

**Waste Management Division  
PO Box 95, 29 Hazen Drive  
Concord, NH 03302**

**Type of Submittal (Check One-Most Applicable)**

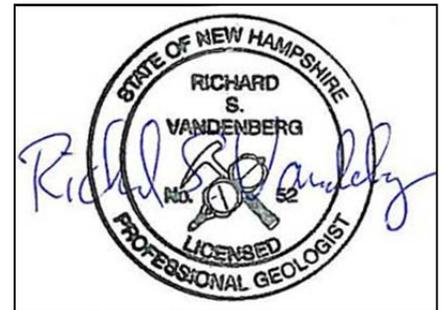
<input type="checkbox"/> Work Scope <input type="checkbox"/> Reimbursement Request	<input type="checkbox"/> Remedial Action <ul style="list-style-type: none"> <li>• Remedial Action Plan</li> <li>• Bid Plans and Specifications</li> <li>• Remedial Action Implementation Report</li> </ul>
<input type="checkbox"/> UST Facility Report <input type="checkbox"/> AST Facility Report	<input type="checkbox"/> Treatment System and POE O&M <input type="checkbox"/> Activity and Use Restriction
<input type="checkbox"/> Emergency/Initial Response Action <input type="checkbox"/> Groundwater Quality Assessment	<input type="checkbox"/> Temporary Surface Water Discharge Permit
<input type="checkbox"/> Initial Site Characterization <input type="checkbox"/> Site Investigation <ul style="list-style-type: none"> <li>• Site Investigation Report</li> <li>• Supplemental Site Investigation Report</li> <li>• GMZ Delineation</li> <li>• Source Area Investigation</li> <li>• Data Submittal</li> <li>• Annual Summary Report</li> </ul> <input checked="" type="checkbox"/> Unsolicited Phase II Environmental Site Assessment <input type="checkbox"/> Closure Documentation	<input type="checkbox"/> Groundwater Management Permit <ul style="list-style-type: none"> <li>• Permit Application</li> <li>• Renewal Application</li> <li>• Deed Recordation Documentation</li> <li>• Abutter Notification Documentation</li> <li>• Release of Recordation</li> </ul> <input type="checkbox"/> Data Submittal <input type="checkbox"/> Annual Summary Report

**SUPPLEMENTAL PHASE II ENVIRONMENTAL  
SITE ASSESSMENT**

Ernie's Auto Sales Property  
180 East Main Street  
Tilton, New Hampshire  
DES#199311019

Prepared For:  
Lakes Region Planning Commission  
103 Main Street, Suite #3  
Meredith, NH 03253  
Phone: (603) 279-8171  
Contact: Mr. Kimon Koulet

Prepared By:  
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Contact: Richard S. Vandenberg, CG, PG



October 3, 2012

**Recommended Risk Category (check one)**

<input type="checkbox"/> 1. Immediate Human Health Risk (Impacted water supply well, etc.)	<input type="checkbox"/> 4. Surface Water Impact	<input checked="" type="checkbox"/> 7. Alternate Water Available/Low Level Groundwater Contamination (<1,000 X AGQS)
<input type="checkbox"/> 2. Potential Human Health Risk (Water supply well within 1,000' or Site within SWPA)	<input type="checkbox"/> 5. No Alternate Water Available/No Existing Wells in Area	<input type="checkbox"/> 8. No AGQS Violation/No Source Remaining
<input type="checkbox"/> 3. Free Product or Source Hazard	<input type="checkbox"/> 6. Alternate Water Available/High Level Groundwater Contamination (>1,000 X AGQS)	<input type="checkbox"/> Closure Recommended

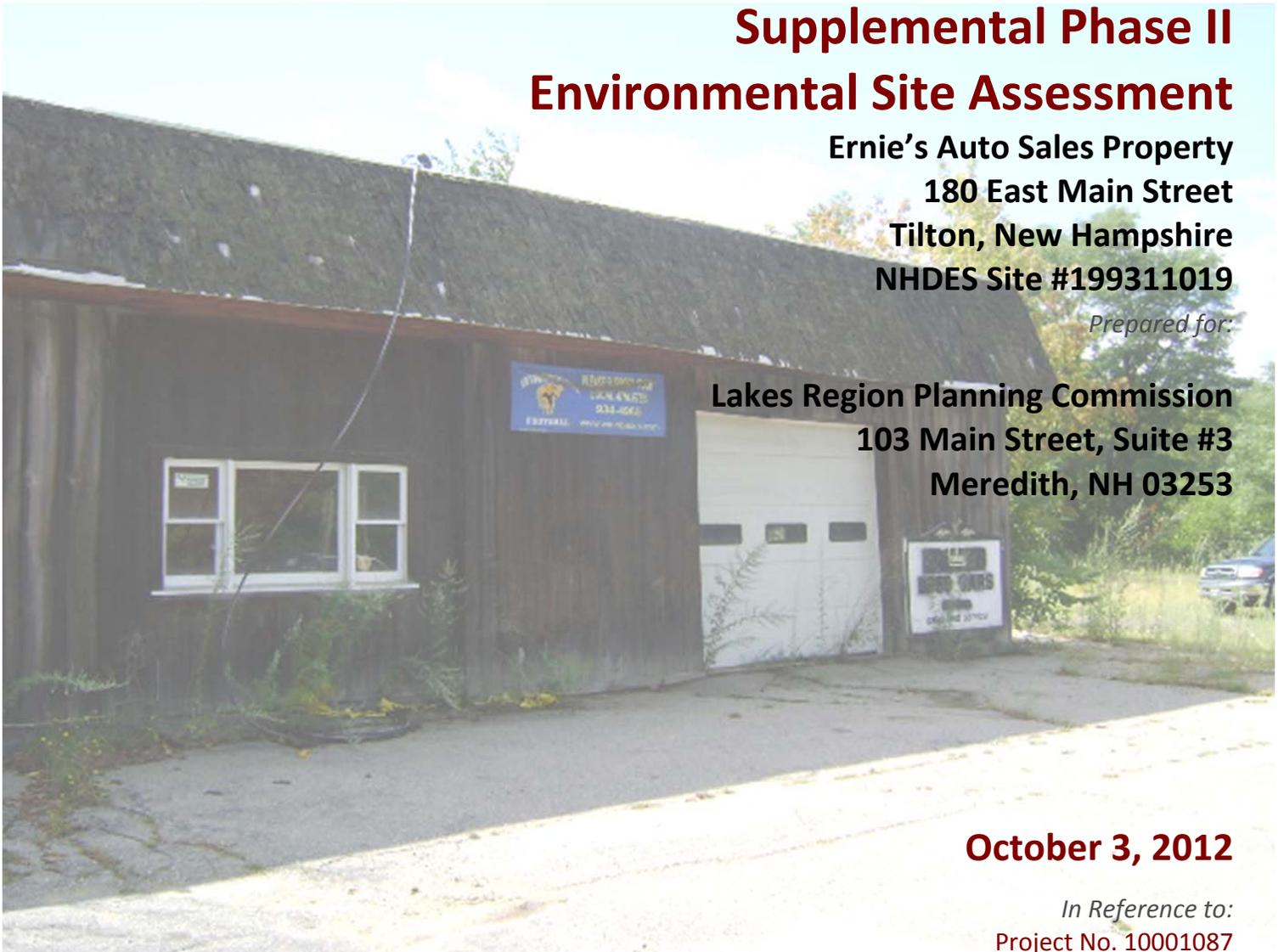


# Supplemental Phase II Environmental Site Assessment

Ernie's Auto Sales Property  
180 East Main Street  
Tilton, New Hampshire  
NHDES Site #199311019

*Prepared for:*

Lakes Region Planning Commission  
103 Main Street, Suite #3  
Meredith, NH 03253



**October 3, 2012**

*In Reference to:*  
Project No. 10001087

*Submitted by:*  
**Crede Associates, LLC**  
776 Main Street  
Westbrook, ME 04092



# CREDERE ASSOCIATES, LLC

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October 3, 2012

Mr. Kimon Koulet, Executive Director  
Lakes Region Planning Commission  
103 Main Street, Suite #3  
Meredith, New Hampshire 03253

**Subject: Supplemental Phase II Environmental Site Assessment Report  
Ernie's Auto Sales Property  
180 East Main Street, Tilton, New Hampshire**

Dear Mr. Koulet:

Attached is the Supplemental Phase II Environmental Site Assessment Report for the Ernie's Auto Sales property located at 180 East Main Street in Tilton, New Hampshire. **Sections 7 and 8** of this report present the conclusions of our work and our recommendations for future work. Copies of this report have been forwarded to the New Hampshire Department of Environmental Services (NHDES), the U.S. Environmental Protection Agency (EPA), and the Town of Tilton.

Please do not hesitate to contact me at (207) 828-1272 ext. 21 if you have any questions, comments, or require additional information regarding this investigation.

Very truly,

CREDERE ASSOCIATES, LLC

Silas Canavan, PE  
Civil/Environmental Engineer

cc: Joyce Fulweiler, Town of Tilton  
Jennifer Marts, NHDES  
Jerry Minor-Gordon, EPA



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## 1. INTRODUCTION

This report presents the results of the Supplemental Phase II Environmental Site Assessment (Supplemental Phase II ESA) activities conducted by Credere Associates, LLC (Credere) at the Ernie's Auto Sales property (the subject property) located at 180 East Main Street in Tilton, New Hampshire. Supplemental Phase II ESA activities were completed as part of the Lakes Region Planning Commission (LRPC) Brownfields Program.

The supplemental work was performed to delineate the extent of the previously identified arsenic and lead concentrations in soil at sample location SB-5 and to perform a second round of groundwater sampling to verify the presence of dissolved arsenic concentrations in groundwater.

Information contained in this document is intended to supplement the Phase II ESA previously completed by Credere dated June 2, 2011. All work was performed in accordance with the previously approved Site Specific Quality Assurance Project Plan Addendum (SSQAPP) for the subject property, which was updated via email on June 21, 2011, and Credere's June 2008 New Hampshire Generic QAPP RFA #08166 and #09036 (see **Appendix A**).



## 2. SUPPLEMENTAL PHASE II ESA FIELD ACTIVITIES

### 2.1 SOIL BORING AND SUBSURFACE SOIL SAMPLING

On July 26, 2011, Credere oversaw the advancement of seven (7) soil borings (SB-8 through SB-14). Soil borings were arranged in two tiers surrounding previously drilled soil boring SB-5 as indicated below:

- The first tier of soil borings (SB-8 through SB-11) was positioned approximately 10 feet to the south, east, north, and west of soil boring SB-5.
- The second tier of soil borings (SB-12, SB-13, and SB-14) was positioned approximately 20 feet to the south, west, and north of soil boring SB-5.

**Figure 1** shows the general location of the subject property in Tilton and **Figure 2** shows the locations of the drilled borings. **Table 1** contains a list of all exploration locations and sampling methods. Soil boring logs are included in **Appendix B**. Drilling work was performed by T&K Drilling of Troy, New Hampshire, using hollow stem augers. Soil borings were completed in accordance with SOPs HWRB-11, HWRB-15, DR#006, DR#012, DR#024, DR#025, and Credere-004.

The finished depth of each boring is included on the soil boring logs (see **Appendix B**). Each soil boring was advanced to approximately 10 to 11 feet below ground surface (bgs). During advancement, soil samples were continuously collected using the split spoon soil sampling method. Each soil sample was logged and visual and/or olfactory evidence of contamination was noted. Each sample was then field screened for arsenic and lead with an X-ray fluorescent meter (XRF).

Three samples from each first tier soil boring were selected for off-site laboratory analysis. No indicators of contamination were identified during field screening; therefore, the samples were collected from three different depths corresponding to the top, middle, and bottom of the soil boring. Soil samples collected from the second tier soil borings (SB-12, SB-13, and SB-14) were not submitted for laboratory analysis, but were held for future laboratory submission under proper chain-of-custody procedures in the event that initial laboratory work indicated that one or more of the first tier soil samples contained contamination exceeding applicable standards.

The following subsurface soil samples were collected from each boring during drilling activities on July 26, 2011, and submitted for laboratory analysis of total arsenic and lead:

- Soil boring SB-8: Samples were collected from depths of 0-2, 4-6, and 8-10 feet bgs.
- Soil boring SB-9: Samples were collected from depths of 0-2, 5-7, and 9-11 feet bgs.
- Soil boring SB-10: Samples were collected from depths of 0-2, 4-6, and 8-10 feet bgs.

- Soil boring SB-11: Samples were collected from depths of 0-2, 4-6, and 8-10 feet bgs. One duplicate sample (DUP-SB-1) of SB-11(8-10) was also collected and submitted for laboratory analysis.

## 2.2 GROUNDWATER SAMPLING

On July 26, 2011, Credere collected groundwater samples from four of the five previously installed monitoring wells (MW-1, MW-2, MW-3, MW-5), including one duplicate sample from MW-5. Prior to sampling, Credere measured the depth to groundwater in each well. Monitoring well MW-7 could not be located and, as such, was not sampled. Credere believes that the MW-7 road box may have been hit by a plow during the previous winter and destroyed.

All monitoring wells were sampled using standard low flow sampling techniques with a peristaltic pump. The wells were continuously pumped at a stable flow rate and groundwater quality measurements were collected in approximately five-minute intervals for temperature, pH, conductivity, oxidation-reduction potential, dissolved oxygen, and turbidity in accordance with SOP HWRB-9. After stabilization, samples were collected by pumping groundwater through a filter into laboratory containers. Groundwater collected from all monitoring wells was submitted for laboratory analysis of dissolved arsenic. Well depths, elevations, depths to groundwater, and groundwater table elevations are summarized in **Table 4**. Other SOPs used during the groundwater sampling field work include: Credere-001, Credere-004, DR#012, and Credere-001.



### **3. SUMMARY OF REGULATORY STANDARDS**

#### **3.1 SOIL**

Concentrations in soil samples were compared to New Hampshire Department of Environmental Services (NHDES) Soil Remediation Standards (SRS) detailed in NHDES Env-Or 600 Contaminated Site Management.

#### **3.2 GROUNDWATER**

Groundwater sample results were compared to the NHDES Ambient Groundwater Quality Standards (AGQS) detailed in NHDES Env-Or 600 Contaminated Site Management.



## 4. SUPPLEMENTAL PHASE II ESA RESULTS

The following subsections present the results of the data collected during the field work portion of this Supplemental Phase II ESA.

### 4.1 SOIL SAMPLE RESULTS

XRF readings did not indicate any elevated arsenic or lead concentrations in any of the soil samples collected from the first tier of soil borings (SB-8 through SB-11). However, arsenic was detected in boring SB-12 ranging from 10 to 15 parts per million (ppm) and in boring SB-14 at 11 ppm. Soil sample field screening results are summarized in **Table 2**.

Arsenic and lead were detected above the laboratory practical quantitation limit (PQL) in all soil samples submitted for laboratory analysis, but no concentrations exceeding the applicable NHDES SRS were noted. This indicates that contamination identified in soil boring SB-5 does not extend beyond surrounding soil borings SB-8 through SB-11. Based on this finding, samples collected from the second tier soil borings (SB-12, SB-13, and SB-14) were not submitted for laboratory analysis. The estimated extent of contaminated soil exceeding SRS is shown on **Figure 2**.

No soil from borings SB-12 or SB-14 was laboratory analyzed because in accordance with the SSQAPP no first tier samples (SB-8 through SB-11) contained SRS exceedances.

Soil sample laboratory analytical results are summarized in **Table 3**. Duplicate sample analyses are discussed in **Section 5.1** and are summarized in **Table 6**.

### 4.2 GROUNDWATER SAMPLING RESULTS

As indicated above, four (4) groundwater samples and one duplicate sample were collected from the subject property monitoring wells and submitted for laboratory analysis.

Laboratory results indicated that dissolved arsenic was detected in groundwater samples collected from monitoring wells MW-2, MW-3, and MW-5 at concentrations that exceeded the applicable NHDES AGQS. Arsenic was not detected above the laboratory PQL in the sample collected from MW-1. Groundwater analytical results for arsenic in both the December 8, 2010 and July 26, 2011, groundwater sampling events are provided in **Table 5**.

Duplicate sample analyses are discussed in **Section 5.1** and are summarized in **Table 6**.

## 5. QUALITY ANALYSIS/QUALITY CONTROL

The contracted laboratory, Absolute Resource Associates of Portsmouth, New Hampshire, provided Level II analytical data according to U.S. Environmental Protection Agency (EPA) protocols, EPA laboratory data validation guidance and the SSQAPP. The laboratories provided the following information in analytical reports:

- Data results sheets
- Method blank results
- Surrogate recoveries and acceptance limits
- Duplicate results/acceptance limits
- Spike/duplicate results/acceptance limits
- Laboratory control sample results
- Description of analytical methods and results
- Other pertinent results/limits as deemed appropriate

As outlined in the SSQAPP, at the completion of the field tasks and upon receipt of the analytical results, a data usability analysis was conducted to document the precision, bias, accuracy, representativeness, comparability, and completeness of the results. The following sections present this analysis.

### 5.1 PRECISION

Precision measures the reproducibility of measurements. The precision measurement is established using the relative percent difference (RPD) between the duplicate sample results. Relative percent differences were calculated for soil and groundwater samples where both sample and duplicate values were greater than five times (5X) the PQL of the analyte. The RPD is calculated as follows:

$$\text{RPD} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Mean of the Two Results}} \times 100$$

The following two (2) duplicate samples were collected during this Supplemental Phase II ESA:

- DUP-SB-1 (duplicate soil sample collected from soil boring SB-11 from 8 to 10 feet bgs)
- DUP-MW (duplicate groundwater sample collected from MW-5)

**Table 6** summarizes the duplicate sample results and RPDs.

Sample DUP-SB-1 was submitted for laboratory analysis of lead and arsenic. The RPDs for arsenic and lead in this sample were 30.4% and 20.6%, respectively, which were within the acceptable limit of 35%.

Sample DUP-MW was submitted for laboratory analysis of dissolved arsenic. The RPD for arsenic in this sample was 6.5%, which was within the acceptable limit of 35%.

## 5.2 BIAS

Bias is the systematic or persistent distortion of a measurement process that causes errors in one direction. Bias assessments are made using personnel, equipment, and spiking materials or reference materials as independent as possible from those used in the calibration of the measurement system. Bias assessments were based on the analysis of spiked samples so that the effect of the matrix on recovery is incorporated into the assessment. A documented spiking protocol and consistency in following that protocol are important in obtaining meaningful data quality estimates.

Matrix spike and matrix spike duplicate samples (MS/MSD) were used to assess bias as prescribed in the specified methods. Acceptable recovery values were within the recoveries specified by each of the analysis methods. Control samples for assessing bias were analyzed at a rate as specified in the analytical SOPs and specified analytical methods.

The laboratory provides quality control non-conformance reports that indicate if Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD) and/or MS/MSD had low, failing, or high recoveries, and if the sample result was affected. Likewise, the laboratory reports any compounds that had failing RPDs in the LCS/LCSD pair or the MS/MSD pair. This indicates the percent difference between the laboratory sample and its duplicate or the spike and its duplicate. According to the laboratory, unless noted in the non-conformance summary, all of the quality control criteria for these analyses were within acceptable limits. No comments were provided by the laboratory for these analyses.

## 5.3 ACCURACY

Accuracy is a statistical measurement of correctness and includes components of random error (variability due to imprecision) and systemic error. It, therefore, reflects the total error associated with a measurement. A measurement is accurate when the value reported does not differ from the true value or known concentration of the spike or standard. Analysis of performance evaluation samples are also used to provide additional information for assessing the accuracy of the analytical data being produced. Both accuracy and precision are calculated for each analytical batch, and the associated sample results are interpreted by considering these specific measurements.

The lab provides a non-conformance summary that reports if all of the quality control criteria including initial calibration, calibration verification, surrogate recovery, holding time and method accuracy/precision for analysis were within acceptable limits. According to the laboratory, unless noted in the non-conformance summary, all of the quality control criteria for these analyses were within acceptable limits. No comments were provided by the laboratory for these analyses.



#### **5.4 REPRESENTATIVENESS**

Objectives for representativeness are defined for each sampling and analysis task and are a function of the investigative objectives. Representativeness was accomplished during this project through use of standard field, sampling, and analytical procedures.

All objectives for sampling and analytical representativeness for samples that were analyzed, as specified in the SSQAPP Addendum, were met.

#### **5.5 COMPARABILITY**

Comparability is the confidence with which one data set can be compared to another data set. The objective for this QA/QC program is to produce data with the greatest possible degree of comparability. Comparability was achieved by using standard methods for sampling and analysis, reporting data in standard units, normalizing results to standard conditions and using standard and comprehensive reporting formats. Complete field documentation was used, including standardized data collection forms to support the assessment of comparability. Historical comparability shall be achieved through consistent use of methods and documentation procedures throughout the project.

#### **5.6 COMPLETENESS**

Completeness is calculated by comparing the number of samples successfully analyzed to the number of samples collected. The goal for completeness is 95 percent. The completeness for this project was 100 percent, as there were no samples that could not be analyzed due to holding time violations, samples spilled or broken, or any other reason.



## 6. UPDATED CONCEPTUAL SITE MODEL

This Supplemental Phase II ESA was designed to provide further understanding of the contaminants at the subject property and to aid in changing the subject property use from commercial to recreational. The following section is a description of the Conceptual Site Model (CSM), which incorporates information from the initial Phase II ESA and this Supplemental Phase II ESA.

### 6.1 SUBJECT PROPERTY GROUNDWATER AND HYDROGEOLOGY

Groundwater in overburden materials at the subject property was observed at depths ranging from 7.52 to 10.65 feet bgs during the July 26, 2011 sampling event. Based on groundwater elevations and the contours depicted on **Figure 3**, groundwater at the subject property generally flows to the southwest at a gradient of approximately 3%.

### 6.2 SURFACE WATER FLOW

Topography at the subject property generally slopes in two directions. The north side of the subject property slopes gently to the northwest, while the south side tends to slope radially to the south and west. Stormwater on the north side of the subject property likely follows surficial topography resulting in a northwesterly flow which terminates at a catch basin located in the northwestern corner of the subject property. This catch basin reportedly discharges via a culvert into a drainage ditch. The ultimate outfall of this drainage ditch is the Winnepesaukee River. Stormwater on the south side of the subject property generally follows the topography radially to the south and west and flows directly into the Winnepesaukee River.

### 6.3 GEOLOGICAL CHARACTERISTICS

#### 6.3.1 Surficial Geology

According to the *Geohydrology and Groundwater Quality Data of Stratified-Drift Aquifers in the Winnepesaukee River Basin, Central New Hampshire*, United States Geological Survey (USGS), Water-Resources Investigations Report 94-4150, by Joseph D. Ayotte (1997), the surficial geology at the subject property consists of glacial till over bedrock. Surficial materials observed at the subject property during soil sampling activities revealed predominantly loose to dense sand with some gravel at deeper depths.

#### 6.3.2 Bedrock Geology

According to the *Generalized Bedrock Geologic Map of New Hampshire* compiled by the USGS, the subject property is underlain primarily by metamorphic rocks of the Silurian age, consisting of aluminous schist, quartzite, calc-silicate granofels, and bimodal metavolcanic rocks. According to the USGS, the average depth to bedrock is 35-feet bgs, but can be up to 200-feet bgs in localized areas. Bedrock was not encountered during soil boring activities.



## 6.4 CONTAMINANTS OF CONCERN

The contaminants of concern discussed in this CSM are those compounds that (1) are associated with historic use of the subject property, and/or (2) were detected above applicable regulatory standards. Based on this, the contaminants of concern at the subject property include the following:

- Arsenic and lead were previously detected in subsurface soil from soil borings SB-5 at a depth of 4 to 6 feet bgs outside of the garage bay door on the west side of the building. Based on the concentrations exceeding the applicable NHDES SRS observed in SB-5 compared to the lower concentrations in surrounding soil borings SB-8 through SB-11, which do not exceed the applicable NHDES SRS, it appears that the metals detected in SB-5 are the result of subject property activities and not background conditions.
- Arsenic was also detected at concentrations exceeding the applicable NHDES AGQS in groundwater samples collected from multiple monitoring wells on the subject property (MW-2, MW-3, and MW-5), but was not detected in the most upgradient monitoring well (MW-1). Arsenic may be the result of changes in groundwater chemistry associated with the presence or former presence of petroleum releases. The arsenic concentrations exceeding the AGQS represent a potential health risk to subject property workers and future users.
- Multiple polycyclic aromatic hydrocarbon (PAH) compounds including benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene were previously detected in surficial soils across the subject property and in subsurface soils at a depth of 4 to 6 feet bgs outside of the garage bay door on the west side of the building. Additionally, the laboratory PQL for dibenzo(a,h)anthracene was higher than the SRS in subsurface soil sample SB-5(4-6); therefore, it also is conservatively considered to be a contaminant of concern. The presence of low level PAHs in all samples analyzed for PAHs suggests that they could be the result of background conditions unrelated to subject property activities. These contaminants are also carried through the conceptual model because they may still represent a potential health concern to subject property workers and future users.
- Asbestos and lead-based paint was identified in excess of applicable regulatory limits within the subject property buildings.

## 6.5 EXPOSURE PATHWAYS AND RECEPTORS

To aid in a thorough understanding of the environmental concerns present at the subject property, a graphical presentation of the identified contaminants of concern and the migration pathways to potential receptors is included as **Figure 4**. Exposure Pathways and Potential Receptors depicted on the CSM are defined below.

Exposure pathways describe how a human or environmental receptor comes into contact with contaminants which may be present at the subject property. Exposure pathways presented in the CSM include the following:



- **Inhalation:** This pathway is primarily associated with groundwater contamination within 30 feet of an occupied structure when groundwater elevation is less than 15 feet below surface grade, or when depth to groundwater is unknown. This pathway is applicable when receptors may inhale impacted media in the form of vapor.
- **Dermal Absorption:** Exposure via dermal absorption occurs when receptors are exposed to chemical concentrations present in soil, groundwater, or surface water through direct contact with the skin.
- **Active Ingestion:** The active ingestion pathway represents exposure which may occur through the active ingestion of contaminant concentrations via a drinking water supply well or through agricultural products.
- **Incidental Uptake** This pathway is applicable when receptors may incidentally ingest or inhale impacted media in the form of dust or airborne particulates.

Potential Receptors are categorized by duration of exposure and intensity of use at the Site. The receptor categories described in the CSM include the following:

- **Resident:** The residential receptor is defined by high durational exposure and high intensity usage which may occur through gardening, digging, and recreational sports. This group includes the occupants of a residential property or a residential neighborhood.
- **Commercial:** Commercial receptors are those which are present at the Site for long durations but with low intensity exposure such as indoor office workers.
- **Site Worker:** Site workers are present at the Site for short durations though intensity of use is high, such as during non-routine activities including construction or utility work. Examples include outdoor commercial workers and construction workers.
- **Visitor:** Visitors are characterized by low duration, i.e. less than two hours per day, and low intensity usage such as that which would occur during activities such as walking, shopping, and bird watching.
- **Terrestrial and Aquatic Biota:** These receptors include flora and fauna which may be exposed to contaminants in their respective land-based or aquatic



environments.

## 6.6 CONCEPTUAL SITE MODEL SUMMARY

Based on Phase II ESA results, PAHs, arsenic, and lead have been released to the environment through surficial and subsurface releases associated with previous subject property usage and/or filling with urban materials or other background conditions. Primary impacted media includes surficial soil (PAHs only), subsurface soil (PAHs, lead, and arsenic), and groundwater (arsenic only). PAHs in surficial soils have the potential to migrate through Aeolian dispersion and impact both on-site and off-site receptors. PAHs, lead, and arsenic in subsurface soils have the potential to impact site worker receptors during proposed subject property redevelopment. No evidence of the migration of PAHs and/or lead to groundwater was identified during these Phase II ESA activities.

Asbestos and lead-based paint have the potential to be released to the environment through degradation of building materials. Asbestos has the potential to affect indoor air and impact residential, commercial, site worker, and visitor receptors. Lead-based paint has the potential to affect indoor spaces and surficial soils and has the potential to migrate through pedestrian and Aeolian dispersion and stormwater runoff. Lead-based paint has the potential to impact residential, commercial, site worker, visitor, and terrestrial and aquatic biota receptors both on-site and off-site.



## 7. CONCLUSIONS

A summary of Credere's conclusions in relation to the work completed as part of this Supplemental Phase II ESA are presented below:

- Data collected from the supplemental soil sampling demonstrates that the extent of lead and arsenic contamination exceeding the SRS is limited to the area around previously drilled boring SB-5. Given the previous depth of contamination noted, the extent of contaminated soil requiring remediation is estimated at approximately 50± cubic yards (225 square feet of soil to a depth of approximately 6 feet). However, XRF field screening results revealed that some additional arsenic exceeding SRS may be present in the vicinity of soil borings SB-12 and SB-14. This may increase amount of soil requiring remediation.
- Based on the data collected, it is inconclusive whether the detected arsenic in groundwater is the result of a release of hazardous substances related to subject property activities, the result of changes in the geochemistry of groundwater related to past releases of petroleum, or are related to a background condition. The presence of arsenic in groundwater still represents a potential health risk to future subject property workers and users.



## 8. RECOMMENDATIONS

Based on observations and results of the initial and Supplemental Phase II ESAs conducted at the subject property, Credere makes the following recommendations:

- A remedial action plan should be developed to address the proper management of lead and arsenic-impacted soil identified in soil boring SB-5 because the presence of this subsurface contamination represents a risk to future subject property workers and users. In addition, the remedial action plan should also address the field screened arsenic in SB-12 and SB-14.
- Biannual groundwater sampling should also be conducted to monitor the detected arsenic concentrations in groundwater.
- It is recommended that the “background” PAHs identified at the subject property soil should be managed under a soil management plan during any future redevelopment of the subject property. The management plan should be devised to eliminate human contact with these soils.
- If the buildings are to be renovated or demolished, removal of all identified asbestos containing materials should be performed by a licensed asbestos abatement professional in accordance with all applicable state and federal regulations.
- If the buildings are to be renovated or demolished, removal activities and disposal of all identified lead-based paint should be conducted in accordance with the applicable state and federal regulations.
- If the buildings are to be renovated or demolished, the removal of identified excluded polychlorinated biphenyl (PCB) products should be conducted by qualified personnel and the selected disposal facility should be licensed to accept these materials in accordance with applicable state regulations.
- If the buildings are to be renovated, a mold survey should be conducted to identify the presence of hazardous molds within the buildings. Conversely, if the buildings are to be razed, demolition activities should be conducted in such a manner as to protect human health from potential mold hazards.



## 9. SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

The following Environmental Professionals performed this Phase II ESA in conformance with ASTM Standard Guide E 1903-97 (re-approved 2002). The following individual(s) meet the qualifications for individuals completing or overseeing all appropriate inquiries, and possess sufficient specific education, training, and experience necessary to exercise professional judgment to develop opinions and conclusions regarding the existence of environmental conditions on the subject property. Any work completed on this Supplemental Phase II ESA by an individual who is not considered an environmental professional was completed under the supervision or responsible charge of the environmental professional.



Silas Canavan, PE  
Civil/Environmental Engineer



Jedd Steinglass  
Senior Geologist



Richard S. Vandenberg, CG, PG  
Senior Geologist

## 10. LIMITATIONS

This report has been prepared as part of a contract agreement between Credere Associates, LLC and LRPC for their Brownfields program. This agreement was established in order to provide LRPC with information upon which it can rely concerning the existence or likely existence of various environmental contaminants on or adjacent to the subject property.

This report does not reflect:

1. Conditions in untested areas.
2. Variations in chemical concentrations that can occur between sample locations.
3. The total understanding of potential influences of off-site areas or historical uses that may have contributed or currently contribute to subject property contamination, particularly relating to groundwater and subsurface soil conditions. The limited evaluation of off-site contamination sources was based on available data and records.
4. The potential presence of compound sources was based on available data and records.
5. The potential presence of analytes that were not analyzed for or that may be present below minimum Practical Quantification Limits for the methods tested.
6. The conditions of groundwater and/or surface water beyond available data.
7. Variation in the subject property conditions that occurred at a time other than when the subject property inspection was completed.

In the event that any conditions different from those described herein are encountered at a later time, Credere Associates, LLC requests an opportunity to review such differences and modify the assessment and conclusions of this report. This report was prepared expressly for the purpose described. The information in this report may not be suitable for any other use without adaptation for the specific purpose intended. Any such reuse of this report, without adaptation, shall be at the sole risk and liability of the party undertaking the reuse.



## TABLES

**Table 1**.....Summary of Exploration Locations and Sampling Methods  
**Table 2**.....Summary of X-ray Fluorescent Field Screening Results for Arsenic and Lead  
**Table 3**.....Summary of Laboratory Analytical Results for Soil Samples  
**Table 4**.....Summary of Groundwater Monitoring Well Gauging and Groundwater Elevations  
**Table 5**.....Summary of Laboratory Analytical Results for Groundwater Samples  
**Table 6**.....Summary of Duplicate Sample Analysis



**TABLE 1**  
**ERNIES AUTO SALES PROPERTY**  
**180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE**  
**NHDES #199311019**

**SUMMARY OF EXPLORATION LOCATIONS AND SAMPLING METHODS**

Location Name	Sample Depth (feet)	Media Sampled	Type of Exploration	Sampling Method
SB-8	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	6-8	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-9	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	6-8	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-10	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	6-8	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-11	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	5-7	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	7-9	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	9-11	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-12	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-13	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	6-8	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
SB-14	0-2	Surficial Soil	Soil Boring	Pre-cleaned Split-Spoon
	2-4	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	4-6	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	6-8	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
	8-10	Subsurface Soil	Soil Boring	Pre-cleaned Split-Spoon
MW-1	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-2	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-3	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-5	NA	Groundwater	Monitoring Well	Low-flow Sampling
MW-7	Could Not Be Located			

Notes:

Monitoring well MW-7 could not be located during the July 26, 2011 groundwater sampling activities.

**TABLE 2  
ERNIE'S AUTO SALES PROPERTY  
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE  
NHDES #199311019**

**SUMMARY OF X-RAY FLUORESCENT FIELD SCREENING RESULTS FOR ARSENIC  
AND LEAD**

Location	Sample Depth (feet bgs)	Sample Date	NHDES Soil Remediation Standard Metal Concentration (mg/kg)	
			As	Pb
			11	400
<b>Subsurface Soil Samples</b>				
SB-8	0-2*	7/26/2011	<LOD	57
	2-4		<LOD	228
	4-6*		<LOD	44
	6-8		<LOD	59
	8-10*		<LOD	29
SB-9	0-2*	7/26/2011	<LOD	211
	2-4		<LOD	25
	5-7*		<LOD	51
	7-9		<LOD	51
	9-11*		<LOD	17
SB-10	0-2*	7/26/2011	<LOD	72
	2-4		<LOD	81
	4-6*		<LOD	50
	6-8		<LOD	240
	8-10*		<LOD	20
SB-11	0-2*	7/26/2011	<LOD	67
	2-4		<LOD	69
	4-6*		<LOD	63
	6-8		<LOD	44
	8-10*		<LOD	17
SB-12	0-2	7/26/2011	10	44
	2-4		15	83
	4-6		12	96
	6-8		<LOD	16
	8-10		<LOD	64
SB-13	0-2	7/26/2011	<LOD	45
	2-4		<LOD	77
	4-6		<LOD	38
	6-8		<LOD	68
	8-10		<LOD	17
SB-14	0-2	7/26/2011	11	88
	2-4		<LOD	39
	4-6		<LOD	108
	6-8		<LOD	74
	8-10		<LOD	20

<LOD - Concentration less than instrument level of detection

Exceeds NHDES Soil Remediation Standards

\* = Sample submitted to laboratory for analysis

bgs - below ground surface

**TABLE 3  
 ERNIE'S AUTO SALES PROPERTY  
 180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE  
 NHDES #199311019**

**SUMMARY OF LABORATORY ANALYTICAL RESULTS FOR SOIL SAMPLES**

Parameter	Regulatory Standard	Soil Sample Location, Date, and Depth (feet)												
	Soil Remediation <sup>(2)</sup> (mg/kg)	SB-5(4-6)	SB-8(0-2)	SB-8(4-6)	SB-8(8-10)	SB-9(0-2)	SB-9(5-7)	SB-9(9-11)	SB-10(0-2)	SB-10(4-6)	SB-10(8-10)	SB-11(0-2)	SB-11(4-6)	SB-11(8-10)
		12/6/2010	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011	7/26/2011
		4-6'	0-2'	4-6'	8-10'	0-2'	5-7'	9-11'	0-2'	4-6'	8-10'	0-2'	4-6'	8-10'
<b>Metals EPA Method 6010C</b>														
Arsenic	11	<b>14</b>	8.2	8.1	3.6	7.1	7.1	2.4	6.4	6.1	7.9	9.3	6.2	3.9
Lead	400	<b>750</b>	43	48	7.9	30	130	25	140	87	19	45	63	9.1

**NOTES:**

**Bold** Exceeds laboratory quantitation limit

Sampled during initial Phase II activities

Exceeds NH DES Soil Remediation Standards.

**TABLE 4  
ERNIE'S AUTO SALES PROPERTY  
180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE  
NHDES #199311019**

**SUMMARY OF GROUNDWATER MONITORING WELL GAUGING AND GROUNDWATER ELEVATIONS**

<b>MONITORING WELL ID</b>	<b>WELL LOCATION</b>	<b>WELL DEPTH (ft bgs)</b>	<b><sup>(1)</sup> WELL ELEVATION (ft)</b>	<b>GROUND ELEVATION AT WELL (ft)</b>	<b><sup>(2)</sup> DEPTH TO GROUNDWATER (ft)</b>	<b><sup>(3)</sup> CALCULATED GROUNDWATER ELEVATION (ft)</b>	<b>LNAPL THICKNESS (ft)</b>
<b>Overburden Monitoring Wells</b>							
MW-1	In area of former waste oil UST	13.2	463.34	463.86	7.90	455.44	None Observed
MW-2	In suspected dump and fill area on south side of subject property	13.40	461.97	462.29	10.65	451.32	None Observed
MW-3	In area of former fueling island	13.20	462.96	463.43	7.52	455.44	None Observed
MW-5	Downgradient of garage building	13.25	461.94	462.29	7.54	454.40	None Observed
MW-7	In suspected dump and fill area on west side of subject property	Not Found					

**Notes:**

<sup>(1)</sup> The highest point on the top of PVC casing was surveyed

<sup>(2)</sup> Groundwater levels gauged to top of PVC riser using an electronic water level meter.

<sup>(3)</sup> Groundwater Elevation = Well Elevation - Depth to Groundwater

LNAPL = Light non-aqueous phase liquid.

**TABLE 5**  
**ERNIE'S AUTO SALES PROPERTY**  
**180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE**  
**NHDES #199311019**

**SUMMARY OF LABORATORY ANALYTICAL RESULTS FOR**  
**GROUNDWATER SAMPLES**

Monitoring Well Location	Sampling Date	Metals
		Dissolved Arsenic
AGQS (µg/L)		10
MW-1	12/8/2010	ND<8
	7/26/2011	ND<8
MW-2	12/8/2010	<b>18</b>
	7/26/2011	<b>29</b>
MW-3	12/8/2010	NS
	7/26/2011	<b>15</b>
MW-5	12/8/2010	<b>19</b>
	7/26/2011	<b>15</b>
MW-7	12/8/2010	ND<8
	7/26/2011	NS

**NOTES:**

ND <8 = Not detected above quantitation limit (i.e. 8 µg/l)

NS - Not sampled

**Bold** Exceeds laboratory quantitation limit

Exceeds NHDES Ambient Groundwater Quality Standards (AGQS).

**TABLE 6**  
**ERNIE'S AUTO SALES PROPERTY**  
**180 EAST MAIN STREET - TILTON, NEW HAMPSHIRE**  
**NHDES #199311019**

**SUMMARY OF DUPLICATE SAMPLE ANALYSES**

Parameter	NHDES Threshold <sup>(1)</sup>	Quantitation Limit (mg/kg) or (ug/L)	5x Quantitation Limit	Sample	Duplicate	Relative Percent Difference
<b>Metals</b>						
<b>DUP-SB-1; duplicate of SB-11(8-10)</b>						
Arsenic	11	0.8	4.0	3.9	5.3	30.4%
Lead	400	0.8	4.0	9.1	7.4	20.6%
<b>DUP-MW; duplicate of MW-5</b>						
Dissolved Arsenic	10	8	40.0	15	16	6.5%

**NOTES:**

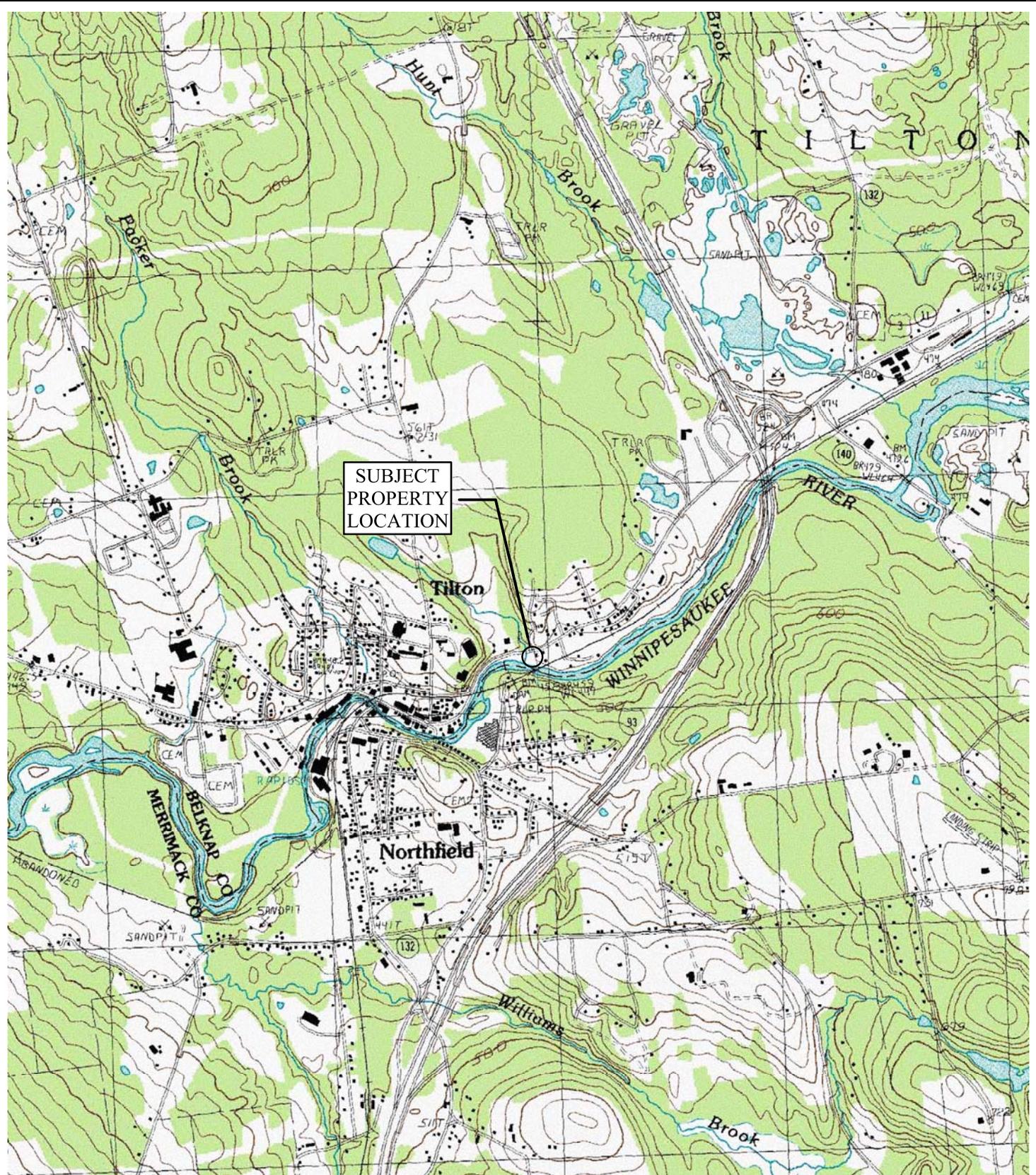
<sup>(1)</sup> New Hampshire Soil Remediation Standards Env-Or 606.19 or Env-Or 603.3 Ambient Groundwater Quality Standards.

Exceeds Relative Percent Difference quality control limit of 35% for samples as specified in the Generic QAPP

## FIGURES

<b>Figure 1</b> .....	Site Location Map
<b>Figure 2</b> .....	Sample Location Plan
<b>Figure 3</b> .....	July 26, 2011 Groundwater Contour Plan
<b>Figure 4</b> .....	Updated Conceptual Site Model





USGS 7.5 MINUTE NORTHFIELD, NH QUADRANGLE (1987)

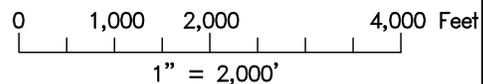
DRAWN BY: SWC	DATE: 8/30/10
CHECKED BY: RSV/JSS	PROJECT: 10001087

## FIGURE 1 - SITE LOCATION MAP



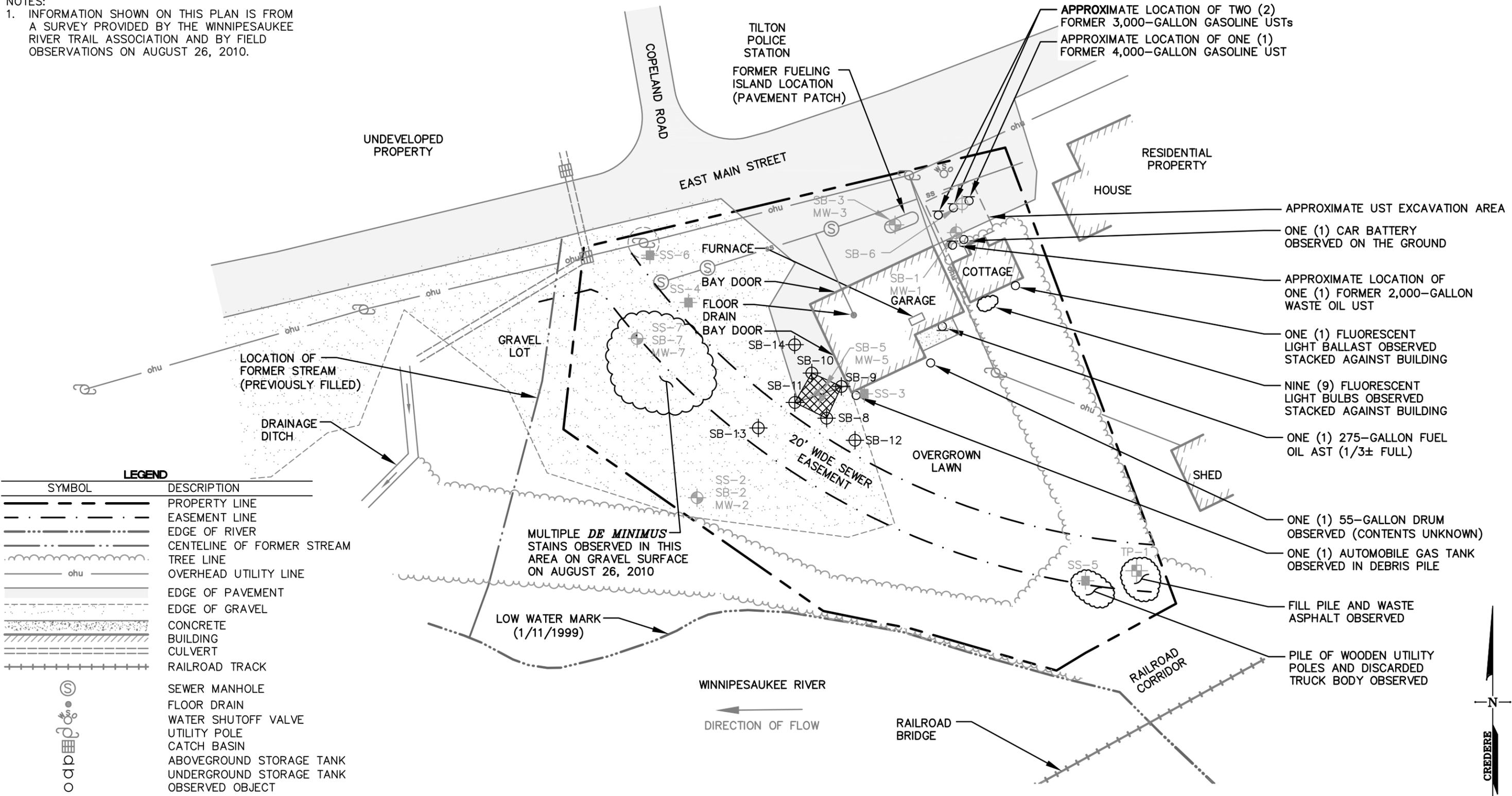
**Crede Associates, LLC**  
 776 Main Street  
 Westbrook, Maine 04092  
 Tel. (207) 828-1272  
 www.credellc.com

**ERNIE'S AUTO  
 SALES PROPERTY**  
 180 EAST MAIN STREET  
 TILTON, NH  
 NHDES #199311019



NOTES:

1. INFORMATION SHOWN ON THIS PLAN IS FROM A SURVEY PROVIDED BY THE WINNIPESAUKEE RIVER TRAIL ASSOCIATION AND BY FIELD OBSERVATIONS ON AUGUST 26, 2010.



SYMBOL	DESCRIPTION
— — — — —	PROPERTY LINE
- · - · - · -	EASEMENT LINE
- · - · - · -	EDGE OF RIVER
- · - · - · -	CENTELINE OF FORMER STREAM
~ ~ ~ ~ ~	TREE LINE
ohu	OVERHEAD UTILITY LINE
▬ ▬ ▬ ▬ ▬	EDGE OF PAVEMENT
▬ ▬ ▬ ▬ ▬	EDGE OF GRAVEL
▬ ▬ ▬ ▬ ▬	CONCRETE
▬ ▬ ▬ ▬ ▬	BUILDING
▬ ▬ ▬ ▬ ▬	CULVERT
▬ ▬ ▬ ▬ ▬	RAILROAD TRACK
⊙	SEWER MANHOLE
⊙	FLOOR DRAIN
⊙	WATER SHUTOFF VALVE
⊙	UTILITY POLE
⊙	CATCH BASIN
⊙	ABOVEGROUND STORAGE TANK
⊙	UNDERGROUND STORAGE TANK
⊙	OBSERVED OBJECT
⊙	SUPPLEMENTAL SOIL BORING LOCATION
⊙	PREVIOUS SOIL BORING LOCATION
⊙	PREVIOUS SOIL BORING/MONITORING WELL LOCATION
⊙	PREVIOUS SURFICIAL SOIL SAMPLE LOCATION
⊙	PREVIOUS TEST PIT LOCATION
▬ ▬ ▬ ▬ ▬	ESTIMATED EXTENT OF LEAD AND ARSENIC CONTAMINATED SOIL EXCEEDING SOIL REMEDIATION STANDARDS (6'± DEPTH)

MULTIPLE *DE MINIMUS* STAINS OBSERVED IN THIS AREA ON GRAVEL SURFACE ON AUGUST 26, 2010

LOW WATER MARK (1/11/1999)

WINNIPESAUKEE RIVER

DIRECTION OF FLOW

RAILROAD BRIDGE

RAILROAD CORRIDOR

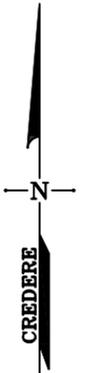
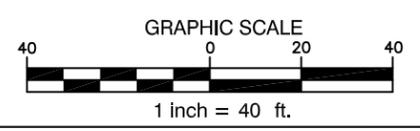
DRAWN BY: SWC      DATE: 8/22/11  
 CHECKED BY: RSV/JSS      PROJECT: 10001087



**CREDERE ASSOCIATES, LLC**  
 776 MAIN STREET  
 WESTBROOK, MAINE 04092  
 TEL: 207.828.1272  
 FAX: 207.887.1051  
 WWW.CREDERELLC.COM

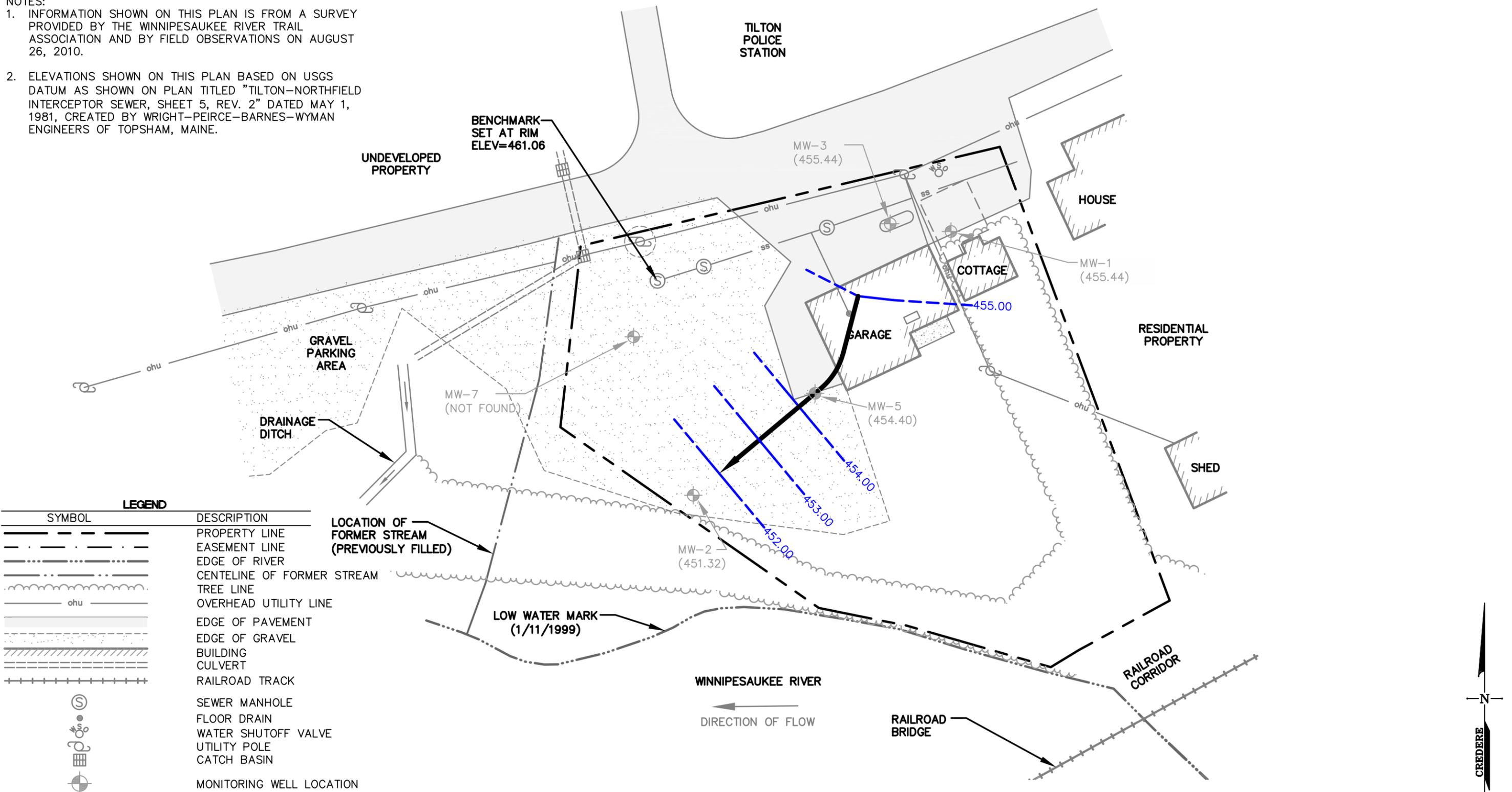
**FIGURE 2**  
**SAMPLE LOCATION PLAN**

ERNIE'S AUTO SALES PROPERTY  
 180 EAST MAIN STREET  
 TILTON, NH  
 NHDES #199311019



**NOTES:**

1. INFORMATION SHOWN ON THIS PLAN IS FROM A SURVEY PROVIDED BY THE WINNIPESAUKEE RIVER TRAIL ASSOCIATION AND BY FIELD OBSERVATIONS ON AUGUST 26, 2010.
2. ELEVATIONS SHOWN ON THIS PLAN BASED ON USGS DATUM AS SHOWN ON PLAN TITLED "TILTON-NORTHFIELD INTERCEPTOR SEWER, SHEET 5, REV. 2" DATED MAY 1, 1981, CREATED BY WRIGHT-PEIRCE-BARNES-WYMAN ENGINEERS OF TOPSHAM, MAINE.



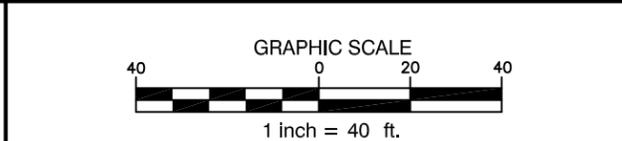
LEGEND	
SYMBOL	DESCRIPTION
	PROPERTY LINE
	EASEMENT LINE
	EDGE OF RIVER
	CENTELINE OF FORMER STREAM
	TREE LINE
	OVERHEAD UTILITY LINE
	EDGE OF PAVEMENT
	EDGE OF GRAVEL
	BUILDING
	CULVERT
	RAILROAD TRACK
	SEWER MANHOLE
	FLOOR DRAIN
	WATER SHUTOFF VALVE
	UTILITY POLE
	CATCH BASIN
	MONITORING WELL LOCATION
	CALCULATED GROUNDWATER CONTOUR LINE
	ASSUMED GROUNDWATER CONTOUR LINE
	GROUNDWATER ELEVATION
	GROUNDWATER FLOW ARROW

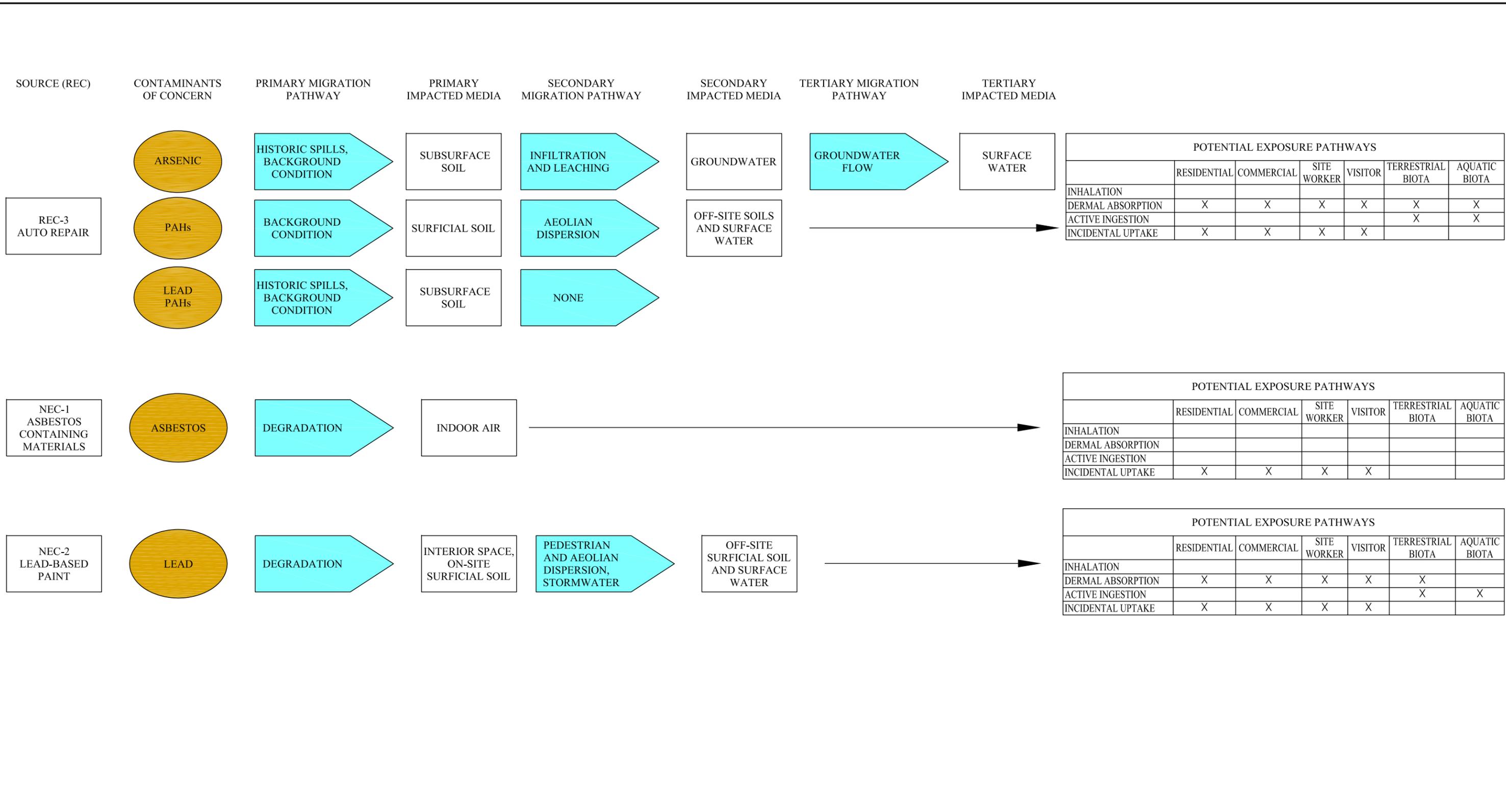
DRAWN BY: SWC      DATE: 8/22/11  
 CHECKED BY: RSV/JSS      PROJECT: 10001087

**CREDERE ASSOCIATES, LLC**  
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 WWW.CREDERELLC.COM

**FIGURE 3**  
**JULY 26, 2011 GROUNDWATER CONTOUR PLAN**

ERNIE'S AUTO SALES PROPERTY  
 180 EAST MAIN STREET  
 TILTON, NH  
 NHDES #199311019





DRAWN BY: SWC      DATE: 8/22/11  
 CHECKED BY: RSV/JSS      PROJECT: 10001087

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 FAX (207) 887-1051  
 WWW.CREDERELLC.COM

**FIGURE 4**  
**UPDATED CONCEPTUAL SITE MODEL**

ERNIE'S AUTO SALES PROPERTY  
 180 EAST MAIN STREET  
 TILTON, NH  
 NHDES #199311019

## APPENDICES

<b>Appendix A</b> .....	June 21, 2011 Updated Site Specific Quality Assurance Project Plan Addendum
<b>Appendix B</b> .....	Soil Boring Logs
<b>Appendix C</b> .....	Groundwater Sampling Logs
<b>Appendix D</b> .....	Laboratory Analytical Results



**APPENDIX A**

**JUNE 21, 2011 UPDATED SITE SPECIFIC QUALITY  
ASSURANCE PROJECT PLAN ADDENDUM**



**Subject:** RE: LRPC #BF-96111801 & NH DES SITE #1993011019 - Ernie's Auto, Tilton

**From:** Rick Vandenberg [mailto:rvandenberg@crederellc.com]  
**Sent:** Tuesday, June 21, 2011 8:15 AM  
**To:** Nora Conlon; Marts, Jennifer; Minor-Gordon.Jerry@epamail.epa.gov  
**Cc:** 'Kimon Koulet'; 'Eric Senecal'; rpatten@crederellc.com  
**Subject:** LRPC #BF-96111801 & NH DES SITE #1993011019 - Ernie's Auto, Tilton

Dear Ms. Marts, Minor-Gordon, and Ms. Conlon,

Crede Associates, LLC (Crede) is requesting permission to conduct additional assessment work at the Ernie's Auto property located at 180 East Town Farm Road in Tilton, New Hampshire in order to characterize the extent of metals contamination detected in subsurface soil during our initial Phase II ESA. The proposed additional assessment work is similar to work previously described in our December 2, 2010 approved Site-Specific Quality Assurance Project Plan (SSQAPP) Addendum No. 11 to Generic QAPP RFA #08166 and #09036 which is why this request is being made via email. As you are aware, the project is being funded through an EPA Brownfields Assessment Grant (#BF-96111801) that Lakes Region Planning Commission was awarded.

During initial Phase II ESA work, soil borings were drilled in accordance with the approved SQAPP addendum. Soil samples were collected during drilling and sent for offsite laboratory analysis. Laboratory results obtained from a soil sample collected during the drilling of boring SB-5 detected the presence of lead and arsenic in excess of their respective New Hampshire Department of Environmental Services (NHDES) Soil Remediation Standards (SRS). The extent of these metals needs to be assessed so that some remedial planning can be conducted in concert with the proposed redevelopment of the site in to a parking area and trail head for Winnepesaukee River Trails Association.

Crede proposes to drill 7 additional borings (see attached figure 1) around boring SB-5 and collect three samples (0 to 2', 4 to 6', and 8-10') from each boring for off-site analysis of lead and arsenic (up to 21 additional soil samples). During drilling, collected soil samples will be field screened with a XRF for lead and arsenic and field decisions will be made as to the final placement and depth of borings. Samples collected from proposed borings SB-8, SB-9, SB-10, and SB-11 will be analyzed first at the laboratory for lead and arsenic and the remaining samples from SB-12, SB-13, and SB-14 will be held at the laboratory. If lead and/or arsenic NHDES SRS exceedances are noted in any of the initial samples analyzed by the laboratory, then the corresponding sample outboard of that location will also be analyzed by the laboratory. The attached figure shows the locations of the proposed borings. Depending on the results of the field screening, additional borings and samples may be required, and these decisions will be made in the field. If this is the case, then any additional drilling, sampling, and laboratory will be done in accordance with this email and/or our previously approved SSQAPP addendum.

Credere also proposes to resample the existing groundwater monitor wells for arsenic. All additional sampling work would be done in accordance with the approved SSQAPP addendum.

In closing, we believe that this additional assessment work can be done within the constraints of the existing and approved SSQAPP as similar sampling and analysis methods are required that were previously specified. However, the total number of samples collected and analyzed will increase by a minimum of 21 samples. Credere hopes that the proposed additional work will be acceptable under the original SSQAPP and Brownfields funding. If you have any questions or require any additional information please do not hesitate to contact us. We look forward to hearing from you with your decision. We would like to begin this work sometime in July 2011.

Sincerely,

Rick Vandenberg  
Senior Project Manager

Richard Vandenberg, CG, PG  
Senior Project Manager  
Credere Associates, LLC  
776 Main Street  
Westbrook, Maine 04902

(207) 828-1272 ext. 15  
(603) 812-5695 (mobile)

**APPENDIX B**  
**SOIL BORING LOGS**



## Geologic Log



**Crede Associates, LLC**  
776 Main Street  
Westbrook, Maine 04092

# SB-8

### SITE INFORMATION

**Project Number/Client:**  
10001087 Ernies Auto Sales

**Site Location:**  
180 East Main Street, Tilton, NH

**DES #:** DES#199311019      **Date Start/Finish:** 7/26/2011

### WELL SPECIFICATIONS

**Well Depth (feet) from TOC:** NA

**Screen Length (feet):** NA

**TOW Elevation:** NA      **Ground Elevation:** NA

**Crede, LLC Representative:**  
Silas Canavan

**Well Material:**  
NA

### CONTRACTOR

**Drilling Contractor:**  
T&K Drilling

**Foreman:**  
Sean McGarry

**Drilling Method:**  
Hollow Stem Auger

### DRILLING EQUIPMENT

**Equipment:**  
4 1/4" ID Hollow Stem Auger

**Casing Diameter:**  
NA

**Casing Material:**  
NA

Depth	Sample Information					Soil Description and Classification (Modified Burmeister Classification System)	Equipment Installed	Depth
	Sample No.	Pen/Rec (In.)	Depth (Ft.)	Blows (/0.5')	PID (ppm) (RF=1.0)			
1	S-1*	24/16	0-2	7-10-9-14	NA	Medium dense, brown, fine to medium SAND, some coarse Gravel, dry.	N O  W E L L  I N S T A L L  E D	1
2								2
3	S-2	24/13	2-4	22-12-12-10	NA	Loose, brown, fine to medium SAND, some coarse Gravel, dry.	I N S T A L L  E D	3
4								4
5	S-3*	24/11	4-6	4-4-6-9	NA	Medium dense, dark brown, fine to coarse SAND, some coarse Gravel, dry.	I N S T A L L  E D	5
6								6
7	S-4	24/10	6-8	10-7-5-2	NA	Medium dense, greenish-grey, fine SAND, wet.	I N S T A L L  E D	7
8								8
9	S-5*	24/20	8-10	4-6-8-10	NA	End of exploration at 10'	I N S T A L L  E D	9
10								10

NA - Not applicable (only sampled for metals)

\*Sample submitted for laboratory analysis

Graphically shows approximate depth of the water table during drilling

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

## Geologic Log



**Crede Associates, LLC**  
776 Main Street  
Westbrook, Maine 04092

SB-9

SITE INFORMATION		WELL SPECIFICATIONS	
<b>Project Number/Client:</b> 10001087 Ernies Auto Sales		<b>Well Depth (feet) from TOC:</b> NA	
<b>Site Location:</b> 180 East Main Street, Tilton, NH		<b>Screen Length (feet):</b> NA	
<b>DES #:</b> DES#199311019	<b>Date Start/Finish:</b> 7/26/2011	<b>TOW Elevation:</b> NA	<b>Ground Elevation:</b> NA
<b>Crede, LLC Representative:</b> Silas Canavan		<b>Well Material:</b> NA	
CONTRACTOR		DRILLING EQUIPMENT	
<b>Drilling Contractor:</b> T&K Drilling		<b>Equipment:</b> 4 1/4" ID Hollow Stem Auger	
<b>Foreman:</b> Sean McGarry		<b>Casing Diameter:</b> NA	
<b>Drilling Method:</b> Hollow Stem Auger		<b>Casing Material:</b> NA	

Depth	Sample Information					Soil Description and Classification (Modified Burmeister Classification System)	Equipment Installed			Depth			
	Sample No.	Pen/Rec (In.)	Depth (Ft.)	Blows (/0.5')	PID (ppm) (RF=1.0)								
1	S-1*	24/15	0-2	21-25-12-22	NA	Dense, light brown, fine to coarse SAND, some coarse Gravel, dry.	N O  W E L L  I N S T A  L L E D  		1				
2						N O  W E L L  I N S T A  L L E D  			2				
3	S-2	24/7	2-4	12-14-32-20	NA			Dense, brown, fine to coarse SAND, some fine Gravel, dry.		3			
4	NS	Drilled Through (too rocky for split spoon sampling)								4			
5								N O  W E L L  I N S T A  L L E D  		5			
6	S-3*	24/4	5-7	4-4-9-9	NA				Medium dense, brown, fine to coarse SAND, some fine Gravel, dry.		6		
7									N O  W E L L  I N S T A  L L E D  		7		
8	S-4	24/10	7-9	5-3-3-3	NA					Loose, dark brown, fine to medium SAND, some fine Gravel, wet.		8	
9										N O  W E L L  I N S T A  L L E D  		9	
10	S-5*	24/18	9-11	7-10-11-19	NA						Medium dense, greenish-grey, fine SAND, wet.		10
11	End of exploration at 11'										11		

**Remarks:**

NS - No sample for interval

NA - Not applicable (only sampled for metals)

\*Sample submitted for laboratory analysis

Graphically shows approximate depth of the water table during drilling

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

## Geologic Log

 <p style="margin: 0;"><b>Crede Associates, LLC</b> 776 Main Street Westbrook, Maine 04092</p>		<b>SITE INFORMATION</b>		<b>WELL SPECIFICATIONS</b>					
		<b>Project Number/Client:</b> 10001087 Ernies Auto Sales		<b>Well Depth (feet) from TOC:</b> NA					
SB-10		<b>Site Location:</b> 180 East Main Street, Tilton, NH		<b>Screen Length (feet):</b> NA					
		<b>DES #:</b> DES#199311019 <b>Date Start/Finish:</b> 7/26/2011		<b>TOW Elevation:</b> NA <b>Ground Elevation:</b> NA					
		<b>Crede, LLC Representative:</b> Silas Canavan		<b>Well Material:</b> NA					
		<b>CONTRACTOR</b>		<b>DRILLING EQUIPMENT</b>					
		<b>Drilling Contractor:</b> T&K Drilling		<b>Equipment:</b> 4 1/4" ID Hollow Stem Auger					
		<b>Foreman:</b> Sean McGarry		<b>Casing Diameter:</b> NA					
		<b>Drilling Method:</b> Hollow Stem Auger		<b>Casing Material:</b> NA					
<b>Depth</b>	<b>Sample Information</b>					<b>Soil Description and Classification (Modified Burmeister Classification System)</b>	<b>Equipment Installed</b>		<b>Depth</b>
	<b>Sample No.</b>	<b>Pen/Rec (In.)</b>	<b>Depth (Ft.)</b>	<b>Blows (/0.5')</b>	<b>PID (ppm) (RF=1.0)</b>				
1	S-1*	24/13	0-2	9-5-13-13	NA	Medium dense, brown, fine to medium SAND, some coarse Gravel, dry.	N O  W E L L  I N S T A L L E D	1	
2	S-2	24/10	2-4	4-1-2-4	NA	Very loose, brown, fine to medium SAND, some coarse Gravel, dry.		2	
3	S-3*	24/4	4-6	5-6-7-2	NA	Medium dense, brown, fine to medium SAND, some coarse Gravel, dry.		3	
4	S-4	24/8	6-8	1-1-1-2	NA	Very loose, reddish-brown, fine to medium SAND, some coarse Gravel, damp.		4	
5	S-5*	24/23	8-10	2-2-5-10	NA	Loose, greenish-grey, fine SAND, damp.		5	
6						Medium dense, brown, fine to medium SAND, some coarse Gravel, dry.		6	
7						Very loose, reddish-brown, fine to medium SAND, some coarse Gravel, damp.		7	
8						Loose, greenish-grey, fine SAND, damp.		8	
9						Loose, greenish-grey, fine SAND, damp.		9	
10	<b>End of exploration at 10'</b>							10	
<p><b>Remarks:</b>                  NA - Not applicable (only sampled for metals)                  *Sample submitted for laboratory analysis   Graphically shows approximate depth of the water table during drilling</p>									
Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.							Page	1 of 1	
							<b>Boring No: SB-10</b>		

## Geologic Log

 <p style="text-align: center;"><b>Crede Associates, LLC</b> 776 Main Street Westbrook, Maine 04092</p>		<b>SITE INFORMATION</b>				<b>WELL SPECIFICATIONS</b>																										
		<b>Project Number/Client:</b> 10001087 Ernies Auto Sales				<b>Well Depth (feet) from TOC:</b> NA																										
SB-11		<b>Site Location:</b> 180 East Main Street, Tilton, NH				<b>Screen Length (feet):</b> NA																										
		<b>DES #:</b> DES#199311019		<b>Date Start/Finish:</b> 7/26/2011		<b>TOW Elevation:</b> NA		<b>Ground Elevation:</b> NA																								
		<b>Crede, LLC Representative:</b> Silas Canavan				<b>Well Material:</b> NA																										
		<b>CONTRACTOR</b>				<b>DRILLING EQUIPMENT</b>																										
		<b>Drilling Contractor:</b> T&K Drilling				<b>Equipment:</b> 4 1/4" ID Hollow Stem Auger																										
		<b>Foreman:</b> Sean McGarry				<b>Casing Diameter:</b> NA																										
<b>Drilling Method:</b> Hollow Stem Auger				<b>Casing Material:</b> NA																												
<b>Depth</b>	<b>Sample Information</b>					<b>Soil Description and Classification</b> (Modified Burmeister Classification System)			<b>Equipment Installed</b>		<b>Depth</b>																					
	<b>Sample No.</b>	<b>Pen/Rec (In.)</b>	<b>Depth (Ft.)</b>	<b>Blows (/0.5')</b>	<b>PID (ppm) (RF=1.0)</b>				N O  W E L L  I N S T A L L E D																							
1	S-1*	24/15	0-2	17-17-16-15	NA						1																					
2	S-2	24/13	2-4	15-8-6-6	NA						Dense, light brown, fine to coarse SAND, little coarse Gravel, dry.			2																		
3														Medium dense, light brown, fine to coarse SAND, little coarse Gravel, dry.			3															
4	S-3*	24/10	4-6	1-2-2-3	NA												Very loose, light brown, fine to coarse SAND, little coarse Gravel, dry.			4												
5																				Very loose, greenish-grey, fine SAND, wet.			5									
6	S-4	24/20	6-8	2-2-1-2	NA																		Very loose, greenish-grey, fine SAND, wet.			6						
7																										Medium dense, greenish-grey, fine SAND, wet.			7			
8	S-5*	24/18	8-10	3-4-8-12	NA																								Medium dense, greenish-grey, fine SAND, wet.			8
9																																End of exploration at 10'
10	End of exploration at 10'			10																												

**Remarks:**

NA - Not applicable (only sampled for metals)

\*Sample submitted for laboratory analysis

 Graphically shows approximate depth of the water table during drilling

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

## Geologic Log



**Crede Associates, LLC**  
776 Main Street  
Westbrook, Maine 04092

# SB-12

### SITE INFORMATION

**Project Number/Client:**  
10001087 Ernies Auto Sales

**Site Location:**  
180 East Main Street, Tilton, NH

**DES #:** DES#199311019      **Date Start/Finish:** 7/26/2011

### WELL SPECIFICATIONS

**Well Depth (feet) from TOC:** NA

**Screen Length (feet):** NA

**TOW Elevation:** NA      **Ground Elevation:** NA

**Crede, LLC Representative:**  
Silas Canavan

**Well Material:**  
NA

### CONTRACTOR

**Drilling Contractor:**  
T&K Drilling

**Foreman:**  
Sean McGarry

**Drilling Method:**  
Hollow Stem Auger

### DRILLING EQUIPMENT

**Equipment:**  
4 1/4" ID Hollow Stem Auger

**Casing Diameter:**  
NA

**Casing Material:**  
NA

Depth	Sample Information					Soil Description and Classification (Modified Burmeister Classification System)	Equipment Installed			Depth
	Sample No.	Pen/Rec (In.)	Depth (Ft.)	Blows (/0.5')	PID (ppm) (RF=1.0)					
1	S-1	24/10	0-2	19-16-10-11	NA	Medium dense, light brown, fine to coarse SAND, little coarse Gravel, dry.	<div style="display: flex; align-items: center; justify-content: center;"> <span style="writing-mode: vertical-rl; transform: rotate(180deg); font-family: monospace; font-size: 1.2em;">N O  W E L L  I N S T A L L E D</span> <div style="margin: 0 10px;"> <hr style="border: 1px solid blue; width: 100%;"/> </div> </div>	1		
2						Loose, dark brown, fine SAND, dry.		2		
3	S-2	24/3	2-4	10-6-4-2	NA			3		
4								4		
5	S-3	24/6	4-6	5-5-6-6	NA	Medium dense, dark brown, fine to medium SAND, trace crushed Brick, dry.		5		
6								6		
7	S-4	24/14	6-8	3-1-1-1	NA	Very loose, greenish-grey, fine SAND, damp.		7		
8								8		
9	S-5	24/2	8-10	3-9-19-21	NA	Medium dense, greenish-grey, fine SAND, some coarse gravel, damp.		9		
10	<b>End of exploration at 10'</b>						10			

**Remarks:**

NA - Not applicable (only sampled for metals)

No samples were submitted for laboratory analysis from this boring. Samples were collected in case laboratory analysis was necessary.

Graphically shows approximate depth of the water table during drilling

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

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Boring No:

**SB-12**

## Geologic Log



**Crede Associates, LLC**  
776 Main Street  
Westbrook, Maine 04092

# SB-13

### SITE INFORMATION

**Project Number/Client:**  
10001087 Ernies Auto Sales  
**Site Location:**  
180 East Main Street, Tilton, NH  
**DES #:** DES#199311019      **Date Start/Finish:** 7/26/2011

### WELL SPECIFICATIONS

**Well Depth (feet) from TOC:** NA  
**Screen Length (feet):** NA  
**TOW Elevation:** NA      **Ground Elevation:** NA

**Crede, LLC Representative:**  
Silas Canavan

**Well Material:**  
NA

### CONTRACTOR

**Drilling Contractor:**  
T&K Drilling  
**Foreman:**  
Sean McGarry  
**Drilling Method:**  
Hollow Stem Auger

### DRILLING EQUIPMENT

**Equipment:**  
4 1/4" ID Hollow Stem Auger  
**Casing Diameter:**  
NA  
**Casing Material:**  
NA

Depth	Sample Information					Soil Description and Classification (Modified Burmeister Classification System)	Equipment Installed			Depth
	Sample No.	Pen/Rec (In.)	Depth (Ft.)	Blows (/0.5')	PID (ppm) (RF=1.0)					
1	S-1	24/20	0-2	34-28-25-36	NA	Very dense, brown, fine to medium SAND, dry.	N O  W E L L  I N S T A L L  E D		1	
2	S-2	24/18	2-4	25-13-14-21	NA	Medium dense, light brown, fine to medium SAND, dry.			2	
3									3	
4	S-3	24/12	4-6	4-17-4-3	NA				4	
5									5	
6	S-4	24/7	6-8	2-3-6-7	NA	6				
7						7				
8	S-5	24/15	8-10	2-1-2-13	NA	8				
9						9				
10	<b>End of exploration at 10'</b>						10			

**Remarks:**

NA - Not applicable (only sampled for metals)

No samples were submitted for laboratory analysis from this boring. Samples were collected in case laboratory analysis was necessary.

Graphically shows approximate depth of the water table during drilling

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

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1 of 1

Boring No:

**SB-13**

## Geologic Log

 <p style="margin: 0;"><b>Crede Associates, LLC</b> 776 Main Street Westbrook, Maine 04092</p>		<b>SITE INFORMATION</b>		<b>WELL SPECIFICATIONS</b>					
		<b>Project Number/Client:</b> 10001087 Ernies Auto Sales		<b>Well Depth (feet) from TOC:</b> NA					
SB-14		<b>Site Location:</b> 180 East Main Street, Tilton, NH		<b>Screen Length (feet):</b> NA					
		<b>DES #:</b> DES#199311019 <b>Date Start/Finish:</b> 7/26/2011		<b>TOW Elevation:</b> NA <b>Ground Elevation:</b> NA					
		<b>Crede, LLC Representative:</b> Silas Canavan		<b>Well Material:</b> NA					
		<b>CONTRACTOR</b>		<b>DRILLING EQUIPMENT</b>					
		<b>Drilling Contractor:</b> T&K Drilling		<b>Equipment:</b> 4 1/4" ID Hollow Stem Auger					
		<b>Foreman:</b> Sean McGarry		<b>Casing Diameter:</b> NA					
		<b>Drilling Method:</b> Hollow Stem Auger		<b>Casing Material:</b> NA					
<b>Depth</b>	<b>Sample Information</b>					<b>Soil Description and Classification (Modified Burmeister Classification System)</b>	<b>Equipment Installed</b>		<b>Depth</b>
	<b>Sample No.</b>	<b>Pen/Rec (In.)</b>	<b>Depth (Ft.)</b>	<b>Blows (/0.5')</b>	<b>PID (ppm) (RF=1.0)</b>				
1	S-1	24/10	0-2	24-30-7-10	NA	Dense, brown, medium to coarse SAND, little fine Gravel, dry.	N O  W E L L  I N S T A L L E D	1	
2	S-2	24/4	2-4	7-5-8-8	NA	Medium dense, light brown, fine to medium SAND, trace of fine Gravel, dry.		2	
3	S-3	24/12	4-6	3-5-2-2	NA	Loose, light brown, fine SAND, some coarse, Gravel, dry.		3	
4	S-4	24/12	6-8	1-37-1-1	NA	Dense, dark brown, fine SAND, some silt, damp.		4	
5	S-5	24/15	8-10	2-7-14-28	NA	Medium dense, greenish-brown, fine SAND, damp.		5	
6						Dense, dark brown, fine SAND, some silt, damp.		6	
7						Medium dense, greenish-brown, fine SAND, damp.		7	
8						Dense, dark brown, fine SAND, some silt, damp.		8	
9						Medium dense, greenish-brown, fine SAND, damp.		9	
10	<b>End of exploration at 10'</b>							10	
<p><b>Remarks:</b>                  NA - Not applicable (only sampled for metals)                  No samples were submitted for laboratory analysis from this boring. Samples were collected in case laboratory analysis was necessary.   Graphically shows approximate depth of the water table during drilling</p>									
Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.							Page	1 of 1	
							<b>Boring No: SB-14</b>		

**APPENDIX C**  
**GROUNDWATER SAMPLING LOGS**









LOW FLOW SAMPLING LOG  
 CREDERE ASSOCIATES



PROJECT NAME: Ernie's Auto Sales

DATE: 7, 26, 11

PROJECT NUMBER: ~~10001087~~

LOCATION ACTIVITY START: 1203

SAMPLE LOCATION ID: MW-5

END: 1335

WELL DATA:

WELL DEPTH (ft): 13.25  MEASURED  HISTORICAL  TOP OF WELL  TOP OF CASING  FROM GRADE

WATER DEPTH (ft): 7.54  MEASURED  HISTORICAL  \_\_\_\_\_

WATER LEVEL EQUIPMENT USED:  ELECT. COND. PROBE  FLOAT ACTIVATED PROBE  PRESSURE TRANSDUCER

WELL MATERIAL:  PVC  SS  \_\_\_\_\_

WELL LOCKED:  YES  NO

PROTECTIVE CASING SECURE:  YES  NO

CONCRETE COLLAR INTACT:  YES  NO

AMBIENT AIR VOC: \_\_\_\_\_ PPM

WELL MOUTH VOC: \_\_\_\_\_ PPM

EQUIPMENT DATA:

PURGING SAMPLING:  PERISTALTIC PUMP  SUBMERSIBLE  BLADDER PUMP  HAND PUMP  DEDICATED HDPE  NEW HDPE  DEDICATED LDPE  NEW LDPE  FILTER

PH  Specific Conductivity  Dissolved Oxygen  ORP  Turbidity

METER ID: YSI  
LaMotte 2020

DECONTAMINATION FLUIDS USED:  DISTILLED WATER  DEIONIZED WATER  POTABLE WATER  TSP SOLUTION  ALCONOX SOLUTION  NONE

FIELD ANALYSIS DATA:

PUMP ON: 1205 PUMP OFF: \_\_\_\_\_ STABLE FLOW RATE (ml/min): 200  MEASURED  ESTIMATED

TIME	TEMP (°C)	pH	COND. (mS)	ORP (mV)	D.O. (mg/l)	TURBID. (ntu)	COMMENTS
1213	15.41	6.80	0.171	43.2	2.15		
1225	13.72	6.04	.422	18.5	.40	20.3	
1235	14.26	6.00	.439	-2.7	.44		
1242	14.30	5.93	.354	-5.0	.30		
1252	14.20	5.81	.352	-8.3	.22	12.1	
1300	13.35	5.75	.345	-11.7	.21		
1306	14.04	5.78	.353	-12.7	.23		
1312	14.61	5.75	.352	-13.1	.21	6.4	
1328	14.63	6.73	.354	-13.3	.22		

SAMPLE DATA:

SAMPLE BOTTLE ID	PRESERVATION	SAMPLE CONTAINER	LABORATORY ANALYSIS
TIME LOCATION	METHOD	# TYPE	
<u>1330 MW-5</u>	<u>HCl</u>	<u>1 500 mL HDPE</u>	<u>Dissolved As</u>
_____	_____	_____	_____
_____	_____	_____	_____

NOTES: Duplicate sample collected at this location

*[Signature]*  
 SAMPLER

**APPENDIX D**

**LABORATORY ANALYTICAL RESULTS**





# Absolute Resource *associates*

124 Heritage Avenue #10 Portsmouth, NH 03801

Silas Canavan  
CREDERE Associates  
776 Main Street  
Westbrook, ME 04092

PO Number: None  
Job ID: 22108  
Date Received: 7/29/11

Project: Ernie's Auto 10001087

Attached please find results for the analysis of the samples received on the date referenced above.

Unless otherwise noted in the attached report, the analyses performed met the requirements of Absolute Resource Associates' Quality Assurance Plan. The Standard Operating Procedures are based upon USEPA SW-846, USEPA Methods for Chemical Analysis of Water and Wastewater, Standard Methods for the Examination of Water and Wastewater and other recognized methodologies. The results contained in this report pertain only to the samples as indicated on the chain of custody.

Absolute Resource Associates maintains certification with the agencies listed below.

We appreciate the opportunity to provide laboratory services. If you have any questions regarding the enclosed report, please contact the laboratory and we will be glad to assist you.

Sincerely,  
Absolute Resource Associates

Sue Sylvester  
Principal, General Manager

Date of Approval: 8/11/2011  
Total number of pages: 11

## Absolute Resource Associates Certifications

New Hampshire 1732  
Maine NH903

Massachusetts M-NH902

## Sample Association Table

Field ID	Matrix	Date-Time Sampled	Lab#	Analysis
SB-8 (0-2)	Solid	7/26/2011 11:23	22108-001	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
SB-8 (4-6)	Solid	7/26/2011 11:24	22108-002	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
SB-8 (8-10)	Solid	7/26/2011 11:26	22108-003	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
SB-9 (0-2)	Solid	7/26/2011 11:30	22108-004	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
SB-9 (5-7)	Solid	7/26/2011 11:33	22108-005	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
SB-9 (9-11)	Solid	7/26/2011 11:35	22108-006	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
SB-10 (0-2)	Solid	7/26/2011 11:38	22108-007	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
SB-10 (4-6)	Solid	7/26/2011 11:40	22108-008	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
SB-10 (8-10)	Solid	7/26/2011 11:41	22108-009	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
SB-11 (0-2)	Solid	7/26/2011 11:43	22108-010	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
SB-11 (4-6)	Solid	7/26/2011 11:45	22108-011	Solid Digestion for ICP Analysis

## Sample Association Table

Field ID	Matrix	Date-Time Sampled	Lab#	Analysis
SB-11 (4-6)	Solid	7/26/2011 11:45	22108-011	Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
SB-11 (8-10)	Solid	7/26/2011 11:50	22108-012	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
DUP-SB-1	Solid	7/26/2011 0:00	22108-013	Solid Digestion for ICP Analysis Arsenic in solids by 6010 Lead in solids by 6010 Percent Dry Matter for Sample Calc by SM2540B,G
MW-1	Water	7/26/2011 9:35	22108-014	Arsenic in water by 6010
MW-2	Water	7/26/2011 12:40	22108-015	Arsenic in water by 6010
MW-3	Water	7/26/2011 11:15	22108-016	Arsenic in water by 6010
MW-5	Water	7/26/2011 13:30	22108-017	Arsenic in water by 6010
DUP-MW	Water	7/26/2011 0:00	22108-018	Arsenic in water by 6010

Project ID: Ernie's Auto 10001087

Job ID: 22108

Sample#: 22108-001

Sample ID: SB-8 (0-2)

Matrix: Solid Percent Dry: 91.4% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:23

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	8.2	0.7	ug/g	1	BJS	8/9/11	4439	8/9/11	22:00	SW3051A6010C
Lead	43	0.7	ug/g	1	BJS	8/9/11	4439	8/9/11	22:00	SW3051A6010C

Sample#: 22108-002

Sample ID: SB-8 (4-6)

Matrix: Solid Percent Dry: 89.5% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:24

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	8.1	0.8	ug/g	1	BJS	8/9/11	4439	8/9/11	22:07	SW3051A6010C
Lead	48	0.8	ug/g	1	BJS	8/9/11	4439	8/9/11	22:07	SW3051A6010C

Sample#: 22108-003

Sample ID: SB-8 (8-10)

Matrix: Solid Percent Dry: 79.4% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:26

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	3.6	0.9	ug/g	1	BJS	8/9/11	4439	8/9/11	22:15	SW3051A6010C
Lead	7.9	0.9	ug/g	1	BJS	8/9/11	4439	8/9/11	22:15	SW3051A6010C

Sample#: 22108-004

Sample ID: SB-9 (0-2)

Matrix: Solid Percent Dry: 90.8% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:30

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	7.1	0.7	ug/g	1	BJS	8/9/11	4439	8/9/11	22:22	SW3051A6010C
Lead	30	0.7	ug/g	1	BJS	8/9/11	4439	8/9/11	22:22	SW3051A6010C

Sample#: 22108-005

Sample ID: SB-9 (5-7)

Matrix: Solid Percent Dry: 92.2% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:33

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	7.1	0.7	ug/g	1	BJS	8/9/11	4439	8/9/11	22:30	SW3051A6010C
Lead	130	0.7	ug/g	1	BJS	8/9/11	4439	8/9/11	22:30	SW3051A6010C

Sample#: 22108-006

Sample ID: SB-9 (9-11)

Matrix: Solid Percent Dry: 85% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:35

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	2.4	0.8	ug/g	1	BJS	8/9/11	4439	8/9/11	22:38	SW3051A6010C
Lead	25	0.8	ug/g	1	BJS	8/9/11	4439	8/9/11	22:38	SW3051A6010C

Project ID: Ernie's Auto 10001087

Job ID: 22108

Sample#: 22108-007

Sample ID: SB-10 (0-2)

Matrix: Solid Percent Dry: 93.2% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:38

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	6.4	0.7	ug/g	1	BJS	8/9/11	4439	8/9/11	22:45	SW3051A6010C
Lead	140	0.7	ug/g	1	BJS	8/9/11	4439	8/9/11	22:45	SW3051A6010C

Sample#: 22108-008

Sample ID: SB-10 (4-6)

Matrix: Solid Percent Dry: 88.8% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:40

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	6.1	0.8	ug/g	1	BJS	8/9/11	4439	8/9/11	22:53	SW3051A6010C
Lead	87	0.8	ug/g	1	BJS	8/9/11	4439	8/9/11	22:53	SW3051A6010C

Sample#: 22108-009

Sample ID: SB-10 (8-10)

Matrix: Solid Percent Dry: 72.9% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:41

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	7.9	0.9	ug/g	1	BJS	8/9/11	4439	8/9/11	23:00	SW3051A6010C
Lead	19	0.9	ug/g	1	BJS	8/9/11	4439	8/9/11	23:00	SW3051A6010C

Sample#: 22108-010

Sample ID: SB-11 (0-2)

Matrix: Solid Percent Dry: 95.1% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:43

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	9.3	0.7	ug/g	1	BJS	8/9/11	4439	8/9/11	23:38	SW3051A6010C
Lead	45	0.7	ug/g	1	BJS	8/9/11	4439	8/9/11	23:38	SW3051A6010C

Sample#: 22108-011

Sample ID: SB-11 (4-6)

Matrix: Solid Percent Dry: 88.1% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:45

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	6.2	0.8	ug/g	1	BJS	8/9/11	4439	8/9/11	23:46	SW3051A6010C
Lead	63	0.8	ug/g	1	BJS	8/9/11	4439	8/9/11	23:46	SW3051A6010C

Sample#: 22108-012

Sample ID: SB-11 (8-10)

Matrix: Solid Percent Dry: 77% Results expressed on a dry weight basis.

Sampled: 7/26/11 11:50

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	3.9	0.8	ug/g	1	BJS	8/9/11	4439	8/9/11	23:53	SW3051A6010C
Lead	9.1	0.8	ug/g	1	BJS	8/9/11	4439	8/9/11	23:53	SW3051A6010C

Project ID: Ernie's Auto 10001087

Job ID: 22108

Sample#: 22108-013

Sample ID: DUP-SB-1

Matrix: Solid Percent Dry: 78.8% Results expressed on a dry weight basis.

Sampled: 7/26/11 0:00

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	5.3	0.8	ug/g	1	BJS	8/9/11	4439	8/10/11	0:01	SW3051A6010C
Lead	7.4	0.8	ug/g	1	BJS	8/9/11	4439	8/10/11	0:01	SW3051A6010C

Sample#: 22108-014

Sample ID: MW-1

Matrix: Water

Sampled: 7/26/11 9:35

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	< 0.008	0.008	mg/L	1	BJS		1101578	7/29/11	15:21	SW3005A6010C

Sample#: 22108-015

Sample ID: MW-2

Matrix: Water

Sampled: 7/26/11 12:40

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	0.029	0.008	mg/L	1	BJS		1101578	7/29/11	15:26	SW3005A6010C

Sample#: 22108-016

Sample ID: MW-3

Matrix: Water

Sampled: 7/26/11 11:15

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	0.015	0.008	mg/L	1	BJS		1101578	7/29/11	15:34	SW3005A6010C

Sample#: 22108-017

Sample ID: MW-5

Matrix: Water

Sampled: 7/26/11 13:30

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	0.015	0.008	mg/L	1	BJS		1101578	7/29/11	15:41	SW3005A6010C

Sample#: 22108-018

Sample ID: DUP-MW

Matrix: Water

Sampled: 7/26/11 0:00

Parameter	Result	Quant		Instr Dil'n		Prep		Analysis		
		Limit	Units	Factor	Analyst	Date	Batch	Date	Time	Reference
Arsenic	0.016	0.008	mg/L	1	BJS		1101578	7/29/11	15:48	SW3005A6010C

# Quality Control Report



124 Heritage Avenue Unit 10  
Portsmouth, NH 03801  
[www.absoluteresourceassociates.com](http://www.absoluteresourceassociates.com)



**Case Narrative**

**Lab # 22108**

**Sample Receiving and Chain of Custody Discrepancies**

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Samples were received in acceptable condition, at 3 degrees C, on ice, and in accordance with sample handling, preservation and integrity guidelines.

**Calibration**

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No exceptions noted.

**Method Blank**

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No exceptions noted.

**Surrogate Recoveries**

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Not applicable.

**Laboratory Control Sample Results**

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No exceptions noted.

**Matrix Spike/Matrix Spike Duplicate/Duplicate Results**

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Not requested for this project.

**Other**

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Reporting Limits: Dilutions performed during the analysis are noted on the result pages.

No other exceptions noted.

## - QC Report -

Method	QC ID	Parameter	Associated Sample	Result	Units	Amt Added	%R	Limits	RPD	RPD Limit
SW3005A6010C	BLK1101578	Arsenic		< 0.008	mg/L					
SW3005A6010C	LCS1101578	Arsenic		0.50	mg/L	0.5	101	80 120		
SW3051A6010C	BLK4439	Arsenic		< 0.50	ug/g					
		Lead		< 0.50	ug/g					
SW3051A6010C	CRM4439	Arsenic		410	ug/g	400		292 508		
		Lead		5100	ug/g	5100		3753 6469		
SW3051A6010C	CRMD4439	Arsenic		420	ug/g	400		292 508	2	20
		Lead		5200	ug/g	5100		3753 6469	3	20
SW3051A6010C	DUP4439	Arsenic	22166-004	4.1	ug/g				3	35
		Lead	22166-004	5.2	ug/g				18	35

# Absolute Resource Associates



124 Heritage Avenue #10  
 Portsmouth, NH 03801  
 603-436-2001  
 absoluteresourceassociates.com

## CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

221108

Company Name: **Credere Associates**

Company Address: **776 Main St, Westbrook, ME 04092**

Report To: **Silas Canavan**

Phone #: **207-828-1272 x21**

Invoice To: **Same**

Project Name: **Ernie's Act**

Project #: **10001087**

Project Location: **NH MA ME VT**

Protocol: **RCRA SDWA NPDES MGP NHDES OTHER**

Reporting Limits: **GW-1 S-1**

Quote # **Brewsterfield**

Lab Sample ID (Lab Use Only)	Field ID	# CONTAINERS	Matrix			Preservation Method						Sampling		
			WATER	SOLID	OTHER	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER (Specify)	DATE	TIME	SAMPLER
220801	SB-8(0-2)	1	X								7/26/11	1123	SL	
02	SB-8(4-6)											1124		
03	SB-8(8-10)											1126		
04	SB-9(0-2)											1130		
05	SB-9(5-7)											1133		
06	SB-9(8-11)											1135		
07	SB-10(0-2)											1138		
08	SB-10(4-6)											1140		
09	SB-10(8-10)											1141		
10	SB-11(0-2)											1143		
11	SB-11(4-6)											1145		

<input type="checkbox"/> VOC 8260	<input type="checkbox"/> VOC 8260 NHDES	<input type="checkbox"/> VOC 8260 MADEP
<input type="checkbox"/> VOC 624	<input type="checkbox"/> VOC BTEX	<input type="checkbox"/> MIBE, only
<input type="checkbox"/> VOC 8021VT	<input type="checkbox"/> VPH MADEP	<input type="checkbox"/> MEGRO
<input type="checkbox"/> GRO 8015	<input type="checkbox"/> VOC 524.2	<input type="checkbox"/> VOC 524.2 NH List
<input type="checkbox"/> Gases-List:	<input type="checkbox"/> TPH	<input type="checkbox"/> DRO 8015
<input type="checkbox"/> MEDRO	<input type="checkbox"/> EPH MADEP	<input type="checkbox"/> TPH Fingerprint
<input type="checkbox"/> 8270PAH	<input type="checkbox"/> 8270ABN	<input type="checkbox"/> 625
<input type="checkbox"/> EDB 504.1	<input type="checkbox"/> 8082 PCB	<input type="checkbox"/> 8081 Pesticides
<input type="checkbox"/> 608 Pest/PCB	<input type="checkbox"/> O&G 1664	<input type="checkbox"/> Mineral O&G SM5520F
<input type="checkbox"/> pH	<input type="checkbox"/> BOD	<input type="checkbox"/> Conductivity
<input type="checkbox"/> Turbidity	<input type="checkbox"/> TSS	<input type="checkbox"/> TDS
<input type="checkbox"/> TS	<input type="checkbox"/> TVS	<input type="checkbox"/> Alkalinity
<input type="checkbox"/> RCRA Metals	<input type="checkbox"/> Priority Pollutant Metals	<input type="checkbox"/> TAL Metals
<input checked="" type="checkbox"/> Total Metals-list: <b>Pb, As</b>	<input type="checkbox"/> Dissolved Metals-list:	
<input type="checkbox"/> Ammonia	<input type="checkbox"/> COD	<input type="checkbox"/> TKN
<input type="checkbox"/> TN	<input type="checkbox"/> TON	
<input type="checkbox"/> T-Phosphorus	<input type="checkbox"/> Phenols	<input type="checkbox"/> Bacteria P/A
<input type="checkbox"/> Bacteria MPN	<input type="checkbox"/> Cyanide	<input type="checkbox"/> Sulfide
<input type="checkbox"/> Nitrate + Nitrite	<input type="checkbox"/> Ortho P	
<input type="checkbox"/> Nitrate	<input type="checkbox"/> Nitrite	<input type="checkbox"/> Chloride
<input type="checkbox"/> Sulfate	<input type="checkbox"/> Bromide	<input type="checkbox"/> Fluoride
<input type="checkbox"/> Corrosivity	<input type="checkbox"/> Reactive CN	<input type="checkbox"/> Reactive S-
<input type="checkbox"/> Ignitibility/FP	<input type="checkbox"/> TCLP Metals	<input type="checkbox"/> TCLP VOC
<input type="checkbox"/> TCLP SVOC	<input type="checkbox"/> TCLP Pesticide	
<input type="checkbox"/> Subcontract: <input type="checkbox"/> TOC	<input type="checkbox"/> Grain Size	<input type="checkbox"/> TCLP Herbicides

**YAT REQUESTED**  
 Priority (24 hr)\*   
 Expedited (48 hr)\*   
 Standard (10 Business Days)   
 \*Date Needed \_\_\_\_\_

See absoluteresourceassociates.com for sample acceptance policy and current accreditation lists.

**REPORTING INSTRUCTIONS**  
 HARD COPY REQUIRED  FAX (FAX#) \_\_\_\_\_  
 OTHER (specify) \_\_\_\_\_

**SPECIAL INSTRUCTIONS**  
 A PDF (e-mail address) **Scavanan@credencell.com**

**RECEIVED ON ICE**  YES  NO  
 TEMPERATURE \_\_\_\_\_ °C

CUSTODY RECORD		Relinquished by: <b>[Signature]</b>		Date: <b>7/26/11</b> Time: <b>1724</b>		Received by: <b>[Signature]</b>		Date: <b>7/26/11</b> Time: <b>1724</b>	
Relinquished by: <b>[Signature]</b>		Date: <b>7/29/11</b>		Time: <b>0915</b>		Received by: <b>[Signature]</b>		Date: <b>7/29/11</b> Time: <b>0915</b>	
Relinquished by: <b>[Signature]</b>		Date: _____		Time: _____		Received by: <b>[Signature]</b>		Date: <b>7/29/11</b> Time: <b>0915</b>	



124 Heritage Avenue #10  
 Portsmouth, NH 03801  
 603-436-2001  
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# Absolute Resource Associates

## CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

221108

Company Name: Credent Associates

Company Address: 776 Main St Westbrook, ME 04092

Report To: Silas Canavan

Phone #: 207-828-1272 x21

Invoice To: Silva

Project Name: Guires Auto

Project #: 10001087

Project Location: NH MA ME VT

Protocol: RCRA SDWA NPDES MGP NHDES OTHER

Reporting: QAPP GW-1 S-1

Quote #: 30000000

PO #

Lab Sample ID (Lab Use only)	Field ID	# CONTAINERS	Matrix			Preservation Method							Sampling		
			WATER	SOLID	OTHER	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER (Specify)	DATE	TIME	SAMPLER	
12	SB-11 (8-10)	1		X									7/26/11	1150	SC
13	DUP-SB-1			X									7/26/11		SC
14	MW-1												7/26/11	0935	BE
15	MW-2													1240	BE
16	MW-3													1115	BE
17	MW-5													1330	SC
18	DUP-MW														SC

- VOC 8260  VOC 8260 NHDES  VOC 8260 MADEP
- VOC 624  VOC BTEX  MIBE, only  VOC 8021VT
- VPH MADEP  MEGRO  GRO 8015
- VOC 524.2  VOC 524.2 NH List  Gases-List:
- TPH  DRO 8015  MEDRO  EPH MADEP  TPH Fingerprint
- 8270PAH  8270ABN  625  EDB 504.1
- 8082 PCB  8081 Pesticides  608 Pest/PCB
- O&G 1664  Mineral O&G SM5520F
- pH  BOD  Conductivity  Turbidity
- TSS  TDS  TS  TVS  Alkalinity
- RCRA Metals  Priority Pollutant Metals  TAL Metals
- Total Metals-list: Pb, As
- Dissolved Metals-list: As
- Ammonia  COD  TKN  TN  TON
- T-Phosphorus  Phenols  Bacteria P/A  Bacteria MPN
- Cyanide  Sulfide  Nitrate + Nitrite  Ortho P
- Nitrate  Nitrite  Chloride  Sulfate  Bromide  Fluoride
- Corrosivity  Reactive CN  Reactive S-  Ignitibility/FP
- TCLP Metals  TCLP VOC  TCLP SVOC  TCLP Pesticide
- Subcontract:  TOC  Grain Size  TCLP Herbicides

**TAT REQUESTED**  
 Priority (24 hr)\*  
 Expedited (48 hr)\*  
 Standard (10 Business Days)

**SPECIAL INSTRUCTIONS**

See absoluteresourceassociates.com for sample acceptance policy and current accreditation lists.

REPORTING INSTRUCTIONS  
 PDF (e-mail address) scavanan@credentllc.com  
 HARD COPY REQUIRED  FAX (FAX#)  
 OTHER (specify)

REINQUISHED BY: [Signature] Date: 7/26/11 Time: 1724

RECEIVED ON ICE  YES  NO  
 TEMPERATURE \_\_\_\_\_ °C

REINQUISHED BY: [Signature] Date: 7/29/11 Time: 0915

RECEIVED BY: [Signature] Date: 7/29/11 Time: 0915

REINQUISHED BY: [Signature] Date: 7/29/11 Time: 0915

RECEIVED BY: [Signature] Date: 7/29/11 Time: 0915