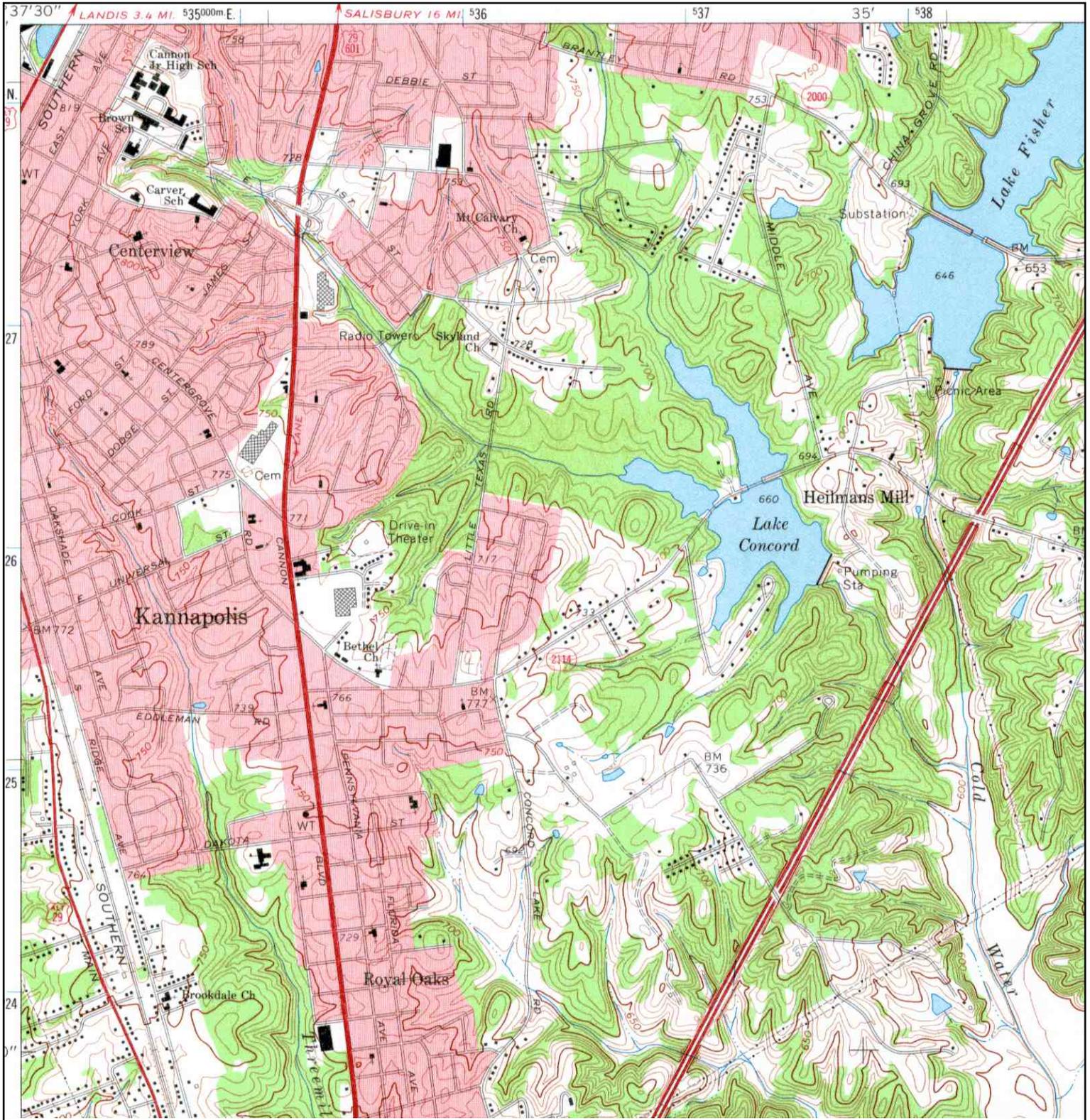
 N	<b>TARGET QUAD</b>	<b>SITE NAME:</b> Villa Mobile Home Park	<b>CLIENT:</b> S&ME
	<b>NAME:</b> CHARLOTTE	<b>ADDRESS:</b> Venice Street & Verona Street	<b>CONTACT:</b> Jena Abney
	<b>MAP YEAR:</b> 1942	<b>LAT/LONG:</b> 35.4857 / -80.6093	<b>INQUIRY#:</b> 3240814.1
	<b>SERIES:</b> 30		<b>RESEARCH DATE:</b> 01/17/2012
	<b>SCALE:</b> 1:125000		

# Historical Topographic Map



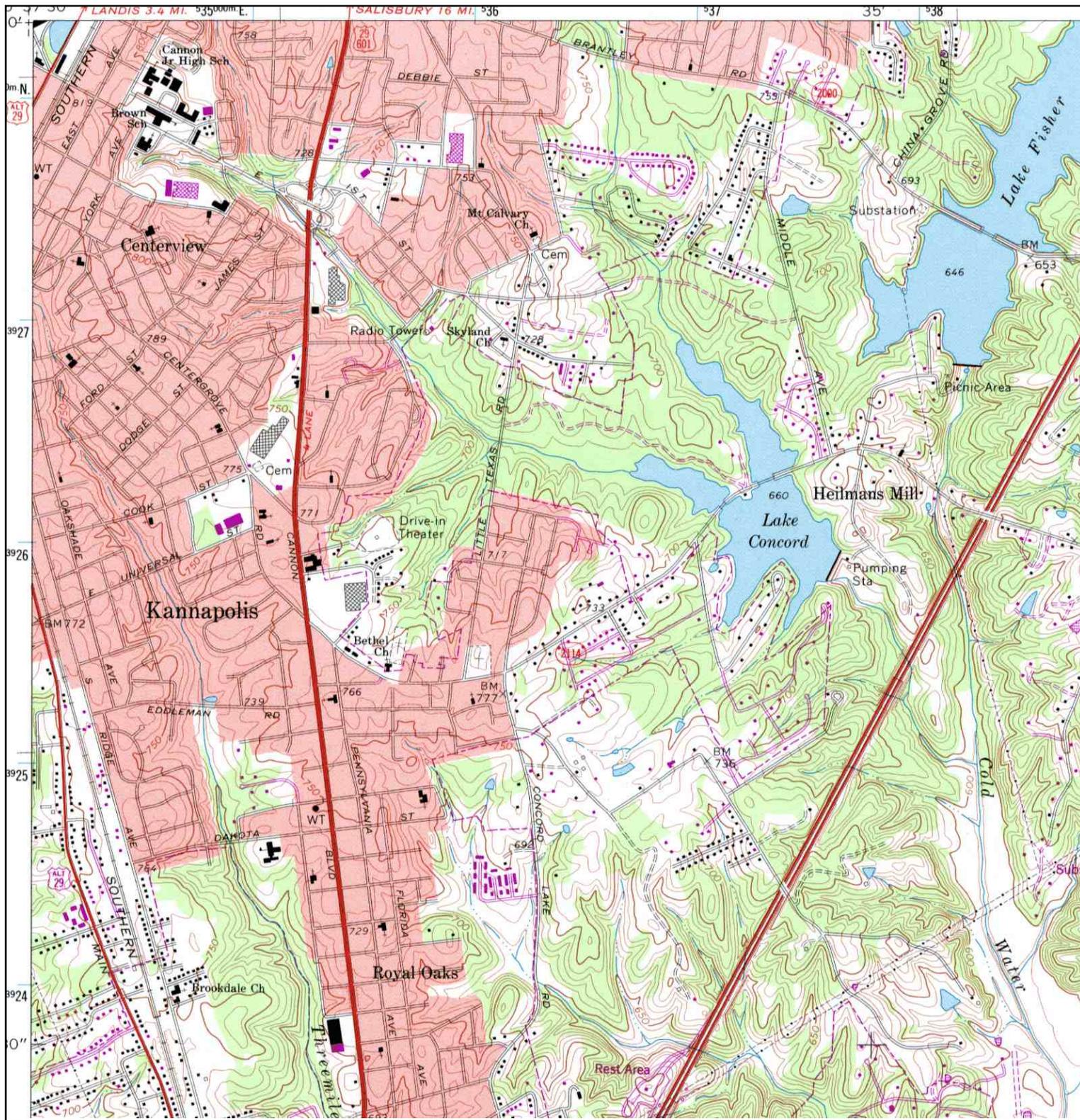
<p>N ↑</p>	<p><b>TARGET QUAD</b>                  NAME: CONCORD                  MAP YEAR: 1950</p>	<p><b>SITE NAME:</b> Villa Mobile Home Park  <b>ADDRESS:</b> Venice Street &amp; Verona Street                  Kannapolis, NC 28083  <b>LAT/LONG:</b> 35.4857 / -80.6093</p>	<p><b>CLIENT:</b> S&amp;ME  <b>CONTACT:</b> Jena Abney  <b>INQUIRY#:</b> 3240814.1  <b>RESEARCH DATE:</b> 01/17/2012</p>
	<p><b>SERIES:</b> 7.5  <b>SCALE:</b> 1:24000</p>		

# Historical Topographic Map



<p>N ↑</p>	<p><b>TARGET QUAD</b>                  NAME: CONCORD                  MAP YEAR: 1969</p>	<p><b>SITE NAME:</b> Villa Mobile Home Park  <b>ADDRESS:</b> Venice Street &amp; Verona Street                  Kannapolis, NC 28083  <b>LAT/LONG:</b> 35.4857 / -80.6093</p>	<p><b>CLIENT:</b> S&amp;ME  <b>CONTACT:</b> Jena Abney  <b>INQUIRY#:</b> 3240814.1  <b>RESEARCH DATE:</b> 01/17/2012</p>
	<p><b>SERIES:</b> 7.5</p>		
	<p><b>SCALE:</b> 1:24000</p>		

# Historical Topographic Map



<p>N ↑</p>	<b>TARGET QUAD</b>	<b>SITE NAME:</b> Villa Mobile Home Park	<b>CLIENT:</b> S&ME
	NAME: CONCORD	<b>ADDRESS:</b> Venice Street & Verona Street	<b>CONTACT:</b> Jena Abney
	MAP YEAR: 1987	Kannapolis, NC 28083	<b>INQUIRY#:</b> 3240814.1
	PHOTOREVISED FROM :1969	<b>LAT/LONG:</b> 35.4857 / -80.6093	<b>RESEARCH DATE:</b> 01/17/2012
	SERIES: 7.5		
	SCALE: 1:24000		



**Villa Mobile Home Park**

Venice Street & Verona Street  
Kannapolis, NC 28083

Inquiry Number: 3240814.2

January 18, 2012

## The EDR Aerial Photo Decade Package

# EDR Aerial Photo Decade Package

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**Date EDR Searched Historical Sources:**

Aerial Photography January 18, 2012

**Target Property:**

Venice Street &amp; Verona Street

Kannapolis, NC 28083

<u><i>Year</i></u>	<u><i>Scale</i></u>	<u><i>Details</i></u>	<u><i>Source</i></u>
1948	Aerial Photograph. Scale: 1"=1000'	Panel #: 35080-D5, Concord, NC;/Flight Date: May 15, 1948	EDR
1961	Aerial Photograph. Scale: 1"=1000'	Panel #: 35080-D5, Concord, NC;/Flight Date: October 04, 1961	EDR
1976	Aerial Photograph. Scale: 1"=1000'	Panel #: 35080-D5, Concord, NC;/Flight Date: March 01, 1976	EDR
1983	Aerial Photograph. Scale: 1"=1000'	Panel #: 35080-D5, Concord, NC;/Flight Date: March 02, 1983	EDR
1993	Aerial Photograph. Scale: 1"=500'	Panel #: 35080-D5, Concord, NC;/Composite DOQQ - acquisition dates: January 28, 1993	EDR
1998	Aerial Photograph. Scale: 1"=750'	Panel #: 35080-D5, Concord, NC;/Flight Date: March 13, 1998	EDR
2005	Aerial Photograph. Scale: 1"=500'	Panel #: 35080-D5, Concord, NC;/Flight Year: 2005	EDR
2006	Aerial Photograph. Scale: 1"=500'	Panel #: 35080-D5, Concord, NC;/Flight Year: 2006	EDR
2008	Aerial Photograph. Scale: 1"=500'	Panel #: 35080-D5, Concord, NC;/Flight Year: 2008	EDR



**INQUIRY #:** 3240814.2

**YEAR:** 1948

 = 1000'





**INQUIRY #:** 3240814.2

**YEAR:** 1961

 = 1000'





INQUIRY #: 3240814.2

YEAR: 1976

| = 1000'





**INQUIRY #:** 3240814.2

**YEAR:** 1983

—|— = 1000'





INQUIRY #: 3240814.2

YEAR: 1993

| = 500'





INQUIRY #: 3240814.2

YEAR: 1998

|—————| = 750'





**INQUIRY #:** 3240814.2

**YEAR:** 2005

| = 500'



**APPENDIX III**

**SITE-SPECIFIC HEALTH  
AND SAFETY PLAN**

**SITE-SPECIFIC HEALTH AND SAFETY PLAN  
 VILLA MOBILE HOME PARK  
 BATTERY CASING DUMP SITE  
 VENICE ST. AT VERONA ST., KANNAPOLIS, NC  
 S&ME PROJECT NO 1054-11-2025**

Prepared for  
 North Carolina Department of Environment and Natural Resources  
 Division of Waste Management  
 Inactive Hazardous Site Branch  
 Superfund Section  
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Prepared by:



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Date Prepared: March 1, 2012 (Rev. 3/22/12)

Plan Author: Roger A. Smith, P.G.

Projected Mobilization Date: March 6, 2012

Reviewed by:

Branch Health & Safety Officer: *Mark Cash* Date: 3/26/12

S&ME Project Manager: \_\_\_\_\_ Date: \_\_\_\_\_

Copies To: Ed Woloszyn Date: \_\_\_\_\_

Copies To: NCDENR IHSB Date: \_\_\_\_\_

Copies To: Roger Smith Date: 3/1/12

Amendments must have the concurrence of both the Branch Health & Safety Officer and Project Manager prior to implementation of each amendment.

AMENDMENT NUMBER	EFFECTIVE DATE	SUBJECT
_____	_____	_____
_____	_____	_____

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- II: Heat & Cold Stress Protocol
- III: Material Safety Data Sheets
- IV: Certification of Site Personnel
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- VIII: Medical Surveillance and Training Status of Personnel
- IX: Amendments to Health & Safety Plan
- X: Directions & Map to Hospital

## 1. INTRODUCTION

### 1.1 Scope and Applicability of the Site Health and Safety Plan

This Site-Specific Health and Safety Plan provides a description of the known existing site conditions as they may affect health and safety; describes activities to assess health and safety requirements; describes levels of personal protective equipment (PPE) that may be required with the criteria for such protection; and provides contingency planning for site communication, emergency equipment, and emergency planning. In addition, the plan provides mechanisms for amending the plan and for assuring that project personnel have read the plan and have met its health and safety requirement such as medical surveillance, respirator fit testing, and training.

### 1.2 Key Personnel

The following personnel, or their designee as appropriate, will carry out the stated job functions on site. One person may carry out more than one job function.

	<b>Job Function:</b>	<b>Name:</b>
A.	Project Manager	Ed Woloszyn
B.	Site Safety Officer	Roger Smith
	Alternate(s)	Curtis Helms, Jr.
C.	Site Manager	Roger Smith
	Alternate(s)	Curtis Helms, Jr.
D.	Crew Chief(s)	Roger Smith
E.	First aid Attendant(s)	Roger Smith
		Curtis Helms, Jr.
	Alternate(s)	

### 1.3 Organizational Responsibility

#### 1.3.1 Project Manager

The project manager is responsible for the design, administration, and implementation of the site activities. The project manager consults with the site personnel regarding all field operations and must obtain approval of alteration(s) of the scheduled site activities.

#### 1.3.2 Site Manager

The site manager reports to the project manager and will:

- A. Assure that appropriate safety material is available, maintained, and properly used by all S&ME and S&ME subcontractor personnel;
- B. Advise personnel of S&ME Safety Policies and their application to potential hazards associated with specific site operations;
- C. Instruct personnel in safe work practices and procedures for dealing with emergencies;

- D. Correct work practices or conditions that may result in injury or exposure to toxic substances;
- E. Supervise and monitor personnel safety performances to ensure required work practices are employed;
- F. Notify corporate safety and the branch health and safety officer of any job related illness or injury;
- G. Assist in the development of Site-Specific Health and Safety Plan; and
- H. Coordinate emergency response activities for on-site personnel and with emergency support groups in the community.

### *1.3.3 Site Safety Officer*

The site safety officer administers the health and safety program at the site and will:

- A. Have the authority to stop the job in order to correct safety and or health deficiencies;
- B. Be on-site and readily available any time work is being done on the site;
- C. Obtain and interpret instrument readings to determine the degree of hazard present;
- D. Determine personal protection levels necessary to ensure personnel safety;
- E. Monitor decontamination procedures;
- F. Evaluate environmental, physical, and chemical hazards, and recommend to the site manager modifications to the Work Plan or the protection levels necessary to ensure personnel safety;
- G. Conduct safety and/or training briefings as necessary;
- H. Ensure that required work practices are utilized by monitoring the safety performance of all personnel;
- I. Report health and safety violations to the site manager; and
- J. Assist in the coordination of emergency response activities for on-site personnel and with emergency support groups in the community.

## **2. SITE HISTORY AND DESCRIPTION**

### **2.1 Description of Site**

The Villa Mobile Home Park Site is located near the intersection of Venice Street and Verona Street in Kannapolis, Cabarrus County, North Carolina. The site is an active residential mobile home park. Due to stream erosion near a former mobile home located at 612 Venice Street, automotive type battery casing were discovered in the stream bank adjacent to, and downstream of the mobile home. In 2010, Tetra Tech collected 11 soil samples along the stream and 2 sediment samples from the stream and submitted for laboratory analysis of lead. Results of the analysis identified total lead 7.8 milligrams per kilogram (mg/kg) to 5,400 mg/kg, with only two samples (one of which was a duplicate) identified above the USEPA Regional Screening Level (RSL) of 400 mg/kg. Following the results, the USEPA covered the exposed battery casings within the stream bank with plastic and rip rap rock in order to minimize potential exposure.

In the fall of 2012, S&ME was contacted by the North Carolina Department of Environment and Natural Resources (NCDENR) Inactive Hazardous Sites Branch (IHSB) with a request to evaluate the area of the identified battery casings and to generate a removal action plan. The site's location and map of the site are included in **Appendix I, Figures 1 and 2.**

## **2.2 Activities Previously Performed on Site**

The following summarizes the activities and reports performed by others for the Villa Mobile Home Park site.

1. Tetra Tech generated a *Final Removal Assessment Letter Report* dated August 18, 2010 that addressed the observations, samples collected, and laboratory results of the soil and sediment samples collected.
2. *Pollution/Situation Report* dated September 29, 2010, by the UST EPA, Region IV. This report described the site and that summarized the sampling results conducted by Tetra Tech in their August 2010 report referenced above.

## **2.3 Area Affected**

The area of concern will be the exposed area containing the battery casings in the stream bank, and where it extends below surface in the exposed area only.

## **2.4 Surrounding Population**

There are several residential homes and trailers within a 500 foot radius of the site.

## **2.5 Topography**

The topography of the site is gently sloping to the east, southeast, along the exposed stream.

## **2.6 Weather Conditions**

The tasks for this project will be conducted during early spring; therefore, weather conditions will be cool. In the event of unseasonably warm weather, the S&ME heat stress protocol is included in **Appendix II**. In the event of unseasonable cold weather in spring, S&ME cold stress protocol will be followed (**Appendix II**).

If severe storms and/or lightning are encountered, work will cease and workers should take cover in the S&ME vehicle or in appropriate shelter until the threat has passed. No activities will be performed when lightning is observed in the area.

# **3. OPERATIONAL SAFETY AND HEALTH RISK ANALYSIS**

## **3.1 Task 1 – Soil Test Pits**

### *3.1.1 Task Description and Location*

S&ME personnel will observe the excavation of test pits in the area of the exposed battery casings in order to assist in defining the extent of the buried battery casings. The test pits will be conducted by a small trackhoe by an experienced equipment operator

with Concord Industrial Company (CISCO). The equipment operator will be OSHA 40 Hr. HAZWOPR trained. All soils and battery casings removed will be placed in a roll-off container, sampled and the container covered, secured, and left on-site until off-site disposal approval is received.

### 3.1.2 Key Personnel

	<b>Job Function:</b>	<b>Name:</b>
A.	Project Manager	Ed Woloszyn
B.	Site Safety Officer	Roger Smith
	Alternate(s)	Curtis Helms, Jr.
C.	Site Manager	Roger Smith
	Alternate(s)	Curtis Helms, Jr.
D.	Crew Chief(s)	Roger Smith
E.	First aid Attendant(s)	Roger Smith
	Alternate(s)	Curtis Helms, Jr.

### 3.1.3 Chemical Hazards

The following substances are known or suspected to be on site. Hazardous Substance Information Forms and/or MSDS for Chemicals of Concern are attached to this Health and Safety Plan as **Appendix III**.

The primary hazards of each substance are identified as follows:

**Substance: Heavy Metals (Such as Lead):**

**OSHA PEL:** 0.050 mg/m<sup>3</sup>

**NIOSH REL:** 0.050 mg/m<sup>3</sup>

**Lower Explosive Limit (LEL) – N/A**

**Upper Explosive Limit (UEL) – N/A**

**Flash Point – N/A**

**Medium – Soil**

**Primary Hazard:** lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension.

#### 3.1.3.1 Methods / Equipment Used to Protect Employees from Hazards

The personal protective equipment (PPE) used to protect employees from chemicals of concern will be Level D (refer to **Section 5.0**) includes safety glasses, nitrile gloves, steel toe boots.

### 3.1.4 *Biological Hazards*

- Black widow spiders
- Fire ants, wasps, hornets
- Ticks
- Poisonous snakes
- Mosquitoes

#### 3.1.4.1 Methods / Equipment Used to Protect Employees from Hazards

Use insect repellent and be aware of potential hazards in the work area. Do not disturb ant mounds or loose dirt piles in grassy areas.

### 3.1.5 *Physical Hazards*

- Vehicle traffic
- Walking on uneven surfaces during field activities
- Vacant buildings, etc.

#### 3.1.5.1 Methods / Equipment Used to Protect Employees from Hazards

Be aware of traffic and follow S&ME struck-by prevention policy procedures. Wear high-visible safety vest when walking on roadways. Utilize traffic barriers and cones when necessary. Keep your eyes on path during site visit and when walking around property.

### 3.1.6 *Operational Hazards*

- Potential contact with contaminated soil, groundwater, surface water
- Potential contact with backhoe

#### 3.1.6.1 Methods / Equipment Used to Protect Employees from Hazards

Don appropriate PPE (Refer to **Section 5.0**) when performing activities where exposure potential is present.

Personnel to monitor breathing zone when opening wells and vents with PID to measure VOCs.

### 3.1.7 *Other Hazards*

Hot or cold weather extremes, storms.

#### 3.1.7.1 Methods / Equipment Used to Protect Employees from Hazards

Work within the limitations of the S&ME heat stress or cold stress protocol, which is contained in **Appendix II**. If severe weather arises, cease work and take shelter in the truck or in a safe building.

**4. PERSONAL PROTECTIVE EQUIPMENT**

**4.1 LEVELS OF PROTECTION**

Based on the evaluation of the potential hazards on the site, the following levels of personal protection have been designated for the following applicable work areas and tasks:

LOCATION	TASKS	LEVEL OF PROTECTION			
Work Zone	1 _____	A	B	C	D
Other	_____	A	B	C	D
Other	_____	A	B	C	D
Other	_____	A	B	C	D

The hazardous substance forms and manufacturers specifications have been used to determine the chemical resistance and integrity of protective equipment.

Specific protective equipment for each level of protection is as follows:

**NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE WITHOUT THE APPROVAL OF BOTH THE SITE SAFETY OFFICER AND THE SITE MANAGER.**

**4.2 Level A Personal Protective Equipment**

No Level A will be conducted under this Site-Specific Health and Safety Plan.

**4.3 Level B Personal Protective Equipment**

Under this Site-Specific Health and Safety Plan, work will not be done if Level B PPE is required.

**4.4 Level C Personal Protective Equipment**

Under this Site-Specific Health and Safety Plan, work will not be done if Level C PPE is required.

**4.5 Level D Personal Protective Equipment**

**4.5.1 Level D equipment for Task number(s) Task 1, 2**

- A. Outerwear: Long pants, short sleeves or Coveralls
- B. Hard hat: When overhead hazards exist
- C. Gloves: Chemical resistant Type (Disposable Nitrile) or work gloves
- D. Boots: Steel-toed boots
- E. Glasses: Safety glasses or Safety Eyewear
- G. Safety Vest: High visibility safety vest when working near roadways.

#### **4.6 Reassessment of PPE**

If additional chemicals or hazards are found to be present on site, or if the PPE chosen does not function properly, then the site health and safety officer will reassess the type of PPE that is being used. These changes shall be noted and approved in **Appendix VIII** “Amendments to Site Health & Safety Plan”.

#### **4.7 Work Mission Duration**

The test pit excavation is allocated for one working day.

#### **4.8 SOP Personal Protective Equipment**

The hazardous substance forms and manufacturer’s specifications have been used to determine the chemical resistance and integrity of protective equipment. The project manager or site safety officer knowledgeable in the proper application of personal protective equipment will select equipment based on anticipated hazards.

##### *4.8.1 Applicability*

All employees covered by this plan are required to adhere to the PPE requirements of this plan. Failure to do so may result in being directed to leave the site, and disciplinary action including termination may result.

##### *4.8.2 Training*

Employees shall be trained in the proper use, care, limitations, and in how to don and doff any PPE they may be required to use.

### **5. MEDICAL SURVEILLANCE REQUIREMENTS**

S&ME has established a Medical Surveillance Program (Program) for employees who may need to wear a respirator while involved in the evaluation and cleanup of hazardous waste sites. The purpose of the Program is to identify illnesses or problems that could put an employee at an unusual risk from exposures. The Program will help see that each employee can safely use negative pressure respirators and withstand heat stress. Information gathered during the Program will be used to establish and maintain a medical database for employees in order to monitor any abnormal conditions, which may be related to work exposure. S&ME maintains the right to exclude certain individuals from particular assignments based on previous exposures and/or examination results. The Program includes:

- A. A baseline physical examination;
- B. The review of each Site-Specific Health and Safety Plan and potential exposure list to determine the need for specific biological and medical monitoring;
- C. Medical evaluation after known or suspected hazardous exposures;
- D. Annual and exit physical examinations with attention given to specific exposures and/or symptoms.

## 5.1 Site Specific Monitoring

Personnel on site will monitor each other and use warning properties such as odor to monitor the work area. When opening wells and vents, a PID will be used to measure the breathing zone and ambient air levels.

## 5.2 Documentation

Personnel medical surveillance documentation can be found in **Appendix VIII**, “Medical Surveillance and Training Status of Personnel”.

## 6. AMBIENT AIR MONITORING REQUIREMENT AND ACTION LEVELS

### 6.1 Ambient Air Monitoring

In the potentially contaminated area, such as near the wellheads a PID or FID will be used when opening the wells and vents.

### 6.2 Instrument Calibration

All equipment shall be either factory calibrated or field calibrated at the start and end of the day. The readings shall be recorded with the instrument readings that were taking between calibrations.

### 6.3 Visual

If dust is generated soils will be misted to keep dust levels down if needed to protect the environment and the surrounding public population.

### ACTION LEVELS

TASK #	AMBIENT HAZARD	MONITORING EQUIPMENT	FREQUENCY	ACTION LEVEL	ACTION
1	Lead Dust	Visual	When test pits are conducted	Obvious Airborne Dust	If Airborne dust is observed, either evacuate the area until such time that dust is not generated or institute some time of engineering controls (e.g., spray with misted water).

### 6.4 Ambient Air Monitoring

The ambient air readings will be recorded to document levels and used as a measure for public protection to determine a distance to cordon off the work area, if needed.

## 7. SITE CONTROL MEASURES

### 7.1 Buddy System

Where possible, employees will be organized into work groups in such a manner that each employee of the work group is designated to be observed by at least one other

employee in the work group. This applies to tasks performed in the area of concern or on-site when heavy equipment is in operation.

## **7.2 Communications Procedures**

Four vehicle horn blast repeated several times is the emergency signal to indicate that all personnel should leave the work area.

The following standard hand-signals will be used in case of failure hear verbal commands:

HAND CLUTCHING THROAT - Out of air, can't breathe

HANDS ON TOP OF HEAD - Need assistance

THUMBS UP - OK/I'm alright/I understand

THUMBS DOWN - No/negative

GRIP PARTNER'S WRIST - Leave area immediately

BOTH HANDS AROUND PARTNER'S WAIST - Leave area immediately

## **7.3 On-site Command Post**

The on-site Command Post and staging area will be established at the S&ME vehicle that is parked upwind of the work area by at least 25 feet.

## **7.4 Designated Eating Areas and Smoking Areas**

The designated eating areas for operations personnel will be established in the S&ME vehicle or off-site. Smoking will only be permitted in designated smoking areas outside of the project site.

## **7.5 Personnel Site Activity Log**

All personnel and visitors must sign in and out when entering or leaving the site. This shall be documented on **Appendix VI**, "Personnel Site Activity Log".

## **7.6 Visitors**

Typically, non-S&ME employees and non-client employees will not be allowed to visit the site unless pre-approvals are obtained from both the site manager and the client. However, this site is adjacent to a residential area and there is a possibility of on-lookers during work activities.

## **7.7 Safe Work Practices**

- A. Appropriate PPE shall be worn at all times as indicated by this plan.
- B. Eating, drinking, smoking, chewing gum or tobacco, are prohibited at or within 25 feet of the work area or sampling locations.
- C. Hands, forearms, and face will be thoroughly washed with soap, rinsed and dried upon leaving the Area of Concern and prior to eating or drinking.
- D. Contact with potentially contaminated area or soil should be avoided – do not walk through puddles, pools, mud, etc. Whenever possible, avoid kneeling, leaning, or sitting on the ground or on equipment.

- E. Do not allow dusting; use water (light mist) to control dust; avoid runoff.

## **8. DECONTAMINATION PLAN**

Decontamination of equipment/boots will be required after completion of days activities.

### **8.1 Standard Operating Procedures for Decontamination**

The equipment will be cleaned using detergent solution washes and clean DI water rinses before each use.

### **8.2 Decontamination Equipment and Decontaminating Solutions**

The following decontamination equipment and solutions will be utilized on this site: Liquinox, and deionized (DI) water.

### **8.3 Decontamination Sequence**

#### *8.3.1 Personnel*

- A. Change out disposable gloves
- B. \_\_\_\_\_
- C. \_\_\_\_\_

#### *8.3.2 Equipment, Type(s)*

- A. Spray with non-phosphate soap
- B. Spray with deionized water
- C. \_\_\_\_\_
- D. \_\_\_\_\_

### **8.4 Containment and Disposal of Contaminated Solutions and Waste**

#### *8.4.1 Containment*

IDW comprised of soil, battery casings, and disposables will be containerized in a lined roll-off box for off-site disposal, once determined if hazardous/non-hazardous.

## **9. CONFINED SPACE ENTRY PROCEDURES**

No confined space entry will be conducted under this Site-Specific Health and Safety Plan.

## **10. SPILL AND STORMWATER POLLUTION CONTAINMENT PROGRAM**

A spill containment kit will be available on-site in the event of an accidental spill from a 5-gallon bucket containing decontamination water. Spill containment kit will consist of kitty litter or other suitable material for absorbing liquids. The spent material will be collected and disposed in a lined roll-off box for off-site disposal.

## **11. EMERGENCY RESPONSE/CONTINGENCY PLAN**

### **11.1 Personnel Roles/Lines of Authority**

In the event of an on-site emergency during the field investigation, the S&ME Site Safety Officer or his or her designee will serve as Emergency Coordinator. The Emergency Coordinator shall be responsible for notification and coordination with off-site services if necessary. The Emergency Coordinator has the authority to commit team resources as may be required to prevent, reduce or eliminate the emergency.

### **11.2 First Aid**

There will be at least one individual on site while conducting Task 1 who is certified and current in cardiopulmonary resuscitation (CPR) and first aid. This individual will provide limited services while waiting for trained medical personnel.

### **11.3 Emergency Recognition, Prevention and Reporting**

The project manager, the Site Safety Officer, and the project coordinator shall be notified promptly by phone of any on-site emergency.

#### *11.3.1 Fire/Explosion*

Twenty-pound dry chemical fire extinguishers shall be available on each vehicle and piece of heavy equipment on-site and in the Contamination Reduction Zone. Any fire, regardless of how small or contained, must be reported to the local fire department immediately.

#### **Procedures for a fire or explosion**

- A. The Emergency Coordinator shall sound the emergency site signal and notify the local fire department. The signal for a fire/explosion is **one long blast of the truck horn**.
- B. Emergency team members shall position themselves upwind of the fire to avoid smoke and potentially toxic vapors/gases and shall use on-site fire extinguishers and shovels to contain the fire.
- C. Site personnel shall turn fire-fighting responsibilities over to fire department personnel upon their arrival, assisting only as specifically directed by such personnel.
- D. In the event of an evacuation order, personnel shall assemble at the Command Post for instructions and head count by the Emergency Coordinator.
- E. The "Buddy System" will be used for site investigation operations as well as in emergencies.

#### *11.3.2 Personnel Injury/Chemical Exposure*

In the event of personal injury or chemical exposure to a member of the work team, the Emergency Coordinator and the Project Manager shall be immediately notified.

A team member must accompany injured personnel to the emergency care facility that can provide medical personnel with information relative to the injury or exposure. In the case of an exposure, the Hazard Assessment Section of this document shall be made available to the medical personnel.

If the injured person's clothing is contaminated with potentially toxic materials, remove as much clothing as possible. Clothing is not to be removed from burn victims. For minor injuries, normal decontamination procedures shall be followed. Care must be taken to avoid the injured area with decontamination solutions and equipment.

### *11.3.3 Spills, Leaks and Discharges*

In the event of a spill, leak or discharge of contaminants, which may pose a threat to human health or the environment, including nearby residents, the Emergency Coordinator shall make an immediate assessment of the threat. In performing the assessment, determination will be made whether or not the accident may result in:

- A. A threat to field teams requiring an increase in levels of PPE;
- B. A threat to residents, workers or other members of the community near the site requiring notification of the local authorities;
- C. A threat to uncontaminated areas requiring immediate action to protect these areas;
- D. An increase or change in the potential environmental hazards already present, requiring an alteration of work plans

Actions which may be appropriate pending the results of the assessment include:

- A. Halt all on-site work activities and/or evacuate the site;
- B. Call local authorities and evaluate the potential need for downwind evacuation of off-site personnel;
- C. Implement the spill control/reduction procedures, or request assistance from local authorities for spill control;
- D. Revise work plan to eliminate the need to enter critical areas;
- E. Abandon work until the incident has stabilized.

The assessment and response actions shall be coordinated with applicable contract and government personnel who have authority or jurisdiction on the site.

### **11.4 Evacuation Plan**

All site personnel will be evacuated from the work area if either the Site Manager or the Site Health and Safety Officer decide that personal safety of personnel is in danger. If evacuation is necessary, personnel will be notified by **verbal communications and the blasting of an automobile horn in a sequence of four blasts repeatedly until all personnel have evacuated** the work area. The following procedures will apply during emergency evacuation.

- A. Immediately upon completion of the decontamination procedures, personnel will proceed to the command post, contact the Emergency Coordinator.

- B. Personnel not requiring decontamination (those outside the contamination reduction zone) will proceed immediately to the command post and assemble there for instructions.
- C. Upon arriving at the command post assembly area, all personnel must check in with the checkpoint controls person if such is designated. All personnel responsible for emergency procedures, such as CPR, first aid, fire control, etc., will identify themselves to the Site Health and Safety Officer.
- D. The Buddy System will be followed throughout the evacuation procedure.

### **11.5 Emergency Escape Route**

The following emergency escape routes are designated for use in those situations where exiting the Area of Concern cannot occur through the decontamination area, site personnel will leave the site using the nearest upwind exit.

### **11.6 Critique of the Emergency Response Plan**

After the emergency is stabilized or controlled, personnel who participated in the emergency shall critique the Emergency Response Plan for effectiveness. It will then be amended as necessary to meet potential emergencies in the future. Appropriate records shall be maintained and filed with regulatory agencies as required.

### **11.7 Local Emergency Response Plan**

#### *11.7.1 Hospital (See attached map – Appendix X)*

Name: Carolinas Medical Center – Northeast  
Address: 920 Church Street North  
Concord, NC 28025  
Phone Number: (704) 403-3000

Directions from SITE:

See attached. Total Distance: 3.8 miles time = 9 minutes.

#### *11.7.2 Ambulance*

Phone: 9-1-1

#### *11.7.3 Fire Department*

Phone: 9-1-1

#### *11.7.4 Police*

Phone: 9-1-1

### 11.7.5 Client

Contact: Keith Snavelly, Hydrogeologist w/NCDENR

Phone: (919) 508-8479

Contact: Miguel Alvalle, w/NCDENR

Phone: (704) 663-1699 x2191

### 11.7.6 Job Site

Contact: N/A

Phone: \_\_\_\_\_

## 11.8 National or Regional Sources of Assistance

- ◆ S&ME, Inc. Edmund Woloszyn 1-800-849-2517  
919-218-7790 (Mobile)
- ◆ EPA (RCRA – Superfund Hotline) 1-800-424-9346
- ◆ Chemtrec (24 hours) 1-800-424-9300
- ◆ Bureau of Explosives 1-202-293-4048
- ◆ Communicable Disease Center 1-404-663-5313
- ◆ National Response Center 1-800-424-8802
- ◆ DOT, Office of Hazardous Operations 1-202-426-0656
- ◆ U.S. Coast Guard (major incidents) 1-800-424-8802
- ◆ Pesticide Health Hotline 1-800-858-7378
- ◆ Medical Service Network 1-800-874-4676
- ◆ S&ME Corporate Health & Safety  
David Duke/Dan Caton 1-800-849-2517

**APPENDIX I**  
**MAPS**



**SCALE: 1" = ~127 ft.**

Base Map taken from 2010 Aerial Photograph from Cabarrus County GIS website

Scale: As Listed		<b>2010 Site Aerial</b>	<b>Figure</b>
Drawn by: RAS		Villa Mobile Home Park – Battery Casing Venice Street at Verona Street Kannapolis, North Carolina	
Checked by:		Job No.: 1054-11-2025	<b>1</b>
Date: 01-17-2012			

**APPENDIX II**  
**HEAT/COLD STRESS PROTOCOLS**

## **1. HEAT STRESS**

### **1.1 Introduction**

S&ME services performed in hot weather, such as drilling, construction services, asbestos management, hazardous waste site activities, and other field work, especially those that require wearing semi-permeable or impermeable protective clothing, are likely to cause heat stress. It is difficult to predict who will be affected and when, because individual susceptibility varies. In addition, environmental factors include more than the ambient air temperature. Radiant heat, air movement, conduction and relative humidity all affect the individual's response to heat.

### **1.2 Heat Stress Protocol**

Site-specific heat stress protocol shall be developed when S&ME employees are required to work in conditions that increase the risk of heat stress. These conditions include wearing semi-permeable or impermeable clothing when the work-site adjusted temperature exceeds 70°F, working at extreme metabolic loads (hard, heavy labor), etc. An example of heat stress protocol is included as Appendix G-1 of this section.

### **1.3 Training**

S&ME employees who are required to work in conditions that increase the risk of heat stress shall be trained on:

- Hazards of heat stress
- Recognition of cause, danger signs and symptoms
- First-aid procedures
- Employee responsibilities in avoiding heat stress
- Use of PPE and other equipment
- Dangers of using drugs and alcohol in heat stress conditions

### **1.4 Factors That Can Cause Heat Stress**

Factors that influence the body's tolerance to heat include:

- Clothing which decreases natural body ventilation
- Ambient temperatures of 70°F and above combined with the use of protective clothing
- Physical intolerance to heat conditions, (people who have had episodes of advanced heat stress or heat stroke tend to have an intolerance to heat)
- Poor physical conditioning
- Improper heat conditioning or acclimatization
- Excessive humidity conditions
- Some medications, alcohol and caffeinated drinks can cause the body to loose excess amounts of fluids
- Sex, (men usually have a higher tolerance to heat)
- Obesity
- Age, (younger people usually have a higher tolerance to heat than those over age 40)

### **1.5 Heat Stress Disorders**

#### **1.5.1 Heat Fatigue**

- Cause - Lack of acclimatization
- Signs and Symptoms - Impaired performance of skilled sensorimotor, mental or vigilance jobs

Treatment - None, except to remove the individual from the heat before a more serious heat-related condition develops

#### 1.5.2 Heat Rashes

- Cause - Skin that is persistently wetted by unevaporated sweat
- Signs and Symptoms - Usually appears as red papules (pimples) in areas where the clothing is restrictive
- Treatment - Remove individual from heat, apply medicated powder to affected area

#### 1.5.3 Heat Collapse

- Cause - Loss of oxygen to the brain because of blood pooling in the extremities
- Signs and Symptoms - Loss of consciousness
- Treatment - Remove individual from heat, give fluids

#### 1.5.4 Heat Cramps

Cause - Performing hard physical labor in a hot environment. These cramps are mostly caused by an electrolyte imbalance from sweating:

- Signs and Symptoms - Muscular cramps, usually in the stomach and legs
- Treatment - Remove the individual to a cool area and give fluids

#### 1.5.5 Heat Exhaustion

Cause - Increased stress on the heat regulating process of the body in an effort to meet the body's cooling demands.

**Signs and Symptoms** - Pale, clammy, moist skin, profuse sweating, headache, nausea, vertigo, weakness, thirst, and giddiness.

**Treatment** - Remove the individual to a cool area, loosen clothing, place in a head low position, give fluids, consult a physician.

#### 1.5.6 Heat Stroke

Cause - A combination of highly variable factors. Though difficult to predict, generally occurs when the body's system of temperature regulation fails, and the body's temperature rises to critical levels.

**Signs and Symptoms** - confusion, irrational behavior, loss of consciousness, convulsions, a lack of sweating, hot, dry skin, and abnormally high body temperature.

**Treatment** - **This is a medical emergency, obtain professional help immediately.** Place individual in cool area, remove outer clothing, wet skin and create air movement, transport immediately.

### 1.6 Heat Stress Management/Prevention

The effect of heat on the body may be managed or prevented by utilizing appropriate combinations of procedures such as:

### 1.6.1 Acclimatization

A properly designed and applied acclimatization program decreases the risk of heat-related illnesses. Such a program basically involves exposing employees to work in a hot environment for progressively longer periods. NIOSH (1986) recommends that, for workers who have had previous experience in jobs where heat levels are high enough to produce heat stress (drillers, helpers, field technicians, etc.), the regimen should be 50% exposure on day 1, 60% on day 2, 80% on day 3, and 100% on day 4. For new workers (new hires, geologists, engineers, office personnel, etc.), the regimen should be 20% day 1, with a 20% increase in exposure each day.

### 1.6.2 Fluid Replacement

Cool (50-60°F) water or any cool liquid (except alcohol) should be consumed at the rate of one cup every 20 minutes. Being thirsty is not a good indicator as to when fluids should be replaced.

### 1.6.3 Schedule Activities

Conduct non-emergency response activities in the early morning or evening hours during hot weather. Avoid heat-of-day work conditions whenever possible.

### 1.6.4 Increase Air Flow

As long as the air temperature is less than 95°F, increased air flow through the use of fans, etc., will help reduce heat stress. However, increases in air speed have no effect on the body temperatures of workers wearing vapor-barrier clothing.

### 1.6.5 Shields

Radiant heat can be reduced by the use of shields. For example a tarp could be used to shield employees from the sun or a piece of plywood could be used to shield an employee from hot exhaust from a piece of equipment.

### 1.6.6 Showers

Hose-down or mobile showers can be used to cool protective clothing and reduce body temperature.

### 1.6.7 Cool Vests

Commercially available ice or cool vests, may be used to help control body temperature. The cooling offered by ice packets lasts only two to four hours at moderate to heavy heat loads, making frequent replacement necessary. However, ice vests do not encumber the worker and thus permit maximum mobility.

### 1.6.8 Work/Rest Schedule Management

The following work/rest schedule should be used when temperatures exceed an adjusted temperature in excess of 70°F and Level B/C protection is required.

Adjusted Ambient Air Temperature °F	Active Work Time (min/hr) Using Level B/C Protect.
75 or less	50
80	40
85	30
90	20
95	10
100	0

Calculation for adjusted ambient air temperature

$$T(\text{adjusted}) = t(\text{actual}) + 13 \times \text{Fraction of sunshine}$$

Fraction of sunshine

100% sunshine = no cloud cover = 1.0

50% sunshine = 50% cloud cover = 0.5

0% sunshine = 100% cloud cover = 0.0

Actual temperature is the temperature in the work area measured with a standard thermometer.

## **1.7 Heat Stress Monitoring**

All employees who work in conditions that increase the risk of heat stress have the responsibility of personally monitoring themselves. Personal monitoring can be done by checking the heart rate, recovery heart rate, oral temperature, or extent of body water loss. Heart rate and oral temperature should be monitored at the beginning of each rest period, and body water loss should be measured at the beginning and end of each work day.

### *1.7.1 Heart Rate*

Count the radial pulse for 30 seconds at the beginning of the rest period, and multiply by 2 to get the heart rate per minute. The radial pulse can be found by exerting slight pressure on the thumb side of the wrist with the middle and ring fingers.

If the heart rate exceeds 110 beats per minute, shorten the next work period by one-third and maintain the same rest period

### *1.7.2 Oral Temperature*

Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

If the oral temperature exceeds 99.6°F shorten the next work cycle by one-third

If the oral temperature still exceeds 99.6°F at the beginning of the next rest period, shorten the following work cycle by one-third

In no case shall an employee be allowed to work in semipermeable or impermeable clothing when his/her oral temperature exceeds 100.6°F

### *1.7.3 Body Water Loss*

Measure weight on a scale at the beginning and end of each work day. Weights should be taken using the same scales while the employee wears the same or similar clothing. If the difference in beginning weight and ending weight is greater than 1.5% then not enough fluids were taken in during the day to replace the water loss through perspiration. Liquid intake should be increased the next day.

## **2. COLD STRESS**

### **2.1 Introduction**

Exposure to cold may cause severe injury to the surface of the body or result in profound generalized cooling which may lead to death. Cold stress can be divided into two specific conditions, frostbite and hypothermia. The conditions can occur singularly or simultaneously.

## 2.2 Cold Stress Protocol

Site-specific cold stress protocol shall be developed when S&ME employees are required to work in conditions that increase the risk of cold stress.

## 2.3 Cold Stress Training

S&ME employees who are required to work in conditions that increase the risk of cold stress shall be trained on:

- Hazards of cold stress
- Recognition of cause, danger signs and symptoms
- First-aid procedures
- Employee responsibilities in avoiding cold stress
- Use of PPE and other equipment
- Dangers of using drugs and alcohol in cold stress conditions

## 2.4 Factors That Can Cause Cold Stress

Factors that can lead to a cold related injury, and those that can increase the harmful effects of cold are:

- Ambient temperature

Wind velocity - Wind velocity added to the ambient temperature produces a chilling effect to the skin (wind chill) which can be much lower than the actual ambient temperature. As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph.

- Age - Very young and very old people normally have a lesser tolerance to cold
- Wet clothing - Water conducts heat 240 times faster than air. Thus, the body can cool very rapidly when clothing is wet
- Alcohol and certain medication
- Fatigue

## 2.5 Cold Stress Disorders

### 2.5.1 Hypothermia

Cause - Exposure of the body to temperatures which cause the body's temperature to drop. This can be caused by exposure to freezing or rapidly dropping temperatures, being submerged in water or wearing wet clothing for a sufficient length of time to cause the body's temperature to drop.

Signs and symptoms - Usually exhibited in 5 stages

- ✓ Uncontrollable shivering
- ✓ Apathy, listlessness, sleepiness
- ✓ Unconsciousness, glassy stare, slow pulse, and slow respiration rate
- ✓ Freezing of the extremities
- ✓ Death

Treatment - Move patient to a warm area, remove wet clothes, wrap in blankets, give warm fluids (only if conscious), apply warm cloths to areas where major blood vessels come close to the body surface (neck, underarms, front of elbow, behind knees, wrist, ankles).

### 2.5.2 Frostbite

Types - Local injury resulting from cold is included in the generic term frostbite. There are three degrees of frostbite which can be characterized as:

1. Frost nip or incipient frostbite - Characterized by sudden blanching or whitening of the skin.
2. Superficial frostbite - Characterized by skin with a waxy or white appearance which is firm to the touch; however, tissue beneath the skin surface is resilient.
3. Deep frostbite - Characterized by tissues that are cold, pale and solid.

- Cause - Exposure to freezing temperatures or touching objects whose temperatures are less than 32°F. Ice crystals form in the exposed body tissue (usually the nose, ears, chin, cheeks, fingers, or toes), restricting blood flow to these areas.

- Signs and symptoms - The first sign of frostbite may be tingling and redness, followed by paleness and numbness of the affected area. Developmental degrees include:

- ✓ The area becomes hot in sensation
- ✓ Blisters form
- ✓ Due to the lack of circulation, tissue death occurs and the effected area starts to decay (gangrene).

- Treatment - Move patient to warm area, place the injured part in warm (102°F to 105°F) water. After 30 minutes of warming the injured part, elevate the part if possible. If blisters form, do not allow them to become broken, wrap loosely in sterile wraps. Seek professional medical attention.

## 2.6 Cold Stress Management/Prevention

When field activities must be performed during times when ambient air temperatures are rapidly dropping or cold, with or without the wind chill factor, cold stress prevention procedures should be used. The effects of cold on the body may be managed or prevented by utilizing appropriate procedures and clothing:

### 2.6.1 Layered/loose/dry clothing

Loose layered clothing allows air pockets to form which are warmed by the body thus maintaining body warmth. The most effective mix is cotton or wool underneath, with something waterproof on top. If clothing gets wet, change immediately.

### 2.6.2 Head coverings

A hat is critical because you can lose up to 40% of your body temperature through your head.

### 2.6.3 Breaks

Plan for warming breaks in areas with heaters if possible. At a minimum, breaks should be in areas out of the wind.

### 2.6.4 Fluids

Maintain warm fluids (non-alcoholic) such as soup, cider, hot chocolate, etc. in the break area.



## HEAT STRESS MONITORING PROTOCOL (Example)

The drilling, well installation and sampling portion of the Brown's Neck chemical spill is scheduled to be done in August and September. It is expected that daily temperatures will range from 85°F to 97°F during this time period. The high temperatures combined with the fact that the work will be done in Level C protective clothing necessitate that personnel be monitored for heat stress.

This protocol will become effective when the adjusted ambient temperature exceeds 70°F, and will apply to all personnel using Level C protection. Those personnel using Level D protection shall comply with #1 of this protocol.

The effects of heat on the body will be managed by utilizing, at a minimum the following procedures:

1. All employees who are required to work on this site shall be trained on:

- Hazards of heat stress
- Recognition of cause, danger signs and symptoms
- First-aid procedures
- Employee responsibilities in avoiding heat stress
- Use of PPE and other equipment

This information shall be reviewed during the daily health and safety meetings.

2. Since the work is being done at the end of the summer the drill crews should be sufficiently acclimated to the heat. If personnel monitoring shows this not to be the case, then the individual(s) needing acclimatization will follow the same protocol as other site personnel. Other personnel on the site shall go through a 5 day acclimatization regimen. The regimen shall be 20% exposure the first day, with a 20% increase in exposure each day.
3. A water cooler will be located under a tarp shelter in the contamination reduction zone and in the support zone. Water breaks will be given every 20 minutes. A minimum of 8 oz. of liquid should be consumed by all personnel at each water break.
4. On days that are forecasted to be sunny with temperatures greater than 90°F, the work schedule shall be, 5:00am till 11:00am and 6:00pm until dark.
5. The following work/rest schedule shall be used.

Adjusted Ambient Air Temperature °F	Active Work Time (min/hr) Using Level B/C Protect.
75 or less	50
80	40
85	30
90	20
95	10
100	0

Calculation for adjusted ambient air temperature

$$T(\text{adjusted}) = t(\text{actual}) + 13 \times \text{Fraction of sunshine}$$

Fraction of sunshine

100% sunshine = no cloud cover = 1.0

50% sunshine = 50% cloud cover = 0.5

0% sunshine = 100% cloud cover = 0.0

Actual temperature is the temperature in the work area measured with a standard thermometer. Heat stress monitoring shall be done all site personnel affected by this protocol and shall follow these procedures:

A. Body water loss

A set of bathroom scales will be located at the command post. Prior to and after each work shift personnel shall weigh themselves. The weights shall be recorded in Attachment 1 of this protocol. Difference in weights greater than 1.5% are indicative of insufficient fluid replacement. Close attention will be paid during the next work cycle to the fluid replacement of individuals whose weight loss exceeded 1.5%. If weight lost in any individual exceeds 1.5% two days in a row, the individual will not be allowed to work in Level C for a minimum of 48 hrs.

B. Body temperature measurement

Oral body temperature measurements, using a clinical thermometer (3 minutes under the tongue) shall be taken at the beginning of every break period, prior to drinking any fluid. Temperatures shall be recorded on Attachment 1 of this protocol.

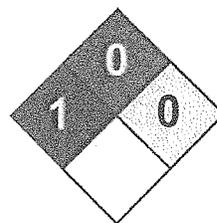
- If the oral temperature exceeds 99.6°F the next work cycle shall be shortened by one-third
- If the oral temperature still exceeds 99.6°F at the beginning of the next rest period, the following work cycle shall be shortened by one-third
- In no case shall an employee be allowed to work in semipermeable or impermeable clothing when his/her oral temperature exceeds 100.6°F

C. Heart rate evaluation

Count the radial pulse for 30 seconds at the beginning of the rest period, and multiply by 2 to get the heart rate per minute. The radial pulse can be found by exerting slight pressure on the thumb side of the wrist with the middle and ring fingers. Heart rates shall be recorded on Attachment 1 of this protocol.

- If the heart rate exceeds 110 beats per minute, shorten the next work period by one-third and maintain the same rest period

**APPENDIX III**  
**MATERIAL SAFETY DATA SHEETS**



## Material Safety Data Sheet Lead MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Lead

**Catalog Codes:** SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

**CAS#:** 7439-92-1

**RTECS:** OF7525000

**TSCA:** TSCA 8(b) inventory: Lead

**CI#:** Not available.

**Synonym:** Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

**Chemical Name:** Lead

**Chemical Formula:** Pb

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

**CHEMTREC (24HR Emergency Telephone), call:**  
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Lead	7439-92-1	100

**Toxicological Data on Ingredients:** Lead LD50: Not available. LC50: Not available.

### Section 3: Hazards Identification

**Potential Acute Health Effects:** Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

**Potential Chronic Health Effects:**

Slightly hazardous in case of skin contact (permeator). **CARCINOGENIC EFFECTS:** Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance may be toxic to blood, kidneys, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

**Skin Contact:** Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

**Serious Skin Contact:** Not available.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

### Section 5: Fire and Explosion Data

**Flammability of the Product:** May be combustible at high temperature.

**Auto-Ignition Temperature:** Not available.

**Flash Points:** Not available.

**Flammable Limits:** Not available.

**Products of Combustion:** Some metallic oxides.

**Fire Hazards in Presence of Various Substances:** Non-flammable in presence of open flames and sparks, of shocks, of heat.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

**Special Remarks on Fire Hazards:** When heated to decomposition it emits highly toxic fumes of lead.

**Special Remarks on Explosion Hazards:** Not available.

### Section 6: Accidental Release Measures

**Small Spill:**

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

### Section 7: Handling and Storage

**Precautions:**

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable

protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection:** Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 0.05 (mg/m<sup>3</sup>) from ACGIH (TLV) [United States] TWA: 0.05 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] TWA: 0.03 (mg/m<sup>3</sup>) from NIOSH [United States] TWA: 0.05 (mg/m<sup>3</sup>) [Canada] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid. (Metal solid.)

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 207.21 g/mole

**Color:** Bluish-white. Silvery. Gray

**pH (1% soln/water):** Not applicable.

**Boiling Point:** 1740°C (3164°F)

**Melting Point:** 327.43°C (621.4°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 11.3 (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** Not available.

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:** Insoluble in cold water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials, excess heat

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Can react vigorously with oxidizing materials. Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

### Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Inhalation. Ingestion.

**Toxicity to Animals:**

LD50: Not available. LC50: Not available.

**Chronic Effects on Humans:**

**CARCINOGENIC EFFECTS:** Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

**Other Toxic Effects on Humans:** Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:**

**Acute Potential:** Skin: Lead metal granules or dust: May cause skin irritation by mechanical action. Lead metal foil, shot or sheets: Not likely to cause skin irritation. Eyes: Lead metal granules or dust: Can irritate eyes by mechanical action. Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation. Inhalation: In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes. Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungs by mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually absorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, delirium, convulsions/seizures, coma, and death. Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count. Ingestion: Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead colic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases. Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

### Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

**Section 13: Disposal Considerations****Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

**Section 14: Transport Information**

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

**Section 15: Other Regulatory Information****Federal and State Regulations:**

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Lead California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead Connecticut hazardous material survey.: Lead Illinois toxic substances disclosure to employee act: Lead Illinois chemical safety act: Lead New York release reporting list: Lead Rhode Island RTK hazardous substances: Lead Pennsylvania RTK: Lead

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):** CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):**

R20/22- Harmful by inhalation and if swallowed. R33- Danger of cumulative effects. R61- May cause harm to the unborn child. R62- Possible risk of impaired fertility. S36/37- Wear suitable protective clothing and gloves. S44- If you feel unwell, seek medical advice (show the label when possible). S53- Avoid exposure - obtain special instructions before use.

**HMIS (U.S.A.):**

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

**National Fire Protection Association (U.S.A.):**

Health: 1

**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

**Section 16: Other Information**

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:21 PM

**Last Updated:** 11/01/2010 12:00 PM

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.*

**APPENDIX IV**  
**CERTIFICATION OF SITE PERSONNEL**

# Certificate of Completion

*This certifies that*

**Roger Smith**

Has Successfully completed

## 8 Hour HAZWOPER Refresher Training

Refresher certification does not necessarily indicate initial 24 or 40 Hour HAZWOPER certification

In Accordance W/Federal OSHA Regulation 29 CFR 1910.120(e), (p) & (q)

And all State OSHA and EPA Regulations As Well

*Julius P. Griggs*

Julius P. Griggs  
Instructor #892

110324544255

Certificate Number

3/24/2011

Issue Date



**UNLIMITED, Inc.**

OSHA Compliant Safety Training Since 1993

690A East Los Angeles Ave Suite 180 Simi Valley, CA 93065  
888-309-7233 \* 805-306-8027 \* 866-869-7097 (F)  
[www.safetyunlimited.com](http://www.safetyunlimited.com)

Proof of initial certification and subsequent refresher training is NOT required to take refresher training  
Want to be sure this certificate is valid? Visit [safetyunlimited.com/verification](http://safetyunlimited.com/verification)

# Certificate of Completion

*This certifies that*

**Curtis Helms, Jr.**

Has Successfully completed

## 8 Hour HAZWOPER Refresher Training

Refresher certification does not necessarily indicate initial 24 or 40 Hour HAZWOPER certification

**In Accordance With Federal OSHA Regulation 29 CFR 1910.120(e)**

And all State OSHA and EPA Regulations As Well

*Julius P. Griggs*

Julius P. Griggs  
Instructor #892

100407529634

Certificate Number

4/7/2010

Issue Date



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**APPENDIX V**  
**SAFETY MEETINGS**





**APPENDIX VI**  
**PERSONNEL SITE ACTIVITY LOG**



**APPENDIX VII  
MEDICAL SURVEILLANCE AND  
TRAINING STATUS OF SITE PERSONNEL**

**APPENDIX VIII**  
**AMENDMENTS TO THE HEALTH AND SAFETY PLAN**

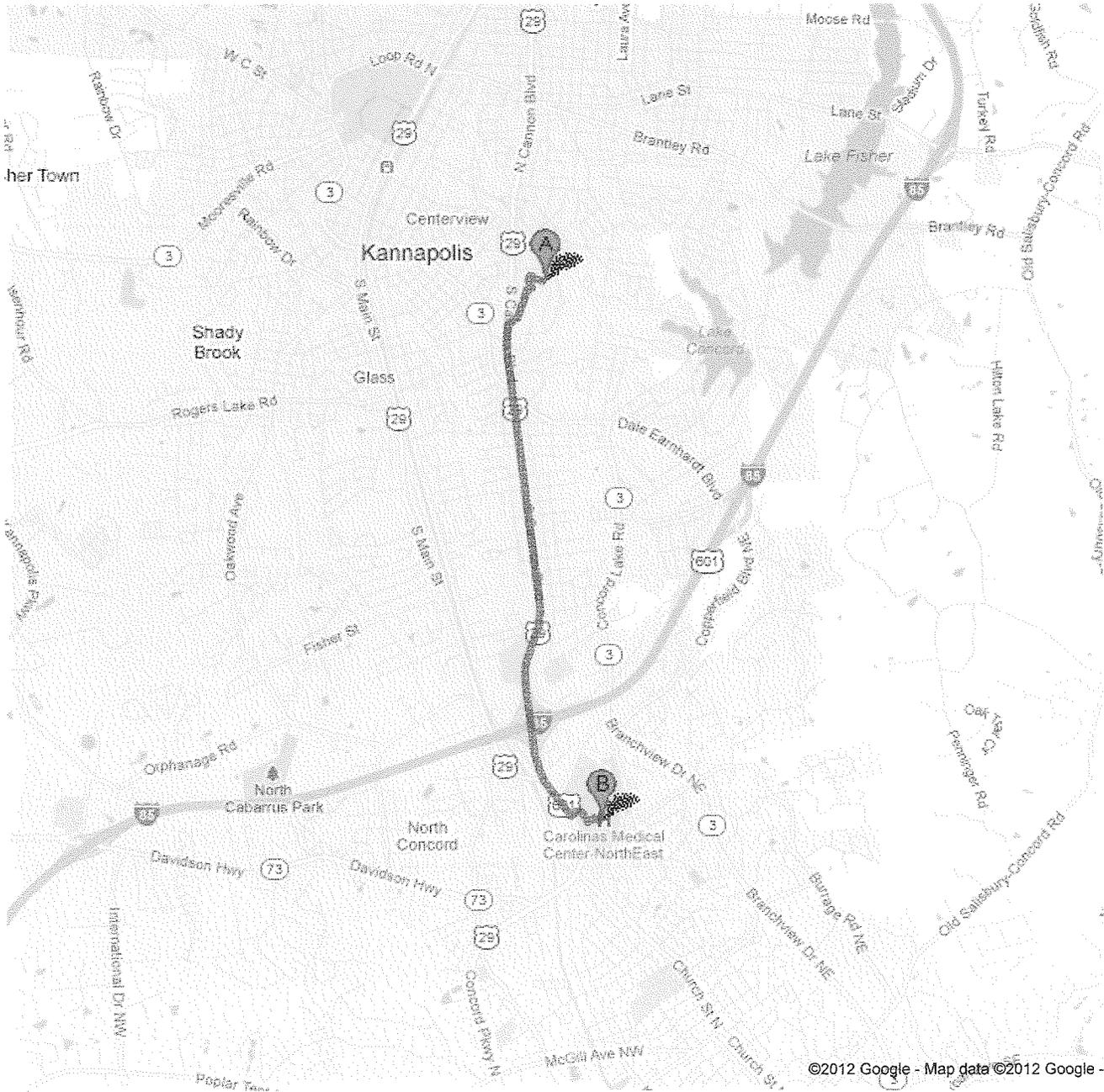
**APPENDIX IX  
DIRECTIONS AND MAP TO HOSPITAL**



**Directions to Carolinas Medical Center-NorthEast**

920 Church Street North, Concord, NC 28025 - (704) 403-3000

**3.8 mi – about 9 mins**



 612 Venice St, Kannapolis, NC 28083

- 1. Head west on **Verona St** toward **Messina Ct** go 0.2 mi  
total 0.2 mi
-  2. Turn right onto **Irene Ave** go 0.3 mi  
total 0.4 mi  
About 1 min
-  3. Turn left onto **S Cannon Blvd** go 2.5 mi  
total 3.0 mi  
About 4 mins
-  4. Continue onto **Concord Pkwy N** go 0.6 mi  
total 3.6 mi  
About 1 min
-  5. Turn left onto **Mall Dr NE** go 236 ft  
total 3.6 mi  
About 1 min
-  6. Slight right onto **Medical Park Dr NE** go 0.1 mi  
total 3.8 mi
-  7. Turn left to stay on **Medical Park Dr NE** go 272 ft  
total 3.8 mi
-  8. Take the 1st right onto **Hospital St NE** go 187 ft  
total 3.8 mi

 **Carolinas Medical Center-NorthEast**  
920 Church Street North, Concord, NC 28025 - (704) 403-3000

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2012 Google

Directions weren't right? Please find your route on [maps.google.com](http://maps.google.com) and click "Report a problem" at the bottom left.

## **APPENDIX IV**

### **GEOPHYSICAL DATA AND FIGURES**



**REFERENCE:**

- Google Earth Aerial Photograph
- Dated April 10, 2010

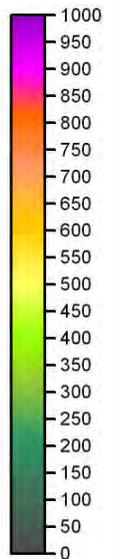
**LEGEND**

 TDEM Path

SCALE: NTS		<b>TDEM TEST LOCATION PLAN</b> Villa Mobile Home Park – Battery Casing Venice Street at Verona Street, Kannapolis, North Carolina	FIGURE NO.	
DRAWN BY: KDH			1	
CHECKED BY: DDB			JOB NO.: 1054-11-2025	
DATE: 2-1-12				



Conductivity (mV)



**REFERENCE:**

- Google Earth Aerial Photograph
- Dated July 5, 2010

SCALE: NTS
DRAWN BY: KDH
CHECKED BY: DDB
DATE: 2-1-12



<p><b>TDEM DATA PLOT</b> <b>Villa Mobile Home Park – Battery Casing</b> Venice Street at Verona Street, Kannapolis, North Carolina</p>	FIGURE NO. <b>2</b>
JOB NO.: 1054-11-2025	



**REFERENCE:**

- Google Earth Aerial Photograph
- Dated July 5, 2010

**LEGEND**

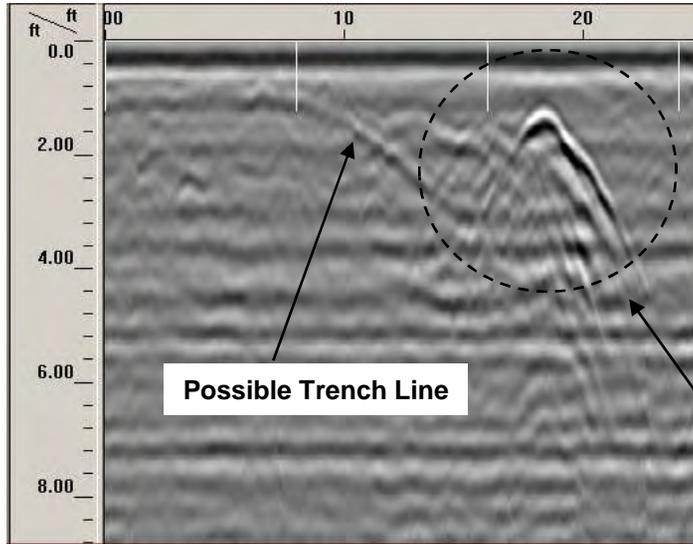
-  GPR Line
-  TDEM Anomaly
-  TDEM Anomaly Designation

SCALE: NTS
DRAWN BY: KDH
CHECKED BY: DDB
DATE: 2-1-12

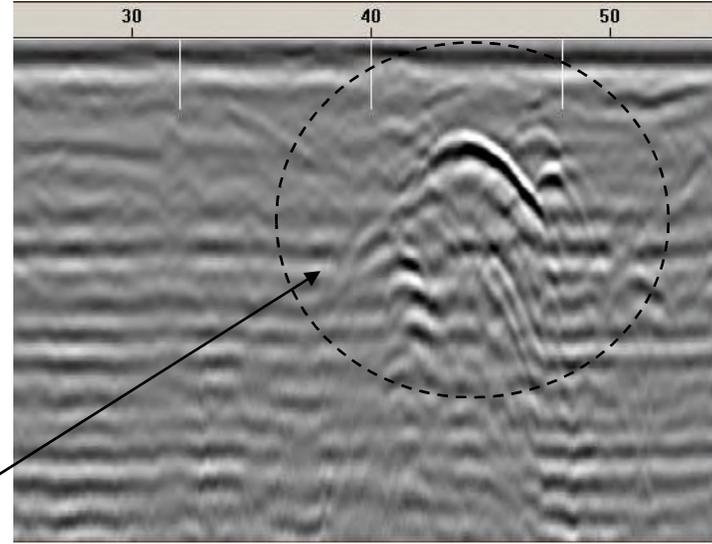


<p align="center"><b>GPR TEST LOCATION PLAN</b> Villa Mobile Home Park – Battery Casing Venice Street at Verona Street, Kannapolis, North Carolina</p>	FIGURE NO.  <b>3</b>
JOB NO.: 1054-11-2025	

Anomaly 1; Line 1

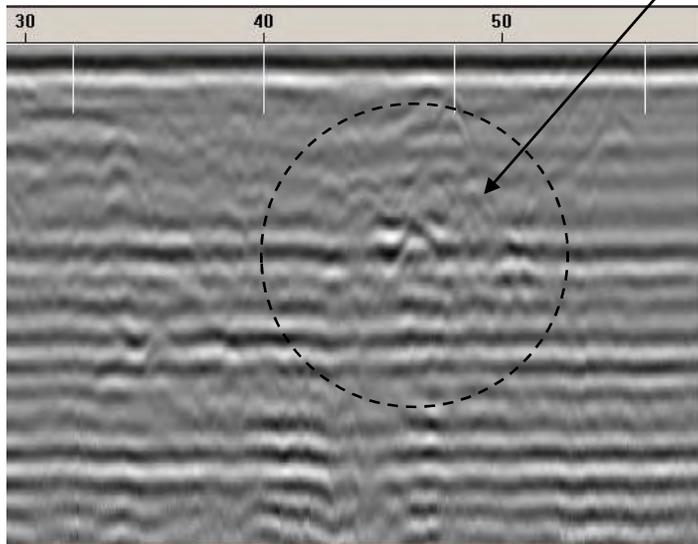


Anomaly 1: Line 2

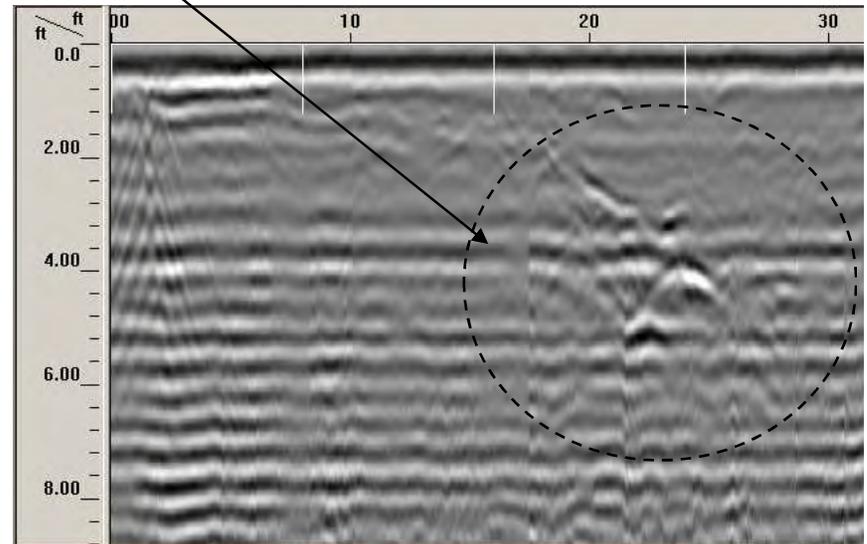


Anomaly

Anomaly 2: Line 6



Anomaly 3: Line 10



SCALE: NTS
DRAWN BY: KDH
CHECKED BY: DDB
DATE: 2-1-12



<b>EXAMPLE GPR PROFILES</b> Villa Mobile Home Park – Battery Casing Venice Street at Verona Street, Kannapolis, North Carolina	FIGURE NO.  <b>4</b>
JOB NO.: 1054-11-2025	

## **APPENDIX V**

### **SUMMARY OF TEST PIT FINDINGS AND OBSERVATIONS**

**SUMMARY OF TEST PIT EXCAVATIONS  
VILLA MOBILE HOME PARK  
BATTERY CASING DUMP SITE  
KANNAPOILIS, CABARRUS COUNTY, NC  
MARCH 6, 2012**

**Test Pit 1**

Dimensions: (4 ft. L x 2 ft. W x 5 ft. D)

Content: 0'-2' ft: Red brown clay  
2'-4' Lt. tan to white sandy material with battery casings  
Rail road ties in bottom of excavation with transition to clay silt in  
bottom of excavation

**Test Pit 2**

Dimensions: (6 ft. L x 2 ft. W x 7 ft. D)

Content: 0'-2' ft: Red to Dk. brown sandy clay  
2'-7' coarse sand with evidence of battery casings  
Groundwater encountered at approximately 6' bls.

**Test Pit 3**

Dimensions: (4 ft. L x 2 ft. W x 4 ft. D)

Content: 0'-2.5' Lt. brown sandy clay with battery casing (0.5-2.5)  
2'-4' red-brown clay with no evidence of battery casings

**Test Pit 4**

Dimensions: (3 ft. L x 1 ft. W x 4 ft. D)

Content: 0'-5' Dk. brown to Lt. brown sandy clay with no battery casing

**Test Pit 5**

Dimensions: (3 ft. L x 1 ft. W x 7 ft. D)

Content: 0'-2' Red-Brown sandy clay with no battery casing  
2'-6.5' Lt. Brown to tan sandy silt  
6.5'-7' Lt. to Dk. brown clay silt (no evidence of battery casings)

**Test Pit 6**

Dimensions: (3 ft. L x 1 ft. W x 4 ft. D)

Content: 0'-4' Dk brown clay silt (no evidence of battery casing)  
Casings may be greater than the limit of the mini-excavator

### **Test Pit 7**

Dimensions: (6 ft. L x 1 ft. W x 6 ft. D)

Content: 0'-2' Red-brown clay silt (no evidence of battery casing)  
2'-5' brown sandy clay with battery casings  
5'-6' brown sand (no battery casings)

### **Test Pit 8**

Dimensions: (6 ft. L x 1 ft. W x 6 ft. D)

Content: 0'-2' Lt to Dk. brown sand (fine)  
2'-2.5' Black sandy clay with lots of organic matter  
3'-6' Black clay with organic matter and casings

### **Test Pit 9**

Dimensions: (2 ft. L x 1 ft. W x 4 ft. D)

Content: 0'-1' Lt brown sandy clay (no casings)  
1'-4' red brown clay silt (no casings)

**APPENDIX VI**

**REPORT OF LABORATORY ANALYSIS AND  
CHAIN OF CUSTODY RECORD**



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(704)875-9092

March 14, 2012

Ed Woloszyn  
S&ME  
3201 Spring Forest Road  
Raleigh, NC 27616

RE: Project: VILLA MOBILE HOME PARK  
Pace Project No.: 92113615

Dear Ed Woloszyn:

Enclosed are the analytical results for sample(s) received by the laboratory on March 07, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Herring

kevin.herring@pacelabs.com  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: VILLA MOBILE HOME PARK  
Pace Project No.: 92113615

### Asheville Certification IDs

2225 Riverside Dr., Asheville, NC 28804  
Florida/NELAP Certification #: E87648  
Massachusetts Certification #: M-NC030  
North Carolina Drinking Water Certification #: 37712  
North Carolina Wastewater Certification #: 40

South Carolina Certification #: 99030001  
Virginia Certification #: 00072  
West Virginia Certification #: 356  
Virginia/VELAP Certification #: 460147

---

## REPORT OF LABORATORY ANALYSIS



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### SAMPLE SUMMARY

Project: VILLA MOBILE HOME PARK  
Pace Project No.: 92113615

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92113615001	COMPOSITE ROLL - OFF	Solid	03/04/12 16:00	03/07/12 16:30

### REPORT OF LABORATORY ANALYSIS



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### SAMPLE ANALYTE COUNT

Project: VILLA MOBILE HOME PARK  
Pace Project No.: 92113615

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92113615001	COMPOSITE ROLL - OFF	EPA 6010	JMW	7	PASI-A
		EPA 7470	DMB	1	PASI-A

### REPORT OF LABORATORY ANALYSIS

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### HITS ONLY

Project: VILLA MOBILE HOME PARK  
Pace Project No.: 92113615

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>92113615001</b>	<b>COMPOSITE ROLL - OFF</b>					
EPA 6010	Barium	0.54	mg/L	0.50	03/13/12 01:56	
EPA 6010	Cadmium	<0.0050	mg/L	0.0050	03/13/12 01:56	
EPA 6010	Lead	195	mg/L	0.50	03/13/12 12:51	

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### ANALYTICAL RESULTS

Project: VILLA MOBILE HOME PARK  
 Pace Project No.: 92113615

Sample: COMPOSITE ROLL - OFF Lab ID: 92113615001 Collected: 03/04/12 16:00 Received: 03/07/12 16:30 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP, TCLP</b>									
Analytical Method: EPA 6010 Preparation Method: EPA 3010									
Leachate Method/Date: EPA 1311; 03/09/12 17:40									
Arsenic	<0.025	mg/L	0.025	0.014	1	03/12/12 11:05	03/13/12 01:56	7440-38-2	
Barium	0.54	mg/L	0.50	0.0010	1	03/12/12 11:05	03/13/12 01:56	7440-39-3	
Cadmium	<0.0050	mg/L	0.0050	0.0025	1	03/12/12 11:05	03/13/12 01:56	7440-43-9	
Chromium	<0.025	mg/L	0.025	0.0020	1	03/12/12 11:05	03/13/12 01:56	7440-47-3	
Lead	195	mg/L	0.50	0.40	20	03/12/12 11:05	03/13/12 12:51	7439-92-1	
Selenium	<0.10	mg/L	0.10	0.019	1	03/12/12 11:05	03/13/12 01:56	7782-49-2	
Silver	<0.025	mg/L	0.025	0.00050	1	03/12/12 11:05	03/13/12 01:56	7440-22-4	
<b>7470 Mercury, TCLP</b>									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Leachate Method/Date: EPA 1311; 03/09/12 17:40									
Mercury	<0.20	ug/L	0.20	0.090	1	03/12/12 12:30	03/13/12 13:41	7439-97-6	



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### QUALITY CONTROL DATA

Project: VILLA MOBILE HOME PARK  
 Pace Project No.: 92113615

QC Batch: MERP/4100 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury TCLP  
 Associated Lab Samples: 92113615001

METHOD BLANK: 733640 Matrix: Water  
 Associated Lab Samples: 92113615001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.20	0.20	03/13/12 13:27	

LABORATORY CONTROL SAMPLE: 733641

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.9	117	80-120	

MATRIX SPIKE SAMPLE: 733643

Parameter	Units	92113427001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	ND	2.5	2.5	95	75-125	

SAMPLE DUPLICATE: 733642

Parameter	Units	92113753001 Result	Dup Result	RPD	Max RPD	Qualifiers
Mercury	ug/L	ND	<0.20		20	



**QUALITY CONTROL DATA**

Project: VILLA MOBILE HOME PARK  
 Pace Project No.: 92113615

QC Batch: MPRP/10074 Analysis Method: EPA 6010  
 QC Batch Method: EPA 3010 Analysis Description: 6010 MET TCLP  
 Associated Lab Samples: 92113615001

METHOD BLANK: 733605 Matrix: Water  
 Associated Lab Samples: 92113615001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/L	<0.025	0.025	03/13/12 01:18	
Barium	mg/L	<0.50	0.50	03/13/12 01:18	
Cadmium	mg/L	<0.0050	0.0050	03/13/12 01:18	
Chromium	mg/L	<0.025	0.025	03/13/12 01:18	
Lead	mg/L	<0.025	0.025	03/13/12 01:18	
Selenium	mg/L	<0.10	0.10	03/13/12 01:18	
Silver	mg/L	<0.025	0.025	03/13/12 01:18	

LABORATORY CONTROL SAMPLE: 733606

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	2.5	2.7	106	80-120	
Barium	mg/L	2.5	2.3	93	80-120	
Cadmium	mg/L	2.5	2.4	97	80-120	
Chromium	mg/L	2.5	2.5	98	80-120	
Lead	mg/L	2.5	2.3	91	80-120	
Selenium	mg/L	2.5	2.7	109	80-120	
Silver	mg/L	1.2	1.3	104	80-120	

MATRIX SPIKE SAMPLE: 733608

Parameter	Units	92113427001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	ND	2.5	2.8	110	75-125	
Barium	mg/L	ND	2.5	2.8	95	75-125	
Cadmium	mg/L	ND	2.5	2.5	100	75-125	
Chromium	mg/L	0.039	2.5	2.6	101	75-125	
Lead	mg/L	11.6	2.5	13.2	67	75-125 M1	
Selenium	mg/L	ND	2.5	2.8	113	75-125	
Silver	mg/L	ND	1.2	1.3	107	75-125	

SAMPLE DUPLICATE: 733607

Parameter	Units	92113753001 Result	Dup Result	RPD	Max RPD	Qualifiers
Arsenic	mg/L	ND	<0.025		20	
Barium	mg/L	ND	<0.50		20	
Cadmium	mg/L	ND	<0.0050		20	
Chromium	mg/L	ND	<0.025		20	
Lead	mg/L	ND	<0.025		20	



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### QUALITY CONTROL DATA

Project: VILLA MOBILE HOME PARK  
Pace Project No.: 92113615

SAMPLE DUPLICATE: 733607

Parameter	Units	92113753001 Result	Dup Result	RPD	Max RPD	Qualifiers
Selenium	mg/L	ND	<0.10		20	
Silver	mg/L	ND	<0.025		20	



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## QUALIFIERS

Project: VILLA MOBILE HOME PARK  
Pace Project No.: 92113615

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Acid preservation may not be appropriate for 2-Chloroethylvinyl ether, Styrene, and Vinyl chloride.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-A Pace Analytical Services - Asheville

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.



Pace Analytical Services, Inc.  
205 East Meadow Road - Suite A  
Eden, NC 27288  
(336)623-8921

Pace Analytical Services, Inc.  
2225 Riverside Dr.  
Asheville, NC 28804  
(828)254-7176

Pace Analytical Services, Inc.  
9800 Kinsey Ave. Suite 100  
Huntersville, NC 28078  
(704)875-9092

### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: VILLA MOBILE HOME PARK  
Pace Project No.: 92113615

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92113615001	COMPOSITE ROLL - OFF	EPA 3010	MPRP/10074	EPA 6010	ICP/9274
92113615001	COMPOSITE ROLL - OFF	EPA 7470	MERP/4100	EPA 7470	MERC/4024





Document Name:  
**Sample Condition Upon Receipt (SCUR)**

Document Revised: January 30, 2012  
Page 1 of 2

Document Number:  
**F-CHR-CS-03-rev.06**

Issuing Authority:  
Pace Huntersville Quality Office

Client Name: Stm Project # 92113615

Where Received:  Huntersville  Asheville  Eden

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Packing Material:  Bubble Wrap  Bubble Bags  None  Other \_\_\_\_\_

Thermometer Used: IR Gun T1101 T1102 Type of Ice: Wet Blue None  Samples on ice, cooling process has begun

Temp Correction Factor T1101: No Correction T1102: Subtract 1.2°C

Corrected Cooler Temp.: 3.3 C Biological Tissue is Frozen: Yes No N/A  
Temp should be above freezing to 6°C

Date and Initials of person examining contents: mmmm 3/7/12

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>SC</u>		
All containers needing preservation have been checked.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

SCURF Review: BICAM Date: 3/7/12 SRF Review: KCH Date: 3/8/12

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

**APPENDIX VII**

**MITIGATION OPTIONS COST DETAILS**

**Option 1A**  
**Villa Mobile Home Park**  
**612 Venice street**  
**Kannapolis, Cabarrus Co., North Carolina**  
**S&ME Project No. 1054-11-2025**

**Description for Mitigation Option 1A (Hazardous):**

Services include but are not limited to Site-Specific Health and Safety Plan (HASP); obtain necessary permits; installing safety fencing around work zone; installing necessary erosion control measures; removal/disposal of mobile home trailers (if necessary); removal and disposal of concrete and asphalt paving, and upstream concrete headwall; removal of approximately 100 feet of upstream UST culvert; widening stream channel (for open channel design) and stabilizing stream bank; excavation and stockpiling of overburden; excavating battery casing/soil and load into roll-off boxes for immediate transportation and disposal (hazardous); import/place backfill material; restore work area and stream channel; seed and straw area.

Description	Units	Rate (EVO)	Mark-up	Rates w/ 15%	Cost
<b>1. Project Coordination and Health &amp; Safety Plan</b>					
Senior Professional	10 Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Manager	8 Hour	@ \$ 95.00	\$ -	\$ -	\$ 760.00
Staff Professional	6 Hour	@ \$ 85.00	\$ -	\$ -	\$ 510.00
Secretary	4 Hour	@ \$ 42.50	\$ -	\$ -	\$ 170.00
			\$ -	\$ -	
					<b>\$ 2,450.00</b>
<b>2. Subcontractors</b>					
<b>2.1 Demolition</b>					
Installation of security fencing	1,000 ft	@ \$ 4.50	\$ 1.15	\$ 5.18	\$ 5,175.00
Mobilization of Equipment	1 each	@ \$ 800.00	\$ 1.15	\$ 920.00	\$ 920.00
Trachoe w/ Operator	45 days	@ \$ 1,095.00	\$ 1.15	\$ 1,259.25	\$ 56,666.25
Backhoe w/ Operator	45 days	@ \$ 695.00	\$ 1.15	\$ 799.25	\$ 35,966.25
Transportation/Disposal of Asphalt	3 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 672.75
Transportation/Disposal of Concrete	5 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 1,121.25
Transportation/Disposal of UST Culvert	7 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 1,569.75
Demolition and disposal of mobile home trailers	2 each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ 5,750.00
					<b>\$ 107,841.25</b>
<b>2.2 Excavation Activities</b>					
All applicable Permits (if required)	1 each	@ \$ 1,000.00	\$ 1.15	\$ 1,150.00	\$ 1,150.00
Roll-off Spot Fee (2-boxes with bows and tarp)	14 trip	@ \$ 300.00	\$ 1.15	\$ 345.00	\$ 4,830.00
Roll-off Liner	19 each	@ \$ 65.00	\$ 1.15	\$ 74.75	\$ 1,420.25
Roll-off Rental (19 boxes for 5-day transportation to facility)	98 day	@ \$ 15.00	\$ 1.15	\$ 17.25	\$ 1,690.50
Soil Excavation and Stockpiling (clean overburden)	240 yds <sup>3</sup>	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 2,622.00
Mobilization of Screener	0 each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ -
Screener Rental	0 mo	@ \$ 13,000.00	\$ 1.15	\$ 14,950.00	\$ -
On-site Chemical Stabilization	0 tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ -
Loading Material into Soil Screener	0 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ -
Loading Soil into Roll-off Boxes	0 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ -
Loading Battery Casings into Roll-off Boxes	0 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ -
Transportation/Disposal (soil only) as Non-Hazardous	0 tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ -
Approval Fees (Soil/Battery Casings)	1 each	@ \$ 295.00	\$ 1.15	\$ 339.25	\$ 339.25
Transportation (Battery Casings/Soil) as Hazardous	19 loads	@ \$ 3,575.00	\$ 1.15	\$ 4,111.25	\$ 78,113.75
Disposal (Battery Casings/Soil) as Hazardous	376 yds <sup>3</sup>	@ \$ 390.00	\$ 1.15	\$ 448.50	\$ 168,636.00
Erosion Control	1 each	@ \$ 10,000.00	\$ 1.15	\$ 11,500.00	\$ 11,500.00
					<b>\$ 270,301.75</b>
<b>2.3 Site Restoration</b>					
Backfill Placement (Clean Overburden)	361 tons	@ \$ 9.05	\$ 1.15	\$ 10.41	\$ 3,757.11
Backfill Supply and Placement	570 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 6,227.25
Restoration of Stream bank (Excelsior Matting)	250 yds <sup>2</sup>	@ \$ 0.55	\$ 1.15	\$ 0.63	\$ 158.13
Grass Seed	3 bags	@ \$ 95.00	\$ 1.15	\$ 109.25	\$ 327.75
Straw bails	20 bail	@ \$ 5.50	\$ 1.15	\$ 6.33	\$ 126.50
					<b>\$ 10,596.73</b>
<b>3. S&amp;ME Field Activities</b>					
Senior Professional	10 Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Professional	25 Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	50 Hour	@ \$ 85.00	\$ -	\$ -	\$ 4,250.00
Environmental Technician	100 Hour	@ \$ 65.00	\$ -	\$ -	\$ 6,500.00
Field equipment and misc. supplies (gps/dust/gloves)	1 ea	@ \$ 1,000.00	\$ -	\$ -	\$ 1,000.00
					<b>\$ 15,135.00</b>
<b>4. Project Management &amp; Reporting</b>					
Senior Professional	32 Hour	@ \$ 101.00	\$ -	\$ -	\$ 3,232.00
Project Professional	25 Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	45 Hour	@ \$ 85.00	\$ -	\$ -	\$ 3,825.00
CAD Professional	15 Hour	@ \$ 58.00	\$ -	\$ -	\$ 870.00
Secretary	5 Hour	@ \$ 42.50	\$ -	\$ -	\$ 212.50
					<b>\$ 10,514.50</b>

<b>SUBTOTAL ESTIMATE:</b>	<b>\$ 416,839.23</b>
<b>20 % Contingency:</b>	<b>\$ 83,367.85</b>
<b>TOTAL ESTIMATE:</b>	<b>\$ 500,207.08</b>

**Option 1B**  
**Villa Mobile Home Park**  
**612 Venice street**  
**Kannapolis, Cabarrus Co., North Carolina**  
**S&ME Project No. 1054-11-2025**

**Description for Mitigation Option 1B (Non-Hazardous):**

Services include but are not limited to Site-Specific Health and Safety Plan (HASP); obtain necessary permits; installing safety fencing around work area; installing necessary erosion control measures; removal/disposal of mobile home trailers (if necessary); removal and disposal of concrete paving, asphalt paving, and upstream concrete headwall; excavation and scraping of approximately 100 feet of upstream UST culvert; widening stream channel (for open channel design) and stabilizing stream bank; excavation and stockpiling of overburden; excavating battery casing/soil and loading into screener; chemically stabilizing soil; collect a composite soil sample for laboratory analysis (TCLP-Lead); load segregated soil into roll-off boxes for transportation (non-hazardous); load battery casings/soil into roll-off boxes for transportation (hazardous); import/place backfill material; restore work area and stream channel; seed and straw area.

Description	Units		Rate (EVO)	Mark-up	Rates w/ 15%	Cost
<b>1. Project Coordination and Health &amp; Safety Plan</b>						
Senior Professional	10	Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Manager	8	Hour	@ \$ 95.00	\$ -	\$ -	\$ 760.00
Staff Professional	6	Hour	@ \$ 85.00	\$ -	\$ -	\$ 510.00
Secretary	4	Hour	@ \$ 42.50	\$ -	\$ -	\$ 170.00
<b>SUBTOTAL:</b>						<b>\$ 2,450.00</b>
<b>2. Subcontractors</b>						
<b>2.1 Demolition</b>						
Installation of security fencing	1,000	ft	@ \$ 4.50	\$ 1.15	\$ 5.18	\$ 5,175.00
Mobilization of Equipment	1	each	@ \$ 800.00	\$ 1.15	\$ 920.00	\$ 920.00
Trachoe w/ Operator	60	days	@ \$ 1,095.00	\$ 1.15	\$ 1,259.25	\$ 75,555.00
Backhoe w/ Operator	60	days	@ \$ 695.00	\$ 1.15	\$ 799.25	\$ 47,955.00
Transportation/Disposal of Asphalt	3	loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 672.75
Transportation/Disposal of Concrete	5	loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 1,121.25
Transportation/Disposal of UST Culvert	7	loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 1,569.75
Demolition and disposal of mobile home trailers	4	each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ 11,500.00
<b>SUBTOTAL:</b>						<b>\$ 144,468.75</b>
<b>2.2 Excavation Activities</b>						
All applicable Permits (if required)	1	each	@ \$ 1,000.00	\$ 1.15	\$ 1,150.00	\$ 1,150.00
Roll-off Spot Fee (2-boxes with bows and tarp)	14	trip	@ \$ 300.00	\$ 1.15	\$ 345.00	\$ 4,830.00
Roll-off Liner	28	each	@ \$ 65.00	\$ 1.15	\$ 74.75	\$ 2,093.00
Roll-off Rental (28 boxes for 2 weeks each)	392	day	@ \$ 15.00	\$ 1.15	\$ 17.25	\$ 6,762.00
Soil Excavation and Stockpiling (clean overburden)	240	yds <sup>3</sup>	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 2,622.00
Mobilization of Screener	1	each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ 2,875.00
Screener Rental	2	mo	@ \$ 13,000.00	\$ 1.15	\$ 14,950.00	\$ 29,900.00
On-site Chemical Stabilization	216	tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ 30,553.20
Loading Material into Soil Screener	570	tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 6,227.25
Loading Soil into Roll-off Boxes	228	tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 2,490.90
Loading Battery Casings into Roll-off Boxes	342	tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 3,736.35
Transportation/Disposal (soil only) as Non-Hazardous	228	tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ 32,250.60
Approval Fees (Soil/Battery Casings)	1	each	@ \$ 295.00	\$ 1.15	\$ 339.25	\$ 339.25
Transportation (Battery Casings/Soil) as Hazardous	17	load	@ \$ 3,575.00	\$ 1.15	\$ 4,111.25	\$ 69,891.25
Disposal (Battery Casings/Soil) as Hazardous	230	yds <sup>3</sup>	@ \$ 390.00	\$ 1.15	\$ 448.50	\$ 103,155.00
Erosion Control	1	each	@ \$ 10,000.00	\$ 1.15	\$ 11,500.00	\$ 11,500.00
<b>SUBTOTAL:</b>						<b>\$ 310,375.80</b>
<b>2.3 Site Restoration</b>						
Backfill Placement (Clean Overburden)	361	tons	@ \$ 9.05	\$ 1.15	\$ 10.41	\$ 3,757.11
Backfill Supply and Placement	570	tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 6,227.25
Restoration of Stream bank (Excelsior Matting)	250	yds <sup>2</sup>	@ \$ 0.55	\$ 1.15	\$ 0.63	\$ 158.13
Grass Seed	3	bags	@ \$ 95.00	\$ 1.15	\$ 109.25	\$ 327.75
Straw bails	20	bail	@ \$ 5.50	\$ 1.15	\$ 6.33	\$ 126.50
<b>SUBTOTAL:</b>						<b>\$ 10,596.73</b>
<b>3. S&amp;ME Field Activities</b>						
Senior Professional	10	Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Professional	25	Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	50	Hour	@ \$ 85.00	\$ -	\$ -	\$ 4,250.00
Environmental Technician	100	Hour	@ \$ 65.00	\$ -	\$ -	\$ 6,500.00
Field equipment and misc. supplies (gps/dust/gloves)	1	ea	@ \$ 1,000.00	\$ -	\$ -	\$ 1,000.00
<b>SUBTOTAL:</b>						<b>\$ 15,135.00</b>
<b>4. Project Management &amp; Reporting</b>						
Senior Professional	32	Hour	@ \$ 101.00	\$ -	\$ -	\$ 3,232.00
Project Professional	25	Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	45	Hour	@ \$ 85.00	\$ -	\$ -	\$ 3,825.00
CAD Professional	15	Hour	@ \$ 58.00	\$ -	\$ -	\$ 870.00
Secretary	5	Hour	@ \$ 42.50	\$ -	\$ -	\$ 212.50
<b>SUBTOTAL:</b>						<b>\$ 10,514.50</b>
<b>SUBTOTAL ESTIMATE:</b>						<b>\$ 493,540.78</b>
<b>20 % Contingency:</b>						<b>\$ 98,708.16</b>
<b>TOTAL ESTIMATE:</b>						<b>\$ 592,248.94</b>

**Option 2A**  
**Villa Mobile Home Park**  
**612 Venice street**  
**Kannapolis, Cabarrus Co., North Carolina**  
**S&ME Project No. 1054-11-2025**

**Description for Mitigation Option 2A (Hazardous):**

Services include but are not limited to Site-Specific Health and Safety Plan (HASP); obtain necessary permits; installing safety fencing around work area; installing necessary erosion control measures; removal/disposal of mobile home trailers (if necessary); removal and disposal of concrete and asphalt paving; removal of approximately 100 feet of upstream UST culvert; replacement of approximately 125 feet of new piping; excavation and stockpiling of overburden; limited excavation of battery casing/soil and direct loading into roll-off boxes for transportation and disposal; import/place backfill material (around newly installed pipe); restore work area; seed and straw area.

Description	Units		Rate (EVO)	Mark-up	Rates w/ 15%	Cost
<b>1. Project Coordination and Health &amp; Safety Plan</b>						
Senior Professional	10	Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Manager	8	Hour	@ \$ 95.00	\$ -	\$ -	\$ 760.00
Staff Professional	6	Hour	@ \$ 85.00	\$ -	\$ -	\$ 510.00
Secretary	4	Hour	@ \$ 42.50	\$ -	\$ -	\$ 170.00
<b>SUBTOTAL:</b>						<b>\$ 2,450.00</b>
<b>2. Subcontractors</b>						
<b>2.1 Demolition</b>						
Installation of security fencing	1,000	ft	@ \$ 4.50	\$ 1.15	\$ 5.18	\$ 5,175.00
Mobilization of Equipment	1	each	@ \$ 800.00	\$ 1.15	\$ 920.00	\$ 920.00
Trachoe w/ Operator	20	days	@ \$ 1,095.00	\$ 1.15	\$ 1,259.25	\$ 25,185.00
Backhoe w/ Operator	20	days	@ \$ 695.00	\$ 1.15	\$ 799.25	\$ 15,985.00
Transportation/Disposal of Asphalt	3	loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 672.75
Transportation/Disposal of Concrete	5	loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 1,121.25
Transportation/Disposal of UST Culvert	7	loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 1,569.75
Demolition and disposal of mobile home trailers	2	each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ 5,750.00
<b>SUBTOTAL:</b>						<b>\$ 56,378.75</b>
<b>2.2 Excavation Activities</b>						
All applicable Permits (if required)	1	each	@ \$ 1,000.00	\$ 1.15	\$ 1,150.00	\$ 1,150.00
Roll-off Spot Fee (2-boxes with bows and tarp)	1	trip	@ \$ 300.00	\$ 1.15	\$ 345.00	\$ 345.00
Roll-off Liner	1	each	@ \$ 65.00	\$ 1.15	\$ 74.75	\$ 74.75
Roll-off Rental ( 1 box for 1 week)	7	day	@ \$ 15.00	\$ 1.15	\$ 17.25	\$ 120.75
Soil Excavation and Stockpiling (clean overburden)	20	yds <sup>3</sup>	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 218.50
Mobilization of Screener	0	each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ -
Screener Rental	0	mo	@ \$ 13,000.00	\$ 1.15	\$ 14,950.00	\$ -
On-site Chemical Stabilization	0	tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ -
Loading Material into Soil Screener	0	tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ -
Loading Soil into Roll-off Boxes	0	tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ -
Loading Battery Casings into Roll-off Boxes	0	tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ -
Transportation/Disposal (soil only) as Non-Hazardous	0	tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ -
Approval Fees (Soil/Battery Casings)	1	each	@ \$ 295.00	\$ 1.15	\$ 339.25	\$ 339.25
Transportation (Battery Casings/Soil) as Hazardous	1	load	@ \$ 3,575.00	\$ 1.15	\$ 4,111.25	\$ 4,111.25
Disposal (Battery Casings/Soil) as Hazardous	20	yds <sup>3</sup>	@ \$ 390.00	\$ 1.15	\$ 448.50	\$ 8,970.00
Erosion Control	1	each	@ \$ 10,000.00	\$ 1.15	\$ 11,500.00	\$ 11,500.00
<b>SUBTOTAL:</b>						<b>\$ 26,829.50</b>
<b>2.3 Site Restoration</b>						
Backfill Placement (Clean Overburden)	43	tons	@ \$ 9.05	\$ 1.15	\$ 10.41	\$ 447.52
Backfill Supply and Placement	72	tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 786.60
Corrugated Drain Pipe (24")	0	section	@ \$ 540.00	\$ 1.15	\$ 621.00	\$ -
Corrugated Coupling (24")	0	each	@ \$ 60.65	\$ 1.15	\$ 69.75	\$ -
Corrugated Drain Pipe (48")	7	section	@ \$ 1,100.00	\$ 1.15	\$ 1,265.00	\$ 8,855.00
Corrugated Coupling (48")	6	each	@ \$ 125.00	\$ 1.15	\$ 143.75	\$ 862.50
Restoration of Stream bank (Excelsior Matting)	57	yds <sup>2</sup>	@ \$ 0.55	\$ 1.15	\$ 0.63	\$ 36.05
Grass Seed	1	bags	@ \$ 95.00	\$ 1.15	\$ 109.25	\$ 109.25
Straw bails	5	bail	@ \$ 5.50	\$ 1.15	\$ 6.33	\$ 31.63
<b>SUBTOTAL:</b>						<b>\$ 11,128.55</b>
<b>3. S&amp;ME Field Activities</b>						
Senior Professional	10	Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Professional	25	Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	50	Hour	@ \$ 85.00	\$ -	\$ -	\$ 4,250.00
Environmental Technician	100	Hour	@ \$ 65.00	\$ -	\$ -	\$ 6,500.00
Field equipment and misc. supplies (gps/dust/gloves)	1	ea	@ \$ 1,000.00	\$ -	\$ -	\$ 1,000.00
<b>SUBTOTAL:</b>						<b>\$ 15,135.00</b>
<b>4. Project Management &amp; Reporting</b>						
Senior Professional	32	Hour	@ \$ 101.00	\$ -	\$ -	\$ 3,232.00
Project Professional	25	Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	45	Hour	@ \$ 85.00	\$ -	\$ -	\$ 3,825.00
CAD Professional	15	Hour	@ \$ 58.00	\$ -	\$ -	\$ 870.00
Secretary	5	Hour	@ \$ 42.50	\$ -	\$ -	\$ 212.50
<b>SUBTOTAL:</b>						<b>\$ 10,514.50</b>
<b>SUBTOTAL ESTIMATE:</b>						<b>\$ 122,436.30</b>
<b>20 % Contingency:</b>						<b>\$ 24,487.26</b>
<b>TOTAL ESTIMATE:</b>						<b>\$ 146,923.56</b>

**Option 2B**  
**Villa Mobile Home Park**  
**612 Venice street**  
**Kannapolis, Cabarrus Co., North Carolina**  
**S&ME Project No. 1054-11-2025**

**Description for Mitigation Option 2B (Non-Hazardous):**

Services include but are not limited to Site-Specific Health and Safety Plan (HASP); obtain necessary permits; installing safety fencing around work area; installing necessary erosion control measures; removal/disposal of mobile home trailers (if necessary); removal and disposal of concrete and asphalt paving; removal of approximately 100 feet of upstream UST culvert; replacement of approximately 125 feet of new piping; excavation and stockpiling of overburden; limited excavation of battery casing/soil and loading into screener; chemically stabilizing soil; collect a composite soil sample for laboratory analysis (TCLP-Lead); load segregated soil into roll-off boxes for transportation (non-hazardous); load battery casings/soil into roll-off boxes for transportation (hazardous); import/place backfill material; restore work area; seed and straw area.

Description	Units	Rate (EVO)	Mark-up	Rates w/ 15%	Cost
<b>1. Project Coordination and Health &amp; Safety Plan</b>					
Senior Professional	10 Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Manager	8 Hour	@ \$ 95.00	\$ -	\$ -	\$ 760.00
Staff Professional	6 Hour	@ \$ 85.00	\$ -	\$ -	\$ 510.00
Secretary	4 Hour	@ \$ 42.50	\$ -	\$ -	\$ 170.00
<b>SUBTOTAL:</b>					<b>\$ 2,450.00</b>
<b>2. Subcontractors</b>					
<b>2.1 Demolition</b>					
Installation of security fencing	1,000 ft	@ \$ 4.50	\$ 1.15	\$ 5.18	\$ 5,175.00
Mobilization of Equipment	1 each	@ \$ 800.00	\$ 1.15	\$ 920.00	\$ 920.00
Trachoe w/ Operator	30 days	@ \$ 1,095.00	\$ 1.15	\$ 1,259.25	\$ 37,777.50
Backhoe w/ Operator	30 days	@ \$ 695.00	\$ 1.15	\$ 799.25	\$ 23,977.50
Transportation/Disposal of Asphalt	3 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 672.75
Transportation/Disposal of Concrete	5 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 1,121.25
Transportation/Disposal of UST Culvert	7 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 1,569.75
Demolition and disposal of mobile home trailers	4 each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ 11,500.00
<b>SUBTOTAL:</b>					<b>\$ 82,713.75</b>
<b>2.2 Excavation Activities</b>					
All applicable Permits (if required)	1 each	@ \$ 1,000.00	\$ 1.15	\$ 1,150.00	\$ 1,150.00
Roll-off Spot Fee (2-boxes with bows and tarp)	4 trip	@ \$ 300.00	\$ 1.15	\$ 345.00	\$ 1,380.00
Roll-off Liner	8 each	@ \$ 65.00	\$ 1.15	\$ 74.75	\$ 598.00
Roll-off Rental (6 boxes for 2 weeks each)	40 day	@ \$ 15.00	\$ 1.15	\$ 17.25	\$ 690.00
Soil Excavation and Stockpiling (clean overburden)	20 yds <sup>3</sup>	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 218.50
Mobilization of Screener	1 each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ 2,875.00
Screener Rental	1 mo	@ \$ 13,000.00	\$ 1.15	\$ 14,950.00	\$ 14,950.00
On-site Chemical Stabilization	2 tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ 282.90
Loading Material into Soil Screener	58 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 633.65
Loading Soil into Roll-off Boxes	30 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 327.75
Loading Battery Casings into Roll-off Boxes	35 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 382.38
Transportation/Disposal (soil only) as Non-Hazardous	23 tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ 3,253.35
Approval Fees (Soil/Battery Casings)	1 each	@ \$ 295.00	\$ 1.15	\$ 339.25	\$ 339.25
Transportation (Battery Casings/Soil) as Hazardous	3 load	@ \$ 3,575.00	\$ 1.15	\$ 4,111.25	\$ 12,333.75
Disposal (Battery Casings/Soil) as Hazardous	23 yds <sup>3</sup>	@ \$ 390.00	\$ 1.15	\$ 448.50	\$ 10,315.50
Erosion Control	1 each	@ \$ 10,000.00	\$ 1.15	\$ 11,500.00	\$ 11,500.00
<b>SUBTOTAL:</b>					<b>\$ 61,230.03</b>
<b>2.3 Site Restoration</b>					
Backfill Placement (Clean Overburden)	43 tons	@ \$ 9.05	\$ 1.15	\$ 10.41	\$ 447.52
Backfill Supply and Placement	72 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 786.60
Corrugated Drain Pipe (24")	0 section	@ \$ 540.00	\$ 1.15	\$ 621.00	\$ -
Corrugated Coupling (24")	0 each	@ \$ 60.65	\$ 1.15	\$ 69.75	\$ -
Corrugated Drain Pipe (48")	7 section	@ \$ 1,100.00	\$ 1.15	\$ 1,265.00	\$ 8,855.00
Corrugated Coupling (48")	6 each	@ \$ 125.00	\$ 1.15	\$ 143.75	\$ 862.50
Restoration of Stream bank (Excelsior Matting)	0 yds <sup>2</sup>	@ \$ 0.55	\$ 1.15	\$ 0.63	\$ -
Grass Seed	1 bags	@ \$ 95.00	\$ 1.15	\$ 109.25	\$ 109.25
Straw bails	5 bail	@ \$ 5.50	\$ 1.15	\$ 6.33	\$ 31.63
<b>SUBTOTAL:</b>					<b>\$ 11,092.50</b>
<b>3. S&amp;ME Field Activities</b>					
Senior Professional	10 Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Professional	25 Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	50 Hour	@ \$ 85.00	\$ -	\$ -	\$ 4,250.00
Environmental Technician	100 Hour	@ \$ 65.00	\$ -	\$ -	\$ 6,500.00
Field equipment and misc. supplies (gps/dust/gloves)	1 ea	@ \$ 1,000.00	\$ -	\$ -	\$ 1,000.00
<b>SUBTOTAL:</b>					<b>\$ 15,135.00</b>
<b>4. Project Management &amp; Reporting</b>					
Senior Professional	32 Hour	@ \$ 101.00	\$ -	\$ -	\$ 3,232.00
Project Professional	25 Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	45 Hour	@ \$ 85.00	\$ -	\$ -	\$ 3,825.00
CAD Professional	15 Hour	@ \$ 58.00	\$ -	\$ -	\$ 870.00
Secretary	5 Hour	@ \$ 42.50	\$ -	\$ -	\$ 212.50
<b>SUBTOTAL:</b>					<b>\$ 10,514.50</b>
<b>SUBTOTAL ESTIMATE:</b>					<b>\$ 183,135.77</b>
<b>20 % Contingency:</b>					<b>\$ 36,627.15</b>
<b>TOTAL ESTIMATE:</b>					<b>\$ 219,762.93</b>

**Option 3A**  
**Villa Mobile Home Park**  
**612 Venice street**  
**Kannapolis, Cabarrus Co., North Carolina**  
**S&ME Project No. 1054-11-2025**

**Description for Mitigation Option 3A (Hazardous):**

Services include but are not limited to Site-Specific Health and Safety Plan (HASP); obtain necessary permits; installing safety fencing around work area; installing necessary erosion control measures; removal/disposal of mobile home trailers (if necessary); removal of approximately 25 feet of upstream UST culvert; replacement of approximately 45 feet of new piping; excavation and stockpiling of overburden; limited excavation of battery casing/soil and direct loading into roll-off boxes for transportation and disposal (hazardous); import/place backfill material (around newly installed pipe); restore work area; seed and straw area.

Description	Units	Rate (EVO)	Mark-up	Rates w/ 15%	Cost
<b>1. Project Coordination and Health &amp; Safety Plan</b>					
Senior Professional	10 Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Manager	8 Hour	@ \$ 95.00	\$ -	\$ -	\$ 760.00
Staff Professional	6 Hour	@ \$ 85.00	\$ -	\$ -	\$ 510.00
Secretary	4 Hour	@ \$ 42.50	\$ -	\$ -	\$ 170.00
<b>SUBTOTAL:</b>					<b>\$ 2,450.00</b>
<b>2. Subcontractors</b>					
<b>2.1 Demolition</b>					
Installation of security fencing	1,000 ft	@ \$ 4.50	\$ 1.15	\$ 5.18	\$ 5,175.00
Mobilization of Equipment	1 each	@ \$ 800.00	\$ 1.15	\$ 920.00	\$ 920.00
Trachoe w/ Operator	10 days	@ \$ 1,095.00	\$ 1.15	\$ 1,259.25	\$ 12,592.50
Backhoe w/ Operator	10 days	@ \$ 695.00	\$ 1.15	\$ 799.25	\$ 7,992.50
Transportation/Disposal of Asphalt	0 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ -
Transportation/Disposal of Concrete	0 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ -
Transportation/Disposal of UST Culvert	2 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 448.50
Demolition and disposal of mobile home trailers	0 each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ -
<b>SUBTOTAL:</b>					<b>\$ 27,128.50</b>
<b>2.2 Excavation Activities</b>					
All applicable Permits (if required)	1 each	@ \$ 1,000.00	\$ 1.15	\$ 1,150.00	\$ 1,150.00
Roll-off Spot Fee (2-boxes with bows and tarp)	1 trip	@ \$ 300.00	\$ 1.15	\$ 345.00	\$ 345.00
Roll-off Liner	1 each	@ \$ 65.00	\$ 1.15	\$ 74.75	\$ 74.75
Roll-off Rental (21box for 5days)	5 day	@ \$ 15.00	\$ 1.15	\$ 17.25	\$ 86.25
Soil Excavation and Stockpiling (clean overburden)	10 yds <sup>3</sup>	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 109.25
Mobilization of Screener	0 each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ -
Screener Rental	0 mo	@ \$ 13,000.00	\$ 1.15	\$ 14,950.00	\$ -
On-site Chemical Stabilization	0 tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ -
Loading Material into Soil Screener	0 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ -
Loading Soil into Roll-off Boxes	0 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ -
Loading Battery Casings into Roll-off Boxes	0 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ -
Transportation/Disposal (soil only) as Non-Hazardous	0 tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ -
Approval Fees (Soil/Battery Casings)	1 each	@ \$ 295.00	\$ 1.15	\$ 339.25	\$ 339.25
Transportation (Battery Casings/Soil) as Hazardous	1 load	@ \$ 3,575.00	\$ 1.15	\$ 4,111.25	\$ 4,111.25
Disposal (Battery Casings/Soil) as Hazardous	10 yds <sup>3</sup>	@ \$ 390.00	\$ 1.15	\$ 448.50	\$ 4,485.00
Erosion Control	1 each	@ \$ 10,000.00	\$ 1.15	\$ 11,500.00	\$ 11,500.00
<b>SUBTOTAL:</b>					<b>\$ 22,200.75</b>
<b>2.3 Site Restoration</b>					
Backfill Placement (Clean Overburden)	16 tons	@ \$ 9.05	\$ 1.15	\$ 10.41	\$ 166.52
Backfill Supply and Placement	15 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 163.88
Corrugated Drain Pipe (24")	0 section	@ \$ 540.00	\$ 1.15	\$ 621.00	\$ -
Corrugated Coupling (24")	0 each	@ \$ 60.65	\$ 1.15	\$ 69.75	\$ -
Corrugated Drain Pipe (48")	3 section	@ \$ 1,100.00	\$ 1.15	\$ 1,265.00	\$ 3,795.00
Corrugated Coupling (48")	3 each	@ \$ 125.00	\$ 1.15	\$ 143.75	\$ 431.25
Restoration of Stream bank (Excelsior Matting)	0 yds <sup>2</sup>	@ \$ 0.55	\$ 1.15	\$ 0.63	\$ -
Grass Seed	1 bags	@ \$ 95.00	\$ 1.15	\$ 109.25	\$ 109.25
Straw bails	5 bail	@ \$ 5.50	\$ 1.15	\$ 6.33	\$ 31.63
<b>SUBTOTAL:</b>					<b>\$ 4,697.52</b>
<b>3. S&amp;ME Field Activities</b>					
Senior Professional	10 Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Professional	25 Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	50 Hour	@ \$ 85.00	\$ -	\$ -	\$ 4,250.00
Environmental Technician	100 Hour	@ \$ 65.00	\$ -	\$ -	\$ 6,500.00
Field equipment and misc. supplies (gps/dust/gloves)	1 ea	@ \$ 1,000.00	\$ -	\$ -	\$ 1,000.00
<b>SUBTOTAL:</b>					<b>\$ 15,135.00</b>
<b>4. Project Management &amp; Reporting</b>					
Senior Professional	24 Hour	@ \$ 101.00	\$ -	\$ -	\$ 2,424.00
Project Professional	25 Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	45 Hour	@ \$ 85.00	\$ -	\$ -	\$ 3,825.00
CAD Professional	15 Hour	@ \$ 58.00	\$ -	\$ -	\$ 870.00
Secretary	5 Hour	@ \$ 42.50	\$ -	\$ -	\$ 212.50
<b>SUBTOTAL:</b>					<b>\$ 9,706.50</b>
<b>SUBTOTAL ESTIMATE:</b>					<b>\$ 81,318.27</b>
<b>20 % Contingency:</b>					<b>\$ 16,263.65</b>
<b>TOTAL ESTIMATE:</b>					<b>\$ 97,581.92</b>

**Option 3B**  
**Villa Mobile Home Park**  
**612 Venice street**  
**Kannapolis, Cabarrus Co., North Carolina**  
**S&ME Project No. 1054-11-2025**

**Description for Mitigation Option 3B (Non-Hazardous):**

Services include but are not limited to Site-Specific Health and Safety Plan (HASP); obtain necessary permits; installing safety fencing around work zone; installing necessary erosion control measures; removal/disposal of mobile home trailers (if necessary); removal of approximately 25 feet of upstream UST culvert; replacement of approximately 45 feet of new piping; excavation and stockpiling of overburden; limited excavation of battery casing/soil and loading into screener; chemically stabilizing soil; collect a composite soil sample for laboratory analysis (TCLP-Lead); load segregated soil into roll-off boxes for transportation (non-hazardous); load battery casings/soil into roll-off boxes for transportation (hazardous); import/place backfill material; restore work area; seed and straw area.

Description	Units	Rate (EVO)	Mark-up	Rates w/ 15%	Cost
<b>1. Project Coordination and Health &amp; Safety Plan</b>					
Senior Professional	10 Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Manager	8 Hour	@ \$ 95.00	\$ -	\$ -	\$ 760.00
Staff Professional	6 Hour	@ \$ 85.00	\$ -	\$ -	\$ 510.00
Secretary	4 Hour	@ \$ 42.50	\$ -	\$ -	\$ 170.00
<b>SUBTOTAL:</b>					<b>\$ 2,450.00</b>
<b>2. Subcontractors</b>					
<b>2.1 Demolition</b>					
Installation of security fencing	1,000 ft	@ \$ 4.50	\$ 1.15	\$ 5.18	\$ 5,175.00
Mobilization of Equipment	1 each	@ \$ 800.00	\$ 1.15	\$ 920.00	\$ 920.00
Trachoe w/ Operator	15 days	@ \$ 1,095.00	\$ 1.15	\$ 1,259.25	\$ 18,888.75
Backhoe w/ Operator	15 days	@ \$ 695.00	\$ 1.15	\$ 799.25	\$ 11,988.75
Transportation/Disposal of Asphalt	0 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ -
Transportation/Disposal of Concrete	0 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ -
Transportation/Disposal of UST Culvert	2 loads	@ \$ 195.00	\$ 1.15	\$ 224.25	\$ 448.50
Demolition and disposal of mobile home trailers	2 each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ 5,750.00
<b>SUBTOTAL:</b>					<b>\$ 43,171.00</b>
<b>2.2 Excavation Activities</b>					
All applicable Permits (if required)	1 each	@ \$ 1,000.00	\$ 1.15	\$ 1,150.00	\$ 1,150.00
Roll-off Spot Fee (2-boxes with bows and tarp)	1 trip	@ \$ 300.00	\$ 1.15	\$ 345.00	\$ 345.00
Roll-off Liner	2 each	@ \$ 65.00	\$ 1.15	\$ 74.75	\$ 149.50
Roll-off Rental (2 boxes for 5days each)	10 day	@ \$ 15.00	\$ 1.15	\$ 17.25	\$ 172.50
Soil Excavation and Stockpiling (clean overburden)	10 yds <sup>3</sup>	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 109.25
Mobilization of Screener	1 each	@ \$ 2,500.00	\$ 1.15	\$ 2,875.00	\$ 2,875.00
Screener Rental	1 mo	@ \$ 13,000.00	\$ 1.15	\$ 14,950.00	\$ 14,950.00
On-site Chemical Stabilization	27 tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ 3,819.15
Loading Material into Soil Screener	27 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 294.98
Loading Soil into Roll-off Boxes	11 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 120.18
Loading Battery Casings into Roll-off Boxes	16 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 174.80
Transportation/Disposal (soil only) as Non-Hazardous	11 tons	@ \$ 123.00	\$ 1.15	\$ 141.45	\$ 1,555.95
Approval Fees (Soil/Battery Casings)	1 each	@ \$ 295.00	\$ 1.15	\$ 339.25	\$ 339.25
Transportation (Battery Casings/Soil) as Hazardous	1 load	@ \$ 3,575.00	\$ 1.15	\$ 4,111.25	\$ 4,111.25
Disposal (Battery Casings/Soil) as Hazardous	10 yds <sup>3</sup>	@ \$ 390.00	\$ 1.15	\$ 448.50	\$ 4,485.00
Erosion Control	1 each	@ \$ 10,000.00	\$ 1.15	\$ 11,500.00	\$ 11,500.00
<b>SUBTOTAL:</b>					<b>\$ 46,151.80</b>
<b>2.3 Site Restoration</b>					
Backfill Placement (Clean Overburden)	16 tons	@ \$ 9.05	\$ 1.15	\$ 10.41	\$ 166.52
Backfill Supply and Placement	15 tons	@ \$ 9.50	\$ 1.15	\$ 10.93	\$ 163.88
Corrugated Drain Pipe (24")	0 section	@ \$ 540.00	\$ 1.15	\$ 621.00	\$ -
Corrugated Coupling (24")	0 each	@ \$ 60.65	\$ 1.15	\$ 69.75	\$ -
Corrugated Drain Pipe (48")	3 section	@ \$ 1,100.00	\$ 1.15	\$ 1,265.00	\$ 3,795.00
corrugated Coupling (48")	3 each	@ \$ 125.00	\$ 1.15	\$ 143.75	\$ 431.25
Restoration of Stream bank (Excelsior Matting)	0 yds <sup>2</sup>	@ \$ 0.55	\$ 1.15	\$ 0.63	\$ -
Grass Seed	1 bags	@ \$ 95.00	\$ 1.15	\$ 109.25	\$ 109.25
Straw bails	5 bail	@ \$ 5.50	\$ 1.15	\$ 6.33	\$ 31.63
<b>SUBTOTAL:</b>					<b>\$ 4,697.52</b>
<b>3. S&amp;ME Field Activities</b>					
Senior Professional	10 Hour	@ \$ 101.00	\$ -	\$ -	\$ 1,010.00
Project Professional	25 Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	50 Hour	@ \$ 85.00	\$ -	\$ -	\$ 4,250.00
Environmental Technician	100 Hour	@ \$ 65.00	\$ -	\$ -	\$ 6,500.00
Field equipment and misc. supplies (gps/dust/gloves)	1 ea	@ \$ 1,000.00	\$ -	\$ -	\$ 1,000.00
<b>SUBTOTAL:</b>					<b>\$ 15,135.00</b>
<b>4. Project Management &amp; Reporting</b>					
Senior Professional	24 Hour	@ \$ 101.00	\$ -	\$ -	\$ 2,424.00
Project Professional	25 Hour	@ \$ 95.00	\$ -	\$ -	\$ 2,375.00
Staff Professional (II)	45 Hour	@ \$ 85.00	\$ -	\$ -	\$ 3,825.00
CAD Professional	15 Hour	@ \$ 58.00	\$ -	\$ -	\$ 870.00
Secretary	5 Hour	@ \$ 42.50	\$ -	\$ -	\$ 212.50
<b>SUBTOTAL:</b>					<b>\$ 9,706.50</b>
<b>SUBTOTAL ESTIMATE:</b>					<b>\$ 121,311.82</b>
<b>20 % Contingency:</b>					<b>\$ 24,262.36</b>
<b>TOTAL ESTIMATE:</b>					<b>\$ 145,574.18</b>