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REC-LEAD

WORK PLAN FOR A PHASE II REMEDIAL INVESTIGATION FORMER EATON CORPORATION FACILITY 1100 EAST PRESTON STREET SELMA, NORTH CAROLINA Longitude W78°17'02", Latitude N35°31'33" NCD981858806

Prepared for:
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Solutions-IES Project No. 6010.08A2.EATN

February 17, 2009

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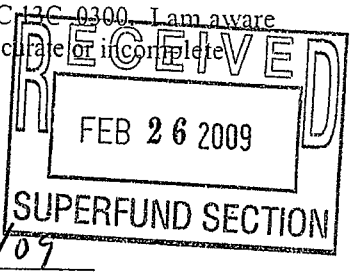
Solutions-IES
Industrial & Environmental Services

REGISTERED SITE MANAGER CERTIFICATION STATEMENT (.0306(b)(1)):

"I certify under penalty of law that I am personally familiar with the information contained in this submittal, including any and all supporting documents accompanying this certification, and that the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete and complies with the Inactive Hazardous Sites Response Act G.S. 130A-310, et seq. and the remedial action program Rules 15A NCAC 13C .0300. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."



M. TONY LIEBERMAN
(Name of Registered Site Manager)

* M. Tony Lieberman
(Signature of Registered Site Manager)

* 2/26/09
Date

* ***NOTE: The RSM certifies all documents LAST. Failure to do so is a violation of 15A NCAC 13C .0306(b)(2) of the REC Rules and subject to possible enforcement action against the REC and/or RSM.***

North Carolina (Enter State)

Wake **COUNTY**

I, Mary Jean Howard, a Notary Public of said County and State, do hereby certify that M. Tony Lieberman did personally appear and sign before me this day, produced proper identification in the form of Drivers License was duly sworn or affirmed, and declared that, he or she is the duly authorized environmental consultant of the remediating party of the property referenced above and that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 26th day of February, 2009.

Mary Jean Howard
Notary Public (signature)

(OFFICIAL SEAL)

My commission expires: 6/17/09

REMEDIATING PARTY CERTIFICATION STATEMENT (.0306(b)(2)):

"I certify under penalty of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Jeffrey Allen
(Name of Remediating Party Official)

* _____ * 2/24/09
(Signature of Remediating Party Official) Date

*NOTE: ***The RSM certifies all documents <u>LAST</u>. Failure to do so is a violation of 15A NCAC 13C .0306(b)(2) of the REC Rules and subject to possible enforcement action against the REC and/or RSM.***

Ohio (Enter State)

Cuyahoga **COUNTY**

I, William F Hogsett, a Notary Public of said County and State, do hereby certify that Jeffrey Allen did personally appear and sign before me this day, produced proper identification in the form of driver's license, was duly sworn or affirmed, and declared that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 24 day of February, 2009.

William F. Hogsett
Notary Public (signature) (OFFICIAL SEAL)

My commission expires: _____.

WILLIAM F. HOGSETT, Attorney
NOTARY PUBLIC - STATE OF OHIO
My commission has no expiration date,
Section 147.03 R.C.

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1.0 INTRODUCTION

The former Eaton Corporation (Eaton) facility (Site) is located at 1100 East Preston Street (St.) in Selma, Johnston County, North Carolina (**Figure 1**). In January 2008, a prospective purchaser completed an Environmental Site Assessment (ESA) of the property and identified volatile organics in soil and groundwater. Based on this discovery, Eaton contracted Solutions-IES to help manage the environmental issues identified in the ESA. Solutions-IES, Inc. (Solutions-IES) evaluated the interior of the building for vapor intrusion and prepared and implemented a Phase I Remedial Investigation in general accordance with and anticipating Eaton's entrance into the Registered Environmental Consultant (REC) Program as administered by the Inactive Hazardous Sites Branch (IHSB), Superfund Section, Division of Waste Management (DWM), North Carolina Department of Environment and Natural Resources (NCDENR). In October 2008, Eaton applied for admission to the REC Program. The final Administrative Agreement was executed by NCDENR on February 10, 2009 (**Appendix A**). Solutions-IES is the designated REC for this project on behalf of Eaton, the Responsible Party (RP).

The Phase I RI presented the Site history, local hydrogeology, and adjacent land use; identified potable water sources; and reviewed the environmental investigations conducted to date. The report concluded that volatile constituents of concern were identified in soil and groundwater at the Site, but their extent was not defined. The Phase I RI Work Plan and RI Report are included as **Appendix B**.

This Phase II RI Work Plan is the first certified document prepared under the REC Program guidance and describes a plan for further delineating the VOC constituents both onsite and offsite in addition to evaluating the presence of metals and other semi-volatile organic compounds (SVOCs) in soil and groundwater. A summary of the available information on disposal history and site characteristics as required by the REC Implementation Guidance is presented below. Additional details can be found in the associated sections of the Phase I RI Report **(Appendix B)**.

2.0 SITE HISTORY

2.1 SITE SETTING AND SURROUNDING LAND USE

The Eaton Selma facility is approximately 20 acres of developed and wooded land with a 90,000 square foot manufacturing building and three smaller storage buildings located north of the manufacturing building. The manufacturing building was constructed and added onto in three phases as referred to on

reviewed construction and as-built drawings. The Site layout and surrounding vicinity are presented on **Figure 2**.

In general, the area is zoned industrial with residential properties to the southwest of the Site. Immediately surrounding properties are shown in **Figure 3** and include the following:

- Wooded land to the north (zoned Industrial) owned by NSEW Corporation;
- Preston Street to the east, across which the following industrially zoned lands are located:
  - Wooded land owned by NSEW Corporation through which runs Bawdy Swamp Creek;
  - Sudan Animated Animals;
  - Johnston County Shriner's Club;
- Vacant industrially zoned land to the south owned by Ralph L. Stancil;
- Vacant industrially zoned land to the west owned by Paul H. Howard; and
- Medium density residential (residential overlay zoned) land to the southwest owned by:
  - Edward Joe Soard[1];
  - Eddie Sword[1]; and
  - Walter Ricks II.

2.2 OPERATONAL HISTORY

Based on a historical review of the property conducted by Mid-Atlantic Associates (MAA) in January 2008, the subject Site was agricultural land before it was first developed in 1958. The property was originally developed by Mr. John Shallcross of Johnston County Industries, Inc. The original building included Phase I of the manufacturing building and the Cardboard Storage Building. Cutler Hammer Corp. purchased the Site in 1967 and Phase II of the building was added in 1968. The Eaton Corporation bought the Site in 1976. Eaton added Phase III to the building in 1977 along with the Oil Storage Building. The Wood Storage Building was built in 2003. The locations of the manufacturing building and various outbuildings are shown in **Figures 2 and 3.**

The facility was used to manufacture and assemble winding resistors, small parts and switches. Various industrial processes were employed at the plant, including injection molding (thermoset and thermoplastic), metal stamping, and parts cleaning and washing. The facility also stored and used a variety of oils, hydraulic fluids and solvents in their processes. Details of past storage practices are unknown. Eaton moved their operations from Selma in October 2007 and placed the property for sale. In early 2008, Johnston County Industries (JCI) purchased the property and after renovations, re-opened the

[1] Edward Soard and Eddie Sword spelled as shown on the tax map may be the same owner.

facility in July 2008 as a community rehabilitative center to evaluate, train, and return individuals with vocational barriers to employment.

As part of MAA's ESA, a search of environmental records was conducted by Environmental Data Resources (EDR). According to Eaton, the results are included as an appendix of MAA's report, but were not made available to Eaton. If the information becomes available, it will be included in Phase II RI Report. MAA also determined that Sanborn Fire Insurance Maps do not exist for this area.

2.2.1 Hazardous Waste Management

Historic records suggest that the facility stored and used a variety of oils, hydraulic fluids and solvents in their processes. Based upon the historical review conducted by MAA, the following information regarding past practices was noted:

- Long-term storage and use of oil, solvents, hydraulic fluids and similar fluids;
- Documented oil staining from manufacturing equipment; and
- The use of two sumps (now abandoned by filling with concrete) for parts cleaning/washing.

2.3 ENVIRONMENTAL PERMITS AND REGULATORY HISTORY

As part of the Phase I RI (**Appendix B**), several Federal and State databases were reviewed to determine the Site's regulatory history and identify any environmental permits that might be in place. The following agencies' listings were reviewed:

- USEPA/NCDENR DWM Small Quantity Generators Listing;
- The Resource Conservation and Recovery Act (RCRA);
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) which includes:
    - USEPA Superfund National Priorities List (NPL);
    - USEPA Superfund;
- NCDENR Division of Waste Management IHSB; and
- NCDENR Groundwater Incident Number.

The facility's EPA identification number was noted in the records as NCD981858806. The former Eaton facility was reported to be a small quantity generator. However, there were no past or current permits in any of the databases reviewed. The existing identification number will be used to identify the site for future REC-related assessment and remediation activities.

The first indication of a release on the property was discovered in January 2008 as a result of an environmental assessment conducted for a potential purchaser. Two main environmental assessments and two air quality monitoring events have been conducted since that time. Environmental activities completed to date are summarized below.

- MAA conducted an ESA in early January 2008 including a historical and regulatory records review. Several hydrocarbon and chlorinated constituents (predominantly tetrachloroethene [PCE]) in excess of the North Carolina 15A NCAC 2L .0202 North Carolina Groundwater Quality Standards (NC 2L Standards) were reported in groundwater. A copy of the MAA report is included in Appendix A of the Phase I RI report **(Appendix B)**.

- Solutions-IES conducted a Site visit on February 27, 2008 to gather preliminary information about the Site and surrounding properties. At the same time and at the request of Eaton, Solutions-IES' subcontractor (Trigon Engineering Consultants, Inc.) conducted indoor ambient air quality monitoring on February 27, 2008. The indoor air quality monitoring events indicated that the constituents detected were below their respective Generic Screening Levels (GSL)[2] for indoor air, as well as the NC Department of Labor Occupational Safety and Health Division (OSHD) permissible exposure limits (PELs) and American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit values (TLVs) established for worker safety. The Trigon report is in Appendix A of the Phase I RI report **(Appendix B)**.

- On March 6, 2008, MAA independently conducted indoor ambient air quality monitoring and a soil gas survey beneath the building slab. The soil gas survey samples were collected between 0.5 and 1-foot beneath the bottom of the building slab. The MAA report is provided in Appendix A of the Phase I RI report **(Appendix B)**. Although, seven of the eight soil gas sampling locations reported the presence of PCE and 1,4-dioxane, none of the constituent concentrations exceeded their respective GSL[3] for indoor air, as well as the OSHD PELs and ACGIH TLVs established for worker safety.

- Solutions-IES began field activities as part of a Phase I RI in May 2008. The Phase I RI findings are summarized in Section 4 of this report, and the complete Phase I RI Report is provided in **Appendix B**.

[2] Correlating to 10^{-5} risk as published in the November 2002 OSWER 530-D-02-004 *Draft Guidance for Evaluating the Vapor Intrusion in Indoor Air Pathway from Groundwater and Soil.*
[3] ibid.

3.0 REGIONAL GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

3.1 PHYSIOGRAPHY AND GEOLOGY

The Site is located at the boundary between the Coastal Plain and Piedmont Physiographic Provinces where Coastal Plain sediments feather onto residual soil weathered from metamorphic and igneous bedrock. The 1985 Geologic Map of North Carolina shows the Site area to be underlain by recent-aged terrace deposits and upland sediments that are described as gravel, clayey sand, and sand with minor occurrences of iron-cemented sandstone. Marine sediments of the Yorktown Formation have been mapped approximately 2 miles southeast as isolated outcrops southwest of the Site. Older Cretaceous-aged sediments of the Cape Fear and Middendorf Formations are mapped several miles southwest and east of the Site. Crystalline bedrock, mapped as biotite gneiss and felsic metavolcanics, is present a few miles west of the Site. The Coastal Plain sediments thicken considerably within a short distance to the east.

3.2 HYDROGEOLOGY

The conceptual hydrogeologic model for the Piedmont is based on a slope aquifer system where precipitation infiltrates through the unsaturated zone to recharge the water table. Groundwater moves down slope in response to gravity and discharges as springs in the topographic lows and as base flow to perennial streams and rivers. In most cases, the water table surface mimics the overlying land surface and surface topography can be used to estimate groundwater flow direction.

The typical Piedmont aquifer system is divided into three zones. These zones include the unconsolidated saturated soil (regolith) zone, the underlying saprolite and highly weathered unconsolidated rock lower aquifer, and the bedrock. The base of the Piedmont bedrock aquifer is indistinct and occurs where the fracture system is no longer effective in transmitting flow. The number of fractures decreases with increasing depth, and often fractures are non-water bearing below a depth of approximately 300 feet[4].

The soils present at the Site are typically somewhat poorly to poorly drained soils on broad smooth flats and in shallow depressions in the uplands on the Coastal Plain. Surface soils in undisturbed areas at the Site tend to consist of a few inches of topsoil underlain by residual sedimentary deposits of sands, clays

[4] Heath, R.C. 1980. Ground-Water Regions of the United States. United States Geological Survey Water Supply Paper 2232.

and silts. The Site soils have been mapped[5] as Rains, Goldsboro and Lynchburg sandy loams, and Rains Urban Land Complex Series soils consisting of poorly drained sandy loam (Figure 3-1 of the RI Report, **Appendix B**). The typical soil sequence consists of approximately 5 inches of gray sandy loam overlying several feet of red silty clay, with a Unified Soil Classification System (USCS) designation of "CL", which is underlain by silty or clayey sandy soils (USCS designation ML) that transitions with increasing depth into slightly silty or slightly clayey sand mixtures (SP and SM) containing low but varying amounts of phosphatic sand grains.

Based upon the potentiometric elevations recorded in June and July 2008, groundwater flow is toward the west-northwest. Deeper groundwater flow within the residual soil and weathered bedrock (deep aquifer) is expected to be primarily to the east and southeast mimicking the general dip trend of the coastal plain sediments.

The lithologies encountered during the Geoprobe® and drilling activities during May and June 2008 included sand, silt and clay of sedimentary origin. Groundwater was initially encountered in silty and clayey sand under confining or semi-confining conditions approximately 8 to 10 feet below ground surface (ft bgs). Groundwater generally attained static conditions between approximately 7 to 4.5 ft bgs in June and July 2008.

The groundwater assessment activities at the Site so far have been limited to the residual, unconsolidated portion of the surficial aquifer where 18 temporary Geoprobe® borings and five permanent wells were completed. MW-2 was completed as the deepest well and terminated in silt at approximately 30 ft bgs (**Figure 3**).

The monitoring wells have a measuring point elevation surveyed in relative to a Site datum referenced to mean sea level (msl). Groundwater elevations at each of the well locations were calculated by measuring the depth to water in the wells and subtracting that depth from the measuring point elevation of the respective well.

[5] U.S. Department of Agriculture, Soil Conservation Service, 1994, Soil Survey of Johnston County, Sheet 7 and Johnston County GIS system 2008.

3.4 NEARBY POTABLE WATER SUPPLIES AND WELLS

During the ESA conducted by MAA, no water supply wells were reported in the vicinity of the facility. However, during the initial Site reconnaissance conducted by Solutions-IES, one water-supply well was observed approximately 1,000 ft south of the Site. Water supply wells for the Town of Selma, located north and west of the Site (**Figure 1**), are screened both in the Upper Cape Fear Formation and the underlying slate bedrock at an approximate depth of 300 ft bgs. Reportedly[6], the Town of Selma may be installing a new well within ½-mile of the Site in the near future. The progress of this action by Selma will be monitored during the investigation and remedial phases of this project.

3.3 SENSITIVE ENVIRONMENTS SURVEY

A sensitive environments survey performed by the NCDENR Division of Water Quality (DWQ) and the United States Army Corp of Engineers (USACE) reported this area to be environmentally sensitive (see Appendix G of the Phase I RI Report [**Appendix B**]). The DWQ made their determination because Bawdy Swamp is a tributary to the nutrient sensitive Neuse River. The USACE has determined that the Site does contain wetlands. During the Phase II RI activities, these sensitive environments will be further assessed as detailed below in Section 5. New information will be added to the previous sensitive environments and receptor survey, as relevant to the Phase II RI.

4.0 SUMMARY OF PHASE I REMEDIAL INVESTIGATION RESULTS

During May and June 2008, Solutions-IES conducted a Phase I RI of soil and groundwater at the site. The Phase I Remedial Investigation Report was submitted to Eaton in September 2008 (**Appendix B**). During the Phase I RI, 18 soil borings were advanced with DPT methods and five groundwater monitoring wells were installed. The soil near the former Oil Storage Building area appears to be a source of soil and groundwater impacts at the Site. Soil and groundwater samples were analyzed for VOCs, and the results are presented in Tables 5-1 and 5-2 of the Phase I RI Report, respectively. VOCs reported above the Health Based Soil Remediation Goals (SRGs) in soil samples include the following:

1,2-Dichlorobenzene	Methylene Chloride	Vinyl Chloride
1,4-Dichlorobenzene	Tetrachloroethene	
Carbon Tetrachloride	Trichloroethene	

[6] Personal Communication: September 5, 2008, Solutions-IES and Mr. Joe Price of Selma Public Utilities.

Soil impacts appeared to be primarily limited to the vicinity of the former Oil Storage Building (Figures 5-1 and 5-2 in the Phase I RI Report) and along subsurface stormwater piping that parallels the northern property line. The extent of the soil impacts to the north (off-site) has not been delineated. Soil in the immediate vicinity of the Oil Storage Building and paralleling the underground utilities between the Oil Storage Building and East Preston Street are impacted and the horizontal and vertical extent in this direction also needs to be further delineated.

The VOCs reported above the NC 2L Standard in groundwater samples include the following:

Acetone	Carbon Tetrachloride	1,1,2,2-Tetrachloroethane
Benzene	1,1-Dichloroethane	Tetrachloroethene
1,2-Dichlorobenzene	1,1-Dichloroethene	1,1,1-Trichloroethane
1,4-Dichlorobenzene	*Cis*-1,2-Dichloroethene	1,1,2-Trichloroethane
Bromomethane	Methylene Chloride	Trichloroethene
Dibromochloromethane	1,1,1,2-Tetrachloroethane	Vinyl chloride

The groundwater plume to the north and east onto adjacent properties has not yet been delineated (Figures 5-3 and 5-4 in the Phase I Report). Volatile organic compounds in groundwater have not been defined laterally and may be present to the north or northwest of the Site. The horizontal groundwater gradient is relatively flat and the flow velocity is slow, approximately 7 ft/year[7]. Based on limited data, the direction of groundwater flow appears to be northward, but could vary seasonally. Below-grade utilities, particularly the storm sewer, may have influenced the plume's migration in a direction opposite to the apparent local groundwater flow direction when the water table is high.

Clayey sand, located below approximately 7.5 to 8 ft bgs comprises the surficial aquifer below the site. The sand occurs beneath near surface clays that may confine the water table surface. A few clay layers were observed in the sand and appear to be limited in extent. Deeper well MW-2, terminated in silt, still contained low VOC concentrations. The vertical extent of impacts was not defined in the Phase I RI. This silt may restrict further vertical migration of groundwater impact if it is present across the Site.

[7] Page 16, Phase I RI Report

5.0 PHASE II REMEDIAL INVESTIGATION OBJECTIVES

The Phase I RI identified elevated VOC concentrations in soil and groundwater near the northern property boundary in the vicinity of the former oil storage areas. The objectives of the Phase II activities proposed in this Work Plan are to:

1. Better understand any influence of the stormwater system on contaminant profile in soil and groundwater;
2. Evaluate whether other constituents such as metals, or SVOCs including 1,4-dioxane (due to its association with detected chlorinated ethanes) are present;
3. Remove pesticides, PCBs, cyanide and formaldehyde from further consideration, based on Generator knowledge that these chemicals were never used at the site.
4. Delineate the areal and vertical extent of constituents exceeding Preliminary Remediation Goals (PRGs) in soil;
5. Delineate the areal and vertical extent of constituents exceeding North Carolina 15A NCAC 2L Groundwater Quality Standards (2L Standards) for groundwater;
6. Evaluate the potential for contaminants to have migrated off site and impacted soil, groundwater and or surface water and sediment; and
7. Gather data necessary to support potential remedial alternatives for site media.

5.1 FIELD ACTIVITIES

Access agreements will be secured for off-site monitoring wells. Both off-site properties being assessed during this investigation are owned by NSEW Corporation. The field activities will be performed in three mobilizations with information gained from each trip to the site being used to refine and guide subsequent site activities. Work to be completed during the first mobilization will include:

- Collection of background soil samples to determine background concentrations of metals in soil.
- Evaluation of utility and stormwater lines, site drainage features, and Bawdy Swamp Creek across East Preston Street.
- Refinement of the number and type of target chemicals of concern. The first phase of the work concentrated on laboratory analyses of only VOCs. Two samples (1 soil and 1 groundwater) will be analyzed for metals and SVOCs with tentatively identified compounds (TICs).

After the COCs have been identified and drainage features are better understood, more extensive sampling of soil and groundwater will be conducted during the second field event. This event will evaluate the lateral extent of the site contaminants. Since most of the work during the second event will be in wooded areas off site, hand augers and drive point well screens will be used to the maximum extent practical to open a series of borings and construct temporary wells. The results of soil and groundwater testing from these locations will be used to position permanent monitor wells during the third event. Details of each field event are described below.

5.1.1 Field Event 1 – Offsite Reconnaissance and Analyte Screening

An outline of the activities for Field Event 1 is as follows:

- Site reconnaissance of the adjacent properties and surface drainage features;
- Collection of three background soil samples with hand auger for background metals analysis;
- Installation of up to four drive-point piezometers for water table interpretation;
- Collection of a soil sample in the MW-2 area and groundwater sample from MW-2 for analysis of:
    - VOCs plus tentatively identified compounds (TICs) by EPA Method 8260B;
    - SVOCs including 1-4, dioxane, plus TICs by EPA Method 8270C;
    - Hazardous Substance List Metals (metals) by EPA Method 6010 and 7471 (mercury only).
- Evaluation of the results of the one soil and groundwater sample collected from the vicinity of MW-2 would be analyzed for SVOCs including 1,4-dioxane, and metals to determine if subsequent samples can be analyzed for VOCs, only.

This field event will include a reconnaissance of the Site property and adjacent properties, collection of background soil samples, piezometer installations and the collection of a groundwater sample from MW-2 and a soil sample from the immediate surrounding area. The site reconnaissance will be conducted to determine the field characteristics and layout of the adjacent properties north and east of the Site. This review of the area will include a survey of potential sensitive environments on the Site and adjacent property, the continuity of existing drainage and wetland features, layout of proposed borings and temporary wells, and measuring depth-to-water in the existing wells to determine the groundwater flow direction.

To establish natural, background, site-specific concentrations of metals, three background soil samples will be collected using hand auger techniques (BG-1 to BG-3, **Table 1**). Two alternate locations, BG-4 and BG-5 are also shown on the table and in **Figure 3.** The background samples will be collected from an anticipated depth of 1 to 2 ft bgs. One soil sample will also be collected from the area in the vicinity of SB-6/MW-2 for analysis of VOCs plus TICs via EPA method 8260B, SVOCs (including 1,4-dioxane) plus TICs via EPA Method 8270C and 14 Hazardous Substance List metals via SW-846 Methods. This sample will also be collected from a depth of approximately 1 to 2 ft bgs. Groundwater from monitoring well MW-2 will also be sampled and analyzed for VOCs plus TICs (EPA method 8260B), SVOCs (including 1, 4-dioxane), plus TICs, (EPA method 8270C), and metals (SW-846 Methods). The results of this soil and groundwater sampling will be used to identify the COCs present at the site and if possible, reduce the number of future analytical parameters being analyzed in subsequent events. The proposed borings with respective sampling parameters are listed in **Table 1**. **Table 2** summarizes the laboratory

bottles and preservatives that are anticipated to be used for each analytical sample type collected. The proposed boring locations are presented on **Figure 3.**

Up to four ¾-inch pipe drive points with 1-foot long screens will be installed to a depth of approximately 5 to 7 ft bgs for use as piezometers (PZ-1 to PZ-4). The piezometers will be used to determine if the clays and silts overlying the surficial aquifer are semi-confining and do not yield any water, or if the sediments are saturated up to the level that groundwater rises when the aquifer is broached. Up to two piezometers will be installed near the stream that flows into Bawdy Swamp to better understand groundwater to surface water discharge. The location of the other two piezometers will be based upon the site reconnaissance conducted in the initial stages of this field event. Stream gauges may be installed in Bawdy Swamp Creek if changes in creek level appear to affect groundwater flow patterns.

5.1.2 Field Events 2a and 2b – Soil, Sediment, Surface Water and Groundwater Sampling

Solutions-IES will begin assessing offsite conditions on the adjacent NSEW property to the north of the site. Approximately seven hand auger borings will be advanced for the collection of soil and possible groundwater samples north of the facility. The proposed borings (SB-19 to SB-25) with respective sampling parameters are listed in **Table 1**. Actual site activities may involve opening a fewer or larger number of borings. They will be numbered similarly as shown in the Table. The proposed soil boring and monitor well locations are presented on **Figure 3.** The general locations of these samples are as follows:

- Approximately 7 hand auger borings with possible soil samples submitted for laboratory analysis.
- Evaluation of the existing storm water sewer system to establish flow conditions;
- One surface water sample for submittal for laboratory analysis;
- Up to 7 groundwater samples collected from temporary wells.

Soil sampling locations will be based upon the results of previous sampling conducted during 2008 and the location of underground utilities in the areas of concern. After assessing contaminant concentrations and groundwater flow conditions to the north, horizontal delineation of soil and groundwater impacts (SB-25 to SB-29) will be extended to the east side of East Preston Street (also on NSEW property) in a subsequent mobilization (Field event 2b). The exact location of the borings may be modified based upon the location of underground utilities and other features. The boring locations will be cleared by a subcontract utility locator.

Soil borings will be advanced using hand auger techniques to a total expected depth of approximately 12 ft bgs. This depth is based upon the anticipated depth to water encountered during previous investigations and in anticipation of potentially collecting groundwater samples from some of the borings through the installation of temporary 1-inch diameter wells. Soil samples will be collected for screening with Toxic Vapor Analyzer (TVA) every 2 feet from land surface to the water table at approximately 8 ft bgs. If groundwater is shallower or deeper than anticipated, then sampling will be adjusted to obtain soil samples (for screening with the TVA) to immediately above the water table.

The soil samples will be collected using a stainless steel hand auger. Upon extraction from the subsurface, the soil will be placed into plastic bowls upon plastic sheeting where a small portion of the soil sample will be placed into a resealable plastic bag and sealed to allow the soil to equilibrate at ambient temperature for at least 20 minutes. The remainder of the soil will be placed into laboratory-supplied sample bottles and place into a cooler with ice to preserve the sample until the resealable portion is screened using a TVA.

Samples recovered from each boring will be screened in the field and the portion with the highest TVA reading or other indication of impact will be submitted to the laboratory for analysis of the site COCs. During the delineation of soil impacts, if the TVA readings are similar to background readings or there are no indications of impact, then no soil samples will be submitted to the laboratory for analysis for that boring.

Soil borings will continue to be advanced with the hand auger in order to collect groundwater samples. A temporary screen (5 feet long) and riser will be set into each boring. The wells will be left in place long enough to measure the depth to water, sample groundwater and then measure the measuring point of each well relative to other reference points. Groundwater samples will be collected using low-flow sampling techniques to minimize turbidity and agitation of the groundwater. The groundwater samples will be analyzed for the site COCs.

Upon completion of sampling groundwater from each boring, the temporary well will be removed and the boring will be abandoned with bentonite clay to approximately 6-inches bgs. The top 6 inches of each boring will be completed with soil, asphalt or concrete patch, as required to match surrounding conditions.

Pace Analytical Services, Inc. in Huntersville, NC will be used for the analysis of soil and groundwater samples. The samples will be shipped to the laboratory in a cooler with ice, following proper chain-of-

custody procedures via laboratory courier or overnight carrier such as Federal Express. The samples will be extracted and analyzed by the laboratory within the designated hold time for each analysis. **Table 2** summarizes the laboratory bottles and preservatives that are anticipated to be used for each analytical sample type collected. After subsurface conditions have been evaluated for the property to the north a similar assessment process will be performed on the property east of the site across East Preston Street.

5.1.3 Field Event 3 –Permanent Monitor Well Installation

Field Event 3 encompasses the installation of up to six new groundwater monitoring wells (MW-6 through MW-11) to depths of approximately 20 ft bgs and one deep monitoring well, MW-12d, installed to an estimated depth of 50 ft bgs. One well will be placed in the anticipated background location on the west side of the property (using topography to estimate the groundwater flow direction), and the other five wells will be placed on or near the north, east and southern property boundaries to help define the extent of the groundwater plume. The deep well will be installed downgradient of the inferred source area as a Type III well, cased to isolate the surficial aquifer from the underlying aquifer. The proposed monitor well locations will be adjusted based upon the sampling results of soil (from the hand auger borings) and the temporary wells, but proposed locations are shown on **Figure 3**.

5.1.3.1 Permanent Monitor Well Installation Procedures

The shallow Type II monitoring wells will be installed using a hollow-stem auger drill rig operated by a North Carolina licensed well driller. Two-inch diameter schedule 40 polyvinyl chloride (PVC) flush threaded pipe will be used for the permanent well construction. Each well will be set through the augers and will consist of 5 feet of 0.010-inch slot PVC screen. The screens will be set totally submerged. The remainder of the well will be set with solid schedule 40 PVC riser to the land surface. A sand pack will be placed around the screen to approximately 2 feet above the screen. A bentonite pellet seal will be place above the sand pack to approximately 1 ft bgs. The remaining annular space will be grouted into place using a portland-bentonite cement mix to within 6 inches of ground surface. The wells will be completed with an 8-inch diameter, flush mounted protective cover concreted into a 2 ft by 2 ft pad. The wells will be developed by pumping and/or surging until a relatively clear discharge is observed. Purge and development water will be collected and containerized in 55-gallon steel drums.

A North Carolina Registered Surveyor will survey the locations and measuring point elevations of the borings and wells advanced during the field activities. This survey will include a plat map survey with

the utility locations, property lines and buildings as required in accordance with N.C.G.S. 130A-310.8 and NCDENR guidance.

5.1.3.2 Groundwater Sampling

Approximately one week after installation of the new monitor wells, all of the monitor wells at the site will be sampled. The proposed borings with respective sampling parameters are listed in **Table 1**. Prior to sampling each, the depth-to-water (DTW) will be measured using an electronic water level meter. Each well will be sampled using a peristaltic pump and new polyethylene tubing. The wells will be purged until accumulated sediment is removed and a relatively clear discharge is observed. Temperature, pH, conductivity, oxidation-reduction potential (ORP) and turbidity will be measured until stable readings are obtained, then the sample will be collected. Should the well go dry, it will be sampled as soon as sufficient water has recovered for sampling.

The samples will be collected into laboratory-supplied sample bottles. Upon completion of sample collection, each sample set will be placed in a cooler with ice and the samples delivered via overnight courier using chain-of-custody control procedures to the Pace Analytical Services in Huntersville, NC. The parameters to be sampled for will include VOCs and any other parameters not eliminated from the sampling program in Field Event 1 and Field Event 2.

5.2 QUALITY ASSURANCE/QUALITY CONTROL AND EQUPMENT DECONTAMINATION

During the field sampling operations, a minimum of five Quality Assurance/Quality Control (QA/QC) samples will be collected. These samples will include at least one trip blank, one field blank, one duplicate of a groundwater sample and two rinse blanks (i.e., one each of soil and groundwater sampling equipment).

Decontamination of equipment used in the investigation will be as follows:

- *Geoprobe® equipment:* Between each new boring, wash and scrub Geoprobe® rods in Liquinox™ and water solution followed by potable water rinse and deionized water rinse. Allow to drip and air-dry. Handle with new disposable nitrile gloves at each boring location. Use new MacroCore® sleeves for each soil interval.

- *Hand augers and other sampling tools:* Wash and scrub stainless steel hand augers, trowels, scoops or bowls in Liquinox™ and water solution. Follow with potable water rinse, and deionized water rinse. Allow to drip and air-dry. Handle with new disposable nitrile gloves at each boring location.

- *Groundwater sampling equipment:* All downhole probes (e.g., water level indicator) should be washed in Liquinox™ and water solution followed by potable water rinse and deionized water rinse. Allow to drip and air-dry. Handle with new disposable nitrile gloves at each boring location. All tubing used to collect groundwater samples should be new at each location.

5.3 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) soil and groundwater produced during the Phase II RI will be temporarily containerized in DOT-approved 55-gallon metal drums and stored on Site. At least one composite soil and one composite purge water sample will be collected from drums containing IDW. These samples will be analyzed for toxicity characteristic leaching procedure (TCLP) RCRA metals (barium, cadmium, chromium, lead, mercury, selenium, silver and arsenic) and VOCs. Upon characterization of the IDW, Solutions-IES will make arrangements for disposal by a certified waste handler. Eaton will be notified if any IDW is deemed to be hazardous. Based upon previous IDW produced at the site, it is anticipated that the soil will be characterized as nonhazardous, but the water may be characterized as hazardous. The characterization will be verified by the analytical data proposed above. The IDW profiles, disposal certificates and/or manifests will be included in the final report.

6.0 REPORTING

A Phase II RI Report will be prepared describing the field activities and summarizing the results of the laboratory data and any additional site history information. To the extent possible, the report will satisfy the requirements of the REC rules (15A NCAC 13C) and requirements for a Remedial Investigation Report. The report will include, at a minimum, a discussion of the boring installation, soil sampling, well installation and groundwater sampling procedures, groundwater elevations and groundwater flow direction, a summary of the analytical results, potential receptors and exposure pathways. The report shall also include any new geologic/hydrogeologic information, operational history, and conclusions and recommendations based upon the information gathered during the investigation. If the soil and groundwater impacts are adequately delineated, there will be a general evaluation of remedial alternatives and a basic comparison of the proposed remedial alternatives. Otherwise, additional investigation work will be recommended to delineate the lateral and vertical extent of contamination in each area of concern.

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