1. TITLE AND APPROVAL PAGE

DRAFT SITE-SPECIFIC QUALITY ASSURANCE PROJECT PLAN (SSQAPP)
RFA #19043

Property:
Prime Tanning Facility
Lots 130 and 133
Berwick, Maine
EPA Brownfields Cleanup Grant # BF-00A00197 and BF-00A00445

Prepared By:
Credere Associates, LLC
776 Main Street, Westbrook, Maine 04092
(207) 828-1272

June 18, 2019

Below is a listing of the names, titles, signatures, and signature dates of officials approving this Site-Specific Quality Assurance Project Plan (SSQAPP):

Frank Gardner EPA Brownfields Project Officer	Date
Nora Conlon, Ph. D. EPA Quality Assurance Chemist	Date
Richard Currie Maine DEP Project Manager	Date
Stephen Eldridge Town of Berwick, Town Manager, Grantee	Date
Richard Vandenberg, CG, PG Credere Associates, LLC, Project Manager/Quality Control Manager	Date
Rip Patten, PE, LSP, LEED AP Credere Associates, LLC QC, Program Manager	Date

TABLE OF CONTENTS

1. TITLE AND APPROVAL PAGE 1

2. INTRODUCTION 4

3. PROBLEM DEFINITION 5

3.1 Site Description 5
3.2 Site History 5
3.3 Prior Investigations 6

4. PROJECT DESCRIPTION & TIMELINE 9

4.1 Redevelopment Scenario 9
4.2 Cleanup Strategies 9
4.3 Proposed Project Timeline 10

5. UPDATED CONCEPTUAL SITE MODEL 11

5.1 Site Description 11
5.2 Site History 11
5.3 Physical Setting 11
5.4 Source Areas and COPCs 12
5.5 Nature and Extent of Contamination 12
5.6 Exposure Pathways and Potential Receptors 14
5.7 Conceptual Site Model Summary 15

6. SAMPLE DESIGN 17

6.1 Objectives 17
6.2 Asbestos Sampling 17
6.3 Indoor Air Sampling 18
6.4 Soil Boring Advancement and Soil Sampling 18
6.5 Groundwater Sampling 19
6.6 Surface Soil Sampling 19
6.7 Post-Excavation Confirmatory Soil Sampling 20
6.8 Additional Sediment Sampling 21

7. SAMPLING AND ANALYTICAL METHOD REQUIREMENTS 22

7.1 Asbestos Sampling 22
7.2 Indoor Air Sampling 22
7.3 Soil Boring Advancement and Soil Sampling 22
7.4 Groundwater Sampling 23
7.5 Surface Soil Sampling 24
7.6 Post-Excavation Confirmatory Soil Sampling 24
7.7 Additional Sediment Sampling 25

8. REGULATORY STANDARDS 26

8.1 Asbestos Sampling.....26
8.2 Indoor Air Sampling 26
8.3 Soil Sampling.....26
8.4 Groundwater Sampling 26
8.5 Sediment Sampling 26

FIGURES

Figure 1 ..... Site Location Plan
Figure 2 .....Detailed Site Plan
Figure 3 ..... Project Organization Flow Chart

TABLES

Table 1..... Sample Reference Table
Table 2.....Standard Operating Procedure (SOP) Reference Table

APPENDICES

Appendix A.....Analytical Sensitivity and Project Criteria Tables

2. INTRODUCTION

Credere Associates, LLC (Credere) was retained by the Town of Berwick to prepare this Site-Specific Quality Assurance Project Plan (SSQAPP) to document sampling activities that will be implemented during the upcoming summer 2019 cleanup of Prime Tanning Lots 130 and 133 located at 35 and 34 Sullivan Street in the Town of Berwick, Maine (Site). This work is being completed to satisfy the Maine Department of Environmental Protection (DEP) and United States (U.S.) Environmental Protection Agency (EPA) approved October 31, 2018 Analysis of Brownfields Cleanup Alternatives and Remedial Action Plan (ABCA/RAP) and the June 18, 2019 Draft ABCA/RAP Amendment #1 which details important proposed modifications to the cleanup plan. The Town of Berwick is using funding from two U.S. EPA Brownfield Cleanup Grants (BF-00A00197 and BF-00A00445) to conduct these cleanup activities.

This SSQAPP presents the following information:

- The problem definition including a site description and summary of background information for the Site
- Project description and timeline
- A revised conceptual Site model (CSM)
- The cleanup objectives and proposed sampling design, techniques, and rationale
- Site-specific field sampling and analytical methodology
- Regulatory standards applicable to the Site for each proposed sampling media

This SSQAPP was prepared to be used in concert with Credere's Generic Quality Assurance Project Plan (QAPP) referenced under EPA Quality Assurance Tracking: Request for Assistance (RFA) #19043, dated May 2019, that was prepared for all of Credere's EPA Brownfields work. The quality assurance and quality control (QA/QC) procedures outlined in Credere's Generic QAPP will be followed for this investigation program including sample collection, handling, and analysis of samples; chain-of-custody; and data management, documentation, validation and usability assessment.

Figure 1 shows the general location of the Site in Berwick, Maine; **Figure 2** presents pertinent Site features; and **Figure 3** is Credere's Project Organization Flow Chart for the project team.

3. PROBLEM DEFINITION

3.1 SITE DESCRIPTION

The Site is comprised of two parcels, Lots 130 and 133, totaling 3.48 acres and is located within a mixed residential and commercial area of Berwick.

Lot 130 is located at 35 Sullivan Street and contains 0.68 acres of land with one 14,341-square foot Site building (referred to as the Blue Sort Building). The Blue Sort Building is currently used as storage space and heated using fuel oil-fired air handlers. Water service is provided publicly by the Berwick Water Department and wastewater services are provided by the Berwick Sewer Commission. Electrical service is provided by Central Maine Power.

Lot 133 is located at 34 Sullivan Street and contains 2.8 acres of land and is developed as a parking lot. The parking lot occupies the southern portion of Lot 133 and was formerly used for Prime Tanning employee parking. The remainder of the Site is comprised of dense vegetation. There are no water/sewer connections serving this lot, but a temporary electric service drop is evident along the western property boundary (along Sullivan Street).

The main former Prime Tanning Facility and vacant Prime Tanning Lot 95 adjoin the Site to the south.

3.2 SITE HISTORY

The Town of Berwick acquired the Site in 2014, along with the other Prime Tanning Facility parcels in a public-private partnership with the Funds of Jupiter (FOJ; Prime Tanning primary mortgage holder). The Prime Tanning facility has a long history of industrial use including as a tannery dating back to the late 1800's. This history has been documented in numerous other environmental reports. However, excerpts of the history as they relate to the two Site parcels are provided below:

Lot 130

Manufacturing operations began on Lot 130 as early as 1887 and included shoe manufacturing, planing mill operations, and building materials and lumber supplier until at least 1965. The former buildings on this parcel were removed and the current Site building was constructed sometime before 1974, presumably at the same time or shortly after Prime Tanning acquired the property that same year. The Blue Sort Building was used for storage related to the main Prime Tanning Facility. The Blue Sort Building also housed hide shaving operations until the Prime Tanning facility closed in 2008. Since that time the Blue Sort Building has only been intermittently used for the storage of lawn care equipment.

Lot 133

Lot 133 previously contained residential buildings and stables beginning in at least 1887 until circa 1965. By 1974 the lot was acquired and operated by Prime Tanning and was principally used as an employee parking lot. The parking lot was paved in 1989 and remains in deteriorated condition

to present day. A garage/shed structure was reportedly located in the northwestern portion of the lot circa 1979 until approximately 2004. Records also indicate that from at least 1981 to 1984, an office building was also located on the Site and used by Prime Tanning.

3.3 PRIOR INVESTIGATIONS

Summaries of previously completed work are included in Credere's October 31, 2018, SSQAPP Since the October 31, 2018, SSQAPP was completed, Credere completed additional characterization work in December 2018 on Lots 130 and 133 to support the remedial design work and in consideration of the following objectives:

1) Confirm the presence and extent of hazardous building materials in the Blue Sort Building
2) Characterize the sub-slab soil vapor beneath the Blue Sort Building to assess if volatile organic compounds (VOCs) remain present beneath the slab
3) Characterize soil intended for reuse onsite.

Results of this December 2018 additional characterization are summarized below and organized by contaminant.

Asbestos Sampling

Nine materials were sampled for analysis of asbestos during the additional characterization conducted in December 2018. Results indicated the following materials to be asbestos-containing materials (ACMs):

- Black roofing cement
- Silver roofing paint
- Interior spray-on insulation (+/- 14,000 square feet)

The identified black roofing cement and silver roofing paint are not included within the scope of this SSQAPP.

Lead Paint Screening

The following lead-containing paint (concentration above 0.0 milligrams per square centimeter [mg/cm^2]) were identified:

- Green paint on the hallway leading to the bathroom
- White, pale green, and yellow exterior paint

Polychlorinated Biphenyl (PCB)-Containing Building Material Sampling

Four building materials and the building floor concrete were sampled for analysis of PCBs as part of the additional characterization conducted by Credere in December 2018. Results indicated the sampled materials PCB concentrations were below the laboratory reporting limits, which ranged from 0.0187 to 0.201 milligrams per kilogram (mg/kg).

Sub-Slab Soil Vapor Screening & Sub-Slab Air Sampling

Sixteen (16) sub-slab soil gas screening points were installed for a total of 15 screening locations with a photoionization detector (PID; one location could not be completed) during the December 2018 additional characterization. The following table summarizes the detected concentrations of VOCs:

Screening Location	Screening ID	Concrete Thickness (inches)	Screening Detection (ppm_v)
Loading Dock	CA-SG-1	14.16	10.80
	CA-SG-2	13.32	39.78
Room 101	CA-SG-3	6.72	3.537
	CA-SG-4	9.00	190.1
	CA-SG-5	Not completed	
	CA-SG-6	6.84	1.600
	CA-SG-7	6.84	32.00
	CA-SG-8	7.80	2.110
	CA-SG-9	9.12	10.71
	CA-SG-10	6.60	2.500
Room 102	CA-SG-11	9.60	11.73
	CA-SG-12	9.24	27.71
	CA-SG-13	8.40	4.257
	CA-SG-14	10.80	16.87
	CA-SG-15	9.12	9.058
	CA-SG-16	10.92	3.987

ppm_v – parts per million by volume

Based on these results, one sub-slab soil gas sample was collected from CA-SG-4 for laboratory analysis of VOCs by EPA Method TO-15. Detected VOC concentrations are below Maine DEP indoor air Remedial Action Guidelines (RAGs) when the 0.03 attenuation factor is applied to the data (per Section 6.4.2 of the October 19, 2018, Maine DEP RAGs). However, these data indicate the chlorinated VOC (CVOC) trichloroethene (TCE) and other VOCs are present below the Blue Sort Building slab. A clear source was not identified, and the detections are immediately adjacent to a water line penetration through the foundation. However, the floor will need to be repaired/sealed to protect future occupants of the building. Additionally, some additional characterization work is needed to evaluate potential vapor and groundwater migration to adjacent structures.

Surface Soil Sampling

As part of the additional characterization conducted by Credere in December 2018, 17 surface soil samples (0-2 feet) were collected across both Site parcels to supplement previous data and plan for cleanup. Samples were laboratory analyzed for polycyclic aromatic hydrocarbons (PAHs) and lead.

Results indicated only one surface soil sample (CA-SS-12 located on Lot 133) contained concentrations of PAHs in exceedance of applicable Maine DEP RAG exposure scenarios. Three

surface soil samples (CA-SS-9, CA-SS-10, and CA-SS-12; all on Lot 133) contained concentrations of lead in exceedance of one or more exposure criteria of the Maine DEP RAGs.

Sediment Sampling

Sediment samples were collected as a part of the December 2018 additional characterization work from the unnamed brook traversing along the eastern Site boundary of Lot 133 towards the main Prime Tanning Facility parcel. The laboratory data was rejected due to hold time exceedances of freezing low-level analysis containers within 48 hours. However, PAHs and metals were identified in all samples preliminarily exceeding National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs) for Inorganics in Sediment. Results were below the Maine DEP sediment RAGs. These impacts appear to be from offsite upstream of the Site as concentrations upstream contain similar or higher concentrations to those downstream. Additional, samples will be collected to confirm these results at the conclusion of cleanup work.

4. PROJECT DESCRIPTION & TIMELINE

4.1 REDEVELOPMENT SCENARIO

The current redevelopment plans for the Site involve the redevelopment of Lot 130 into a commercial building and Lot 133 into a mix of market rate and workforce apartments in the future. The immediate plans for Lot 133 include continued use as a parking lot with the current paved area remaining and leaving the northern half of the lot undisturbed. Future use will include a park and/or the develop of residential housing on Lot 133.

4.2 CLEANUP STRATEGIES

To execute the most appropriate cleanup in consideration of the proposed redevelopment and the recent characterization data, Credere revised the remediation strategy for each lot. These strategies are also discussed in the ABCA/RAP Amendment #1 and summarized below:

Removal and Disposal of Surficial Contaminated Soil

Based on the surface soil sampling results from the additional characterization completed in December 2018 and historical sampling results, an estimated 500 to 1,000 tons of surficial contaminated soil is present across Lots 130 and 133 in six unique areas. The original estimate of contaminated surface soil prior to this additional characterization was 4,000 tons. In consideration of the significantly reduced amount of contamination soil at the Site, the identified contaminated soil can now be removed from both lots and properly disposed offsite.

This change in the cleanup plan has the following beneficial impacts: 1) it eliminates the need to relocate soils from one lot to another, 2) it eliminates the need to create an engineered barrier system on Lot 133 that has to be managed in perpetuity, 3) it allows the cleanup to be more protective of future Site users, 4) it lowers the cleanup and long term management costs of the project, and 5) it eliminates the need for a Declaration of Environmental Covenant (DEC) limiting excavation on the Site.

Interior Floor Repair and Refinishing

The previously selected remedial alternative presumed the Blue Sort Building would be razed to access and remediate a potential VOC source area located beneath the Site building. As indicated above, VOCs were detected in sub-slab air; however, the lack air RAG exceedances suggest the future risk to Site occupants can be managed without source area removal. As such, Credere proposes to repair and seal the Blue Sort Building floor to improve its ability to impede VOC exposure to future occupants through slab vapor migration.

The repair and refinishing will involve sealing penetrations (drains and accessway) through the floor with concrete, leveling and preparing the floor, and adding a new poured continuous concrete surface over the entire floor. A vapor barrier, as needed, in the form of a polyethylene plastic or an epoxy topcoat(s) will be installed to protect future building occupants. The efficacy of the floor repairs will be assessed via the collection of one indoor air samples. Results will be compared to the applicable Maine DEP indoor air RAGs.

Groundwater Characterization

Credere will characterize groundwater conditions on Lot 130 to evaluate the potential vapor intrusion risk to adjacent properties. This will be accomplished by installing four (4) groundwater monitoring wells on Lot 130 (**Figure 2**) and sampling groundwater to assess if concentrations of VOCs are present at concentrations that might present an indoor vapor intrusion risk to nearby basements.

In addition, Credere will collect supplemental soil samples during drilling to assess soil impacts in deeper soil. Lastly, Credere with screen any assessible utility manholes in Sullivan, Jordan, and Goodwin Streets with a properly calibrated PID to evaluate if vapors are migrating through utility corridors. One monitoring well is proposed near Jordan Street and one monitoring well is proposed near the water main that enters the building to align the monitoring network with utility corridors.

4.3 PROPOSED PROJECT TIMELINE

The following schedule is proposed for the cleanup work:

TENTATIVE DATE	ACTION
June 2019	Submit DRAFT SSQAPP
June 2019	Submit Draft ABCA/RAP Amendment #1
June – July 2019	EPA and Maine DEP review period – SSQAPP and ABCA/RAP Public meeting to discuss proposed changes to ABCA/RAP
July 2019	Prepare Final SSQAPP
July 2019	Public Bid of Remediation for Lots 130 & 133
August to mid-September 2019	Perform Remedial Activities
Mid-September 2019	Complete Remedial Activities
By October 2019	Submit Remediation Summary Report

5. UPDATED CONCEPTUAL SITE MODEL

An updated CSM was developed using the findings of the previous investigations and will be updated as new data becomes available. This revised CSM includes a description of the Site, its history and physical setting, contaminants of potential concern (COPCs), nature and extent of contamination, exposure pathways, and potential human and environmental receptors.

5.1 SITE DESCRIPTION

A detailed Site description consisting of Site use, Site location as depicted on **Figure 2**, and Site utilities is included in **Section 3.1**.

5.2 SITE HISTORY

A description of Site history is included in **Section 3.2**.

5.3 PHYSICAL SETTING

Topography

Based on Credere's Site observations and the United States Geological Survey (USGS) Topographic Map of the Somersworth Quadrangle, Maine, Site topography of Lot 133 is sloped to the east towards an unnamed brook that runs adjacent to the eastern lot boundary. The topography of Lot 130 is flat with a slight topographic gradient to the east and south. An excerpt from available USGS maps that cover the Site is included as **Figure 1**.

Geology

Surficial Geology

According to the Maine Geological Survey (MGS) Surficial Geology map of the Somersworth Quadrangle, Maine, the Site is mapped as glacial till consisting of silt, clay, sand, and gravel of variable composition. Soil borings from previous investigations indicate that surficial geology is layered silty sand, clay and some sand deposits. Artificial fill including leather scraps, metal, glass, and rubble have been identified in some areas of the Site and adjoining main Prime Tanning Facility parcel.

Bedrock Geology

According to the MGS Bedrock Geology map of the Somersworth Quadrangle, Maine, bedrock beneath the Site consists of Silurian feldspathic quartz-biotite granofels, calc-silicate granofels and subordinate quartz-biotite schist of the Berwick Formation. During previous investigations at the Site and the adjoining main Prime Tanning Facility parcel, refusal indicating possible bedrock was encountered between 4 and 20 feet below ground surface (bgs).

Hydrology

The Site is located within the surficial drainage basin of the Salmon Falls River located approximately 200 feet south and west of the Site. The Salmon Falls River flows to the south southeast and discharges to Piscataqua River and then to the Atlantic Ocean, approximately 20

miles from the Site. Precipitation that falls on the Site either infiltrates into Site soil, drains via sheet flow, or enters the storm drain system and discharges to the Salmon Falls River. Some ponded water is evident on Lot 130 due to a clogged loading ramp storm water drain.

Previous work at the Site identified depths to groundwater on Lot 133 ranging between approximately 2.62 and 8.86 feet bgs. No groundwater assessment has been conducted on Lot 130. Prior environmental investigations have identified groundwater to flow generally south towards the Salmon Falls River. According to the Maine DEP Significant Sand and Gravel Aquifers Map, no high yielding aquifers are present beneath the Site.

5.4 SOURCE AREAS AND COPCS

Source Areas

The following source areas have been identified for the Site based on the prior environmental investigations at the Site and adjoining main Prime Tanning Facility parcel:

- Long history of use of the Site and adjacent main Prime Tanning facility as a tannery, and associated coal/oil emissions
- Long history of Blue Sort Building usage for tanning related operations including: hide shaving, storage, and warehouse space associated with Prime Tanning
- Hazardous building components within/on the Blue Sort Building

The source area of VOCs has not been definitively identified.

COPCs

Based on the identified source areas and previous environmental investigations, the following are known COPCs for the Site:

- Asbestos
- VOCs
- PAHs
- Resource Conservation and Recovery Act (RCRA) 8 metals
- Components of universal waste
- Hexavalent chromium

5.5 NATURE AND EXTENT OF CONTAMINATION

The inferred extent of known COPCs based on currently available data are as follows:

Asbestos

Approximately 14,000 square feet of spray-on wall and ceiling insulation is present in the eastern portion of the Blue Sort Building. Black roofing cement and silver roof paint was also identified

as ACM; however, are not included within the scope of the proposed remedial alternative outlined in Credere's June 18, 2019 Draft ABCA/RAP Amendment #1.

Additional ACM that was not sampled as part of previous environmental investigations may be present in inaccessible portions of the Blue Sort Building. These materials may be discovered during redevelopment activities.

VOCs

The VOC source is unknown. VOC contaminants may be migrating through utility corridors from the main Prime Tanning Facility parcel or may be emanating from impacted soil beneath the slab and migrating via groundwater. The December 2018 work indicated TCE and other VOCs are presented in soil gas under the Blue Sort Building, but below applicable Maine DEP indoor air RAGs. Based on these concentrations, it is not likely VOCs are migrating to indoor air; however, there is potential.

The nature and extent of VOCs in soil and groundwater at the Site is not known.

PAHs and RCRA 8 Metals

PAHs and lead are considered to be associated with historical industrial use of the Site and surrounding area and specifically tannery operations. PAHs were detected in surface soil (0-2 feet) in four soil samples from borings/test pits SS-101B, TP-113, SB-120, and CA-SS-12 across the Site. Lead was detected in exceedance of Maine DEP RAGs in six surface soil locations (CA-SS-9, CA-SS-10, CA-SS-12, TP-111, TP-114, and TP-122). Based on these prior results, lead and/or PAHs are delineated to six areas of the Site (see **Figure 2**). The excavations will begin with the following basic limits:

- SS-101B - 10-foot x 10-foot excavation centered around the boring to a depth of 2 feet
- TP-113 - 10-foot x 10-foot excavation centered around the test pit to a depth of 2 feet
- CA-SS-12 and TP-122 - 10-foot x 10-foot excavation centered between the locations to a depth of 2 feet
- CA-SS-9, CA-SS-10, and TP-111 - 20-foot x 20-foot excavation centered sample locations to a depth of 2 feet
- SB-120 - 10-foot x 10-foot excavation centered around the boring to a depth of 2 feet
- TP-114 - 10-foot x 10-foot excavation centered around the test pit to a depth of 2 feet

Surface soil in the northern portion of Lot 133 has been assessed in limited locations, therefore, the presence of PAHs and lead above regulatory criteria in this portion of the Site is considered a data gap. As this location is not planned for modification or redevelopment, assessment of potential exposure under current conditions is considered warranted.

Based on the characteristic low solubility of PAHs, they are not expected to be found in groundwater. In addition, groundwater analytical results from two prior monitoring wells installed

on Lot 133 indicated lead concentrations below laboratory reporting limits. As such, these contaminants are not inferred to be present in Site groundwater.

An unnamed brook runs along the eastern Site boundary of Lot 133 toward the main Prime Tanning Facility parcel and eventually discharges to the Salmon Falls River. Preliminary data indicate brook sediment is impacted with PAHs and metals from an offsite upstream source(s) as concentrations upstream contain similar or higher concentrations to those downstream.

Universal wastes (associated with the Site building)

Universal wastes in the form of possible PCB ballasts, fluorescent lighting, exit signs, fire extinguishers, maintenance materials (e.g., paints, cleaners, adhesives, etc.), and mercury-containing thermostats are potentially present throughout the Blue Sort Building. Limited universal wastes were encountered in the building and will be removed as a part of future site redevelopment and not part of this Brownfields project.

Hexavalent Chromium in Groundwater (associated with the buried hides)

Buried tannery waste is known to contain elevated concentration of chromium. With respect to Prime Tanning, hexavalent chromium is a concern because it is the most mobile and toxic form of this metal. Hexavalent chromium may be leaching from any accumulations of hides present on Lot 130 or 133 relative to the nearby Salmon Falls River. Groundwater in proximity of any hides will be considered to potentially contain hexavalent chromium. The extent of any hexavalent chromium is unknown; however, has not been previously documented in prior groundwater samples collected from the Site.

5.6 EXPOSURE PATHWAYS AND POTENTIAL RECEPTORS

Exposure pathways describe how a human or environmental receptor comes into contact with contaminants that may be present at the Site. Potential migration pathways through groundwater, surface water, air, soils, sediments, and biota were considered for each COPC and each source. A migration pathway is considered an exposure pathway if there is a mechanism of contaminant release from primary or secondary sources, a transport medium, and a point of potential contact with receptors. Both current and potential future releases and migration pathways to receptors are considered. Exposure pathways presented in the CSM include the following:

Inhalation:	This pathway is primarily associated with vapor-forming soil or groundwater contamination beneath or near an occupied structure or preferential pathway to an occupied structure. This pathway is applicable when receptors may inhale impacted media in the form of contaminated vapor. This pathway is also applicable when contaminated soil and/or groundwater are exposed via an excavation.
Dermal Absorption:	Exposure via dermal absorption occurs when receptors are exposed to chemical concentrations present in soil, groundwater, surface water, or hazardous building materials 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 direct consumption of soil (e.g., typically by children or construction workers employing poor hygiene).
Incidental Uptake:	This pathway is applicable when receptors may incidentally inhale or ingest impacted media in the form of contaminated dust, soil, chips, or airborne asbestos fibers.

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, or a daycare.
Commercial Workers:	Commercial receptors are those that are present at the Site for long durations but with low intensity exposure such as indoor office workers.
Excavation or Construction Worker:	Excavation or construction 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 utility and construction contractors and landscapers.
Recreational or Park User:	Park users 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. For this project, this receptor class would apply to visitors to the Site and patrons of the restaurants, hotel, or other future commercial businesses at the Site.

5.7 CONCEPTUAL SITE MODEL SUMMARY

COPCs at the Site include: asbestos in Site building components, VOCs in soil gas beneath the Blue Sort Building; suspect VOCs in groundwater adjacent to the Blue Sort Building; PAHs and lead in surface soil in select locations across the entire Site; PAHs and metals in sediment of an unnamed brook runs along the eastern Site boundary of Lot 133; and hexavalent chromium in groundwater in the immediate vicinity of accumulated buried leather hides associated with the past historical use of the Prime Tanning facility.

Based on the planned redevelopment of the Site as residential for Lot 133 and commercial for Lot 130, receptors at the Site include construction workers during redevelopment, residents at Lot 133 after development, and commercial workers or patrons of any office/retail space after redevelopment.

Exposure pathways for all receptors to COPCs include inhalation due to the possible presence of a VOC source area beneath the Blue Sort Building within proximity of the planned residential

building and construction workers within excavations; dermal absorption through direct contact with contaminated soil; active ingestion by construction workers employing poor hygiene or children; and incidental uptake of impacted soil in the form of dust, lead and PCB-containing dust, or airborne asbestos fibers. Although not previously identified, the nearby Salmon Falls River may be also threatened from potential migration of hexavalent chromium in groundwater that leaches from accumulations of buried leather hides.

6. SAMPLE DESIGN

6.1 OBJECTIVES

The following Site-specific objectives have been established for this project:

- Confirm the efficacy of abatement of spray-on insulation from the Blue Sort Building
- Characterize the presence of any previously unidentified suspect asbestos in the Blue Sort Building
- Characterize indoor air conditions following repair and resealing of the Blue Sort Building slab
- Evaluate subsurface VOC source adjacent to the Blue Sort Building and assess groundwater impacts associated with the buried leather hides
- Evaluate previously unassessed surface soil on portions of Lot 133
- Confirm the efficacy of the removal of soil exceeding applicable Maine DEP RAGs
- Characterize unnamed brook sediment conditions following remedial activities

The following tasks are proposed to address these objectives:

- Collect air clearance asbestos samples following spray-on asbestos abatement
- Collect samples following the discovery of additional suspect ACM
- Collect indoor air samples to demonstrate the effectiveness of Blue Sort Building slab repairs and sealing.
- Collect soil and groundwater samples to characterize subsurface conditions adjacent to the Blue Sort Building
- Collect soil samples to characterize surface soil conditions in the northern portion of Lot 133
- Collect excavation confirmatory samples to confirm clear excavation margins
- Collect additional sediment samples from the unnamed stream adjacent to Lot 133 to characterize sediment

Specific sampling methodologies are described in **Section 7**. **Table 1** includes the number and type of samples that are proposed to be collected. **Table 2** is a Standard Operating Procedure (SOP) reference table detailing the version of each SOP that will be used during the sampling program.

6.2 ASBESTOS SAMPLING

Air Clearance Sampling

Credere's previous work indicated +/-14,000 square feet of asbestos containing spray-on insulation is present in the Lot 130 building requiring abatement. Once abatement is completed, air clearance

samples will be collected to confirm the efficacy of the abatement work. Based on the estimated area of ACM, five air clearance samples (CA-AC-1 through CA-AC-5) are anticipated per Maine DEP Chapter 425 – Asbestos Management Regulations (Chapter 425) requirements. Exterior abatements require visual clearances and do not require air clearance samples according to Maine DEP Chapter 425.

Sampling of Discovered Bulk Material(s)

During cleanup activities, if previously unidentified suspect ACM is discovered, it will either be presumed to be ACM, or bulk samples will be collected for laboratory analysis of asbestos content. The number of samples collected will be dependent on the number and volume of suspect materials that are encountered. Credere will collect at least three (3) bulk samples from each type of homogenous suspect ACM to be sampled. Credere will identify samples as follows: CA-SACM-1(A-C), CA-SACM-2(A-C), CA-SACM-3(A-C), etc.

6.3 INDOOR AIR SAMPLING

One indoor air sample (CA-IA-01) will be collected for laboratory analysis from within the Blue Sort Building to assess post floor sealing indoor air concentrations for VOCs to document the efficacy of the sealing effort. It is recognized that pre-sealing indoor air concentrations have not been assessed; however, since the floor sealing is planned as part of the redevelopment, this action is considered a best management practice and the indoor air sample will serve to document this. This sample will be collected at least 1 week after final installation and curing of the floor sealant and adequate ventilation of the Site building of any fumes associated with the sealing material or concrete moisture. The Site building will be returned to normal ventilation for at least 3 days prior to collecting the indoor air sample.

Figure 2 shows the location of the indoor air sample.

6.4 SOIL BORING ADVANCEMENT AND SOIL SAMPLING

To assess for a potential source area beneath Lot 130 for VOCs and evaluate potential vapor impacts to adjacent structures, four (4) soil borings (CA-SB-1 through CA-SB-4) will be advanced during cleanup work around the Lot 130 perimeter. Two soil borings (CA-SB-1 and CA-SB-2) will be advanced in the southwest portion of Lot 130 between the adjacent residence and the Lot 130 building. One soil boring (CA-SB-3) will be advanced in the northern portion of Lot 130 and one soil boring (CA-SB-4) will be advanced immediately downgradient of the water main connection to the Site building (adjacent to where concentrations of VOCs were quantified in sub-slab air). Borings will be drilled into the water table to allow for the installation of groundwater monitoring wells.

One soil sample will be collected from each boring from the area of greatest observed contamination (e.g., former building debris, obvious fill materials, staining, odors, PID response, etc.) encountered above 15 feet. If no contamination is encountered, then a sample will be collected above 15 feet from either the groundwater interface or from the 2-foot interval just above any transition from coarser surface fill to dense silt/clay native soil. No sample will be collected in the absence of the above criteria.

Figure 2 shows the locations of proposed soil borings.

6.5 GROUNDWATER SAMPLING

Additional Groundwater Characterization around Blue Sort Building

Soil borings CA-SB-1 through CA-SB-4 will be completed as groundwater monitoring wells CA-MW-1 through CA-MW-4, respectively. Samples will be collected from each newly installed well after development and a stabilization period of 7 days. Samples will also be collected to assess for groundwater impacts from VOCs. Results will be used to assess if VOCs are migrating offsite and if assessment of the surrounding properties for potential vapor encroachment is warranted.

Credere will sample each well using low-flow sampling methodologies or no-purge methodologies where appropriate. Proposed sample analysis for each respective sample as well as the required volume and preservation is provided on **Table 1**.

Groundwater Sampling in Proximity of Hides

The October 31, 2018 approved SSQAPP included provisions to install pore water devices, temporary groundwater monitoring wells, or collect groundwater directly from excavations containing hides so the collection of these samples will not be discussed further in this SSQAPP.

6.6 SURFACE SOIL SAMPLING

Surface soil in the northern portion of Lot 133 has yet to be fully assessed for PAHs and lead. Given the documented exceedances of PAHs and lead in surface soil at discontinuous locations across the Site, this lack of assessment is considered a data gap. Since this area of the Site has been undisturbed related to historical use, these samples will serve to document this portion of the Site as having no/limited exposure risk. Should these results indicate concentrations of PAHs and lead are ubiquitous across this area, the cleanup and redevelopment plan will be revisited.

This data gap characterization sampling will use incremental sampling methodology (ISM). The northern portion of Lot 133 that will remain undisturbed through redevelopment will be split into two decision units, one for the northern half of this portion of the Site (DU1) and one for the southern half of this portion of the Site (DU2; located between DU1 and the parking lot). DU1 represents an approximately 55’x42’ area, and DU2 represents an approximate 60’x53’ area. Each DU will be sampled with three replicates comprising 50 increments of soil each collected randomly within a grid.

Samples will be submitted to the laboratory for ISM segmenting using the Japanese slabcake method only. No grinding, sieving, or drying is warranted to meet the data quality objectives and to maintain comparability to prior data analyzed by conventional methods.

Replicate data will be tabulated and a coefficient of variation (CV) will be calculated. For DUs where replicate results have a CV less than 0.5, the mean will be used to compare to the RAG to document the concentrations in this area. Replicate results with a CV between 0.5 and 1.5 will be

used to calculate an upper confidence limit (UCL) using the Students-*t* method for determining variation. For replicate results with a CV greater than 1.5, the Chebyshev method for determining variation will be used to calculate the UCL. In these cases, the UCL will be compared to the RAG to document the surface soil concentration.

6.7 POST-EXCAVATION CONFIRMATORY SOIL SAMPLING

Documented PAH and lead-contaminated surficial soil will be excavated, temporarily stockpiled onsite, and properly disposed offsite during the summer of 2019. The excavation areas are planned primarily in the vicinity of the Blue Sort building, the parking lot, and its perimeter to reduce exposure in the most publicly frequented portions of the Site. Six excavation areas are proposed in Credere's June X, 2019, ABCA/RAP Amendment #1. **Figure 2** shows the locations of these excavation areas on Lot 130 and 133. Credere's October 31, 2018, SSQAPP details waste characterization sampling of excavated material.

Post-excavation confirmatory soil samples will be collected using ISM. DUs will represent each 10-foot by 2-foot side wall for the 10'x10' excavations (4 sidewall DUs per excavation) and each sidewall of the 20'x20' excavation will have two DUs per sidewall (8 sidewall DUs). The base of excavation will be one DU for each excavation. It is recognized the 20'x20' excavation will have a larger base DU; however, a proportional number of increments will be collected. For excavations with similar soil types observed for the entire excavation area, each DU will be sampled with one replicate comprising 30 increments of soil collected randomly with one DU per excavation area having three replicates. The base of excavation DU for the 20'x20' excavation will have 120 increments per replicate. If the excavation soil is variable (e.g., one sidewall is fill and one native sand, or one is clay and one sand), each different type of soil observed will have at least one DU with three replicate samples collected, and every additional DU for each soil type will consist of one replicate sample.

A schematic of the DU and increment layout for a typical sidewall is shown on **Figure 2**. Based on the beginning dimensions of the excavations, 34 DUs are anticipated, which totals 46 samples (assuming similar soil types observed for the six excavation areas).

Samples will be submitted to the laboratory for ISM segmenting using the Japanese slabcake method only. No grinding, sieving, or drying is warranted to meet the data quality objectives and to maintain comparability to prior data analyzed by conventional methods.

Replicate data will be tabulated and a CV will be calculated. For excavations where the replicate DU results have a CV less than 0.5, the mean will be used to compare to the RAG to document the concentrations at the extent of the excavation. Replicate results with a CV between 0.5 and 1.5 will be used to calculate a UCL using the Students-*t* method for determining variation. For replicate results with a CV greater than 1.5, the Chebyshev method for determining variation will be used to calculate the UCL. In these cases, the UCL will be compared to the RAG to document the concentrations at the extent of the excavation. Similar variation will be applied to the other DUs within the excavation (or other similar soil types if more than one DU is sampled with replicates) according to the following options:

- If the CV is <0.5 and the mean is used, the other DU results will not be adjusted. However, if the concentration is within 10% of the RAG, the concentrations will be evaluated on a more specific basis.
- If the CV is >0.5 and a UCL is used, the other DU results will be proportionally inflated using the difference between the selected UCL (Student-t's or Chebyshev) and the true mean.

If the mean, UCL or adjusted non-replicated DU results exceeds the RAGs, additional soil will be removed per the RAP and the above sample design will be repeated for the new sidewall.

6.8 ADDITIONAL SEDIMENT SAMPLING

Following remedial activities, three sediment samples (CA-SD-1A through CA-SD-3A) will be collected from the unnamed brook that travels along the northeast Site boundary to assess current sediment conditions. This resampling will occur to characterize the unnamed brook sediment for evidence of any Site related contaminants and to confirm that impacts are from upstream of the Site. One sample will be collected in the northern edge of the Site where the stream enters the Site, one sample will be collected where the stream exits the Site in the southeast corner, and a third between the SS-101B and the CA-SS-12/TP-122 excavations. The October 31, 2018, approved SSQAPP included provisions to collect these samples so the collection methodology of these samples will not be discussed further.

7. SAMPLING AND ANALYTICAL METHOD REQUIREMENTS

7.1 ASBESTOS SAMPLING

Air Clearance Sampling

For abatement techniques that require air clearance sampling, a minimum of two samples (CA-AC-1 and CA-AC-2, etc.) per work/containment area will be collected by a Maine-certified Asbestos Air Monitor and to satisfy Maine DEP Chapter 425 requirements. This work will be done in accordance with Credere SOP CA-15 dated December 3, 2018. Air filter samples will be analyzed by EMSL Analytical, Inc. (EMSL) of South Portland, Maine using Phase Contrast Microscopy (PCM) according to the National Institute of Occupational Safety and Health (NIOSH) Method 7400. Proposed sample analysis for each respective sample as well as the required volume and preservation method is provided in **Table 1**.

Sampling of Discovered Bulk Material(s)

Sampling and analysis of discovered bulk potentially asbestos containing materials will be completed by a Maine-certified Asbestos Inspector and performed in accordance with Maine DEP Chapter 425 and pertinent provisions of Credere SOP CA-15 dated December 3, 2018. Collected samples will be analyzed by ESML using Polarized Light Microscopy (PLM) or Non-friable Organically Bound (NOB) Bulk Material analysis according to EPA Method 600/R-93/116. Proposed sample analysis for each respective sample as well as the required volume and preservation method is provided in **Table 1**.

7.2 INDOOR AIR SAMPLING

Credere will perform indoor air sampling in accordance with SOP CA-14 dated November 29, 2019. First, closed conditions within the building will be verified. These conditions must be present for at least 72-hours prior to beginning the collection of the sample. Credere will then screen the building with a properly calibrated ppbRAE PID and inventory the building for possible background sources of VOCs including: evidence of cigarette smoking, fuel storage, cleaning products, paints or freshly painted surfaces, solvent or solvent use, and any new furnishing (furniture, flooring, and cabinets). An appropriately sized summa canister sample will then be placed in the center of the eastern section of the building, opened, and allowed to collect sample for up to 8 hours or until the pressure gauge reads less than 2 inches of mercury (inHg). The canister will not be allowed to run to 0 inHg.

The sample will be shipped to Alpha Analytical in Westborough, Massachusetts, and analyzed for VOCs. Proposed sample analysis for each respective sample as well as the required volume and preservation method is provided in **Table 1**.

7.3 SOIL BORING ADVANCEMENT AND SOIL SAMPLING

Soil borings will be advanced using direct push drilling methods with a Geoprobe® macrocore sampling device, or equivalent. Soil borings will be advanced to least 5 feet below the groundwater interface or to refusal, whichever is greater. Soil cores will be collected continuously using dedicated, disposable polyethylene liners. Macrocores will be individually logged, evidence of

contamination will be noted, and soil will be field screened for total VOCs using a ppbRae 3000 (or similar) PID calibrated with a 10 ppm_v isobutylene gas standard and an instrument response factor of 1.0.

Representative soil from an appropriate interval (no larger than 2 feet) will be collected while wearing new nitrile gloves and using decontaminated hand tools (e.g., stainless steel spoon or spade). Representative soil will be placed in a decontaminated stainless-steel bowl, homogenized, and placed in laboratory provided glassware. Proposed sample analysis for each respective sample as well as the required volume and preservation method is provided in **Table 1**. Soil samples will be stored on ice and submitted to Absolute Resource Associates (ARA) of Portsmouth, New Hampshire.

No investigation derived waste is anticipated as a part of this work as excess soil at each location will be returned to its place of origin within the boreholes or to the surface surrounding the boreholes.

7.4 GROUNDWATER SAMPLING

Additional Groundwater Characterization around Blue Sort Building

CA-MW-1 through CA-MW-4 will be constructed using 10 feet of 1-inch diameter 0.020-inch slotted PVC screen with at least 5 feet of screen below the depth of the water table to allow for groundwater table fluctuation and enough solid PVC riser to reach the ground surface. The well annuli will be filled with No. 1 washed silica sand, and a bentonite seal will be installed above the screen. CA-MW-1 and CA-MW-2 will be finished with a road box. CA-MW-3 and CA-MW-4 will be finished with a standpipe and locking cap.

Following installation, each monitoring wells' top of PVC elevation will be surveyed to an onsite benchmark, if available, or an arbitrary datum, if necessary. Depth to groundwater and light non-aqueous phase liquid (LNAPL) thicknesses, if present, will then be measured relative to the top of well elevations to allow for the calculation of relative groundwater elevations and the determination of groundwater flow direction at the Site.

Each well will be developed by overpumping and agitation methods. The wells will be purged until at total of at least three well volumes have been removed and turbidity has been reduced to less than 10 NTUs. Credere will allow at least 7 days for the monitoring wells to equilibrate with the surrounding aquifer prior to sampling.

Following the appropriate period of stabilization, Credere will sample each well using low-flow sampling methodologies or no-purge methodologies where appropriate in accordance with Credere SOPs CA-12 dated September 28, 2018.

Monitoring wells will be purged with a peristaltic pump with Teflon-lined polyethylene tubing at a stable flow rate to avoid drawdown of the water level. Purging will occur by one of the following methods, with the first option being preferable:

1. If a stable flow rate can be achieved, groundwater will be periodically monitored for temperature, pH, oxidation-reduction potential, specific conductivity, dissolved oxygen, and turbidity using a multi-parameter sonde (MPS) and an in-line flow-through cell and separate turbidity meter until parameters have stabilized over a period of three readings, spaced at least 5 minutes apart or at a spacing to allow for a complete exchange of flow through the flow-through cell based on the flow-through cell volume and flow rate. If parameters do not stabilize within a period of 2 hours or before a maximum purge volume of 5 well volumes, samples will be collected with field note justification of attempts to achieve stabilization and data will be reviewed for evidence of bias.
2. If a stable flow rate cannot be achieved and drawdown of more than 1 foot occurs at the lowest possible flow rate, purging will be ceased and the no-purge sampling method will be implemented. Tubing will be placed at the desired pump intake, one tubing volume will be purged, and samples will be collected. The wells will not be permitted to be pumped dry.

Groundwater samples will be collected immediately after the pump and directly into the appropriate laboratory glassware. Proposed sample analysis for each respective sample as well as the required volume and preservation is provided on **Table 1**. Groundwater samples will be stored on ice and submitted to ARA for analysis.

Groundwater Sampling in Proximity of Hides

See October 31, 2019, approved SSQAPP for hide related groundwater sampling methodology.

7.5 SURFACE SOIL SAMPLING

This work will be completed in accordance with Credere's SOP CA-26, Revision 1, dated May 16, 2019. DUs will be located on the surface using a global positioning system (GPS) unit and pin flags to mark the centroid point of each grid box. Each replicate will be collected by using a tile push sampler to collect 50 increments from 0 to 0.5-foot bgs. Increments will be collected by locating the centroid point for the respective grid box, then collecting one increment approximately 2-3 feet from the centroid point in a random direction. Each increment will be placed directly into a resealable 1-gallon plastic bag. This process will be repeated for each replicate for each DU.

Credere will describe the soil type making note of the heterogeneity of soil types and evidence of contamination between other DUs. Proposed sample analysis for each respective sample as well as the required volume and preservation method is provided in **Table 1**. Samples will be stored on ice and submitted to ARA for Japanese slabcake segmenting and analysis.

7.6 POST-EXCAVATION CONFIRMATORY SOIL SAMPLING

This work will be completed in accordance with Credere's SOP CA-26, Revision 1, dated May 16, 2019. DUs will be located using pin flags at the top of the excavation sidewall and will surveyed with a GPS unit. Each replicate will be collected by using a dedicated cylindrical soil syringe to collect 30 random increments from the DU. Each increment will be placed directly into

the soil container. This process will be repeated three times as necessary for each DU for three replicates per DU.

Credere will describe the soil type making note of the heterogeneity of soil types and evidence of contamination between other DUs. Proposed sample analysis for each respective sample as well as the required volume and preservation method is provided in **Table 1**. Samples will be stored on ice and submitted to ARA of Portsmouth, New Hampshire for Japanese slabcake segmenting and analysis. **Figure 2** shows soil excavation areas along with a schematic of a typical DU sampling grid with the optional replicate samples.

7.7 ADDITIONAL SEDIMENT SAMPLING

See October 31, 2019, SSQAPP for sediment sampling methodology.

8. REGULATORY STANDARDS

Sample results will be compared to applicable state and/or federal standards/guidelines described below. **Appendix A** includes Analytical Sensitivity and Project Criteria Tables for the Site, which compares regulatory standards for each contaminant to the analytical limits of the laboratory method used.

8.1 ASBESTOS SAMPLING

Laboratory analytical results for asbestos air samples will be compared to the limit of a total fiber count of less than or equal to 0.010 fibers per cubic centimeter (f/cc) for air (as analyzed by PCM) as specified in Maine DEP Chapter 425.

Laboratory analytical results for asbestos bulk samples will be compared to the limit of 1% by weight as specified in Maine DEP Chapter 425.

8.2 INDOOR AIR SAMPLING

Laboratory results for the indoor air sampling will be compared to the October 19, 2018, Maine DEP RAGs Table 4: Maine Remedial Action Guidelines for the Indoor Air Exposure Pathway, commercial exposure scenario.

8.3 SOIL SAMPLING

Laboratory results for the soil sampling will be compared to the October 19, 2018 Maine DEP RAGs Table 3: Maine Remedial Action Guidelines for the Soil Exposure Pathway, residential, park user, commercial and construction worker exposure scenarios. ISM replicate results will be compared as a mean or UCL of the replicates from each DU as discussed in **Section 6.6**.

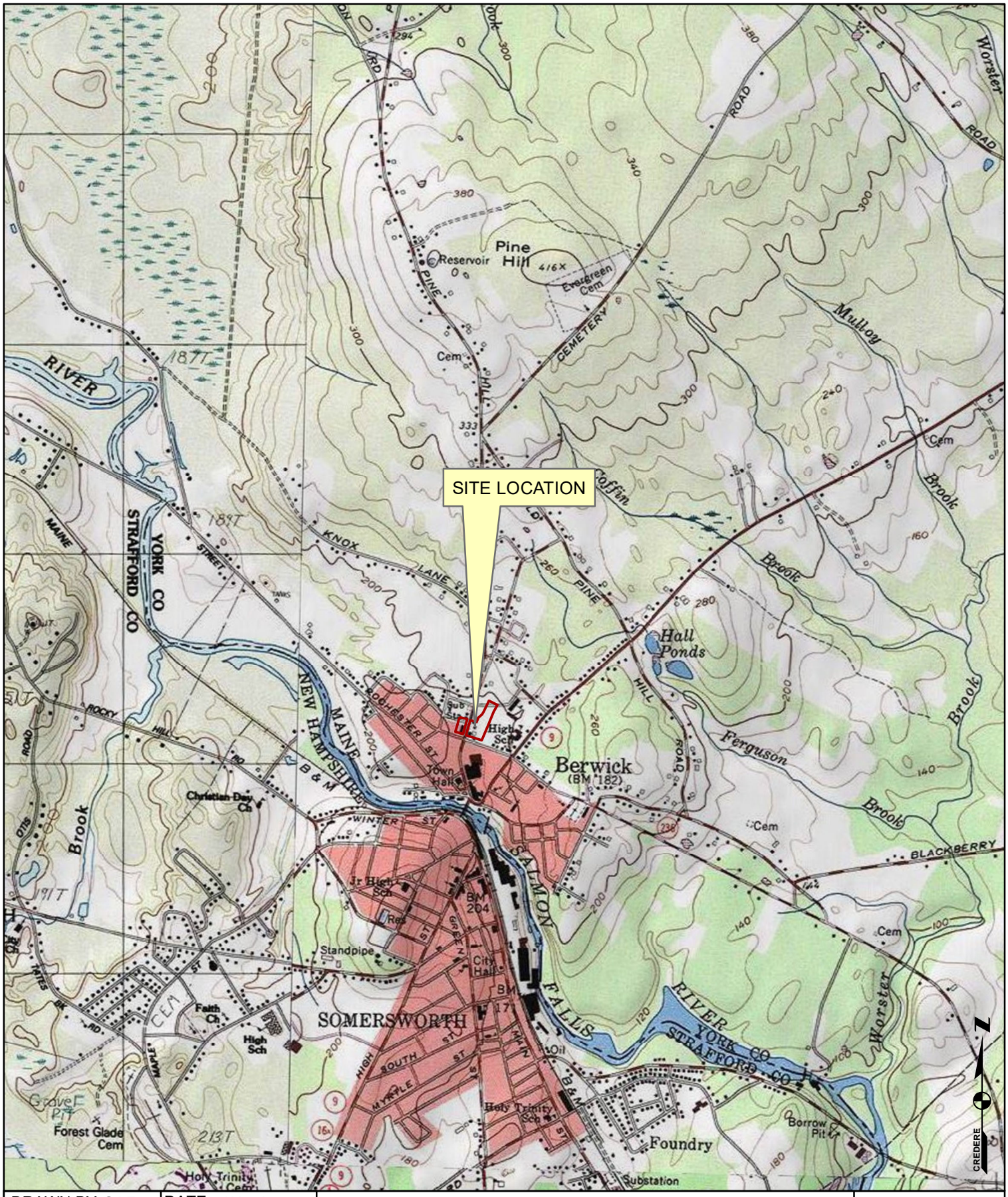
8.4 GROUNDWATER SAMPLING

Laboratory results for the groundwater sampling will be compared to the October 19, 2018 Maine DEP RAGs Table 5: Maine Remedial Action Guidelines for the Groundwater Exposure Pathway, residential and construction worker exposure scenarios.

8.5 SEDIMENT SAMPLING

Laboratory results for the sediment sampling will be compared to the October 19, 2018 Maine DEP RAGs Table 3: Maine Remedial Action Guidelines for the Soil Exposure Pathway, recreator sediment exposure scenario.

FIGURES



DRAWN BY: **SAF**	DATE: **6/1/2018**
CHECKED BY: **RSV**	PROJECT: **18001444**

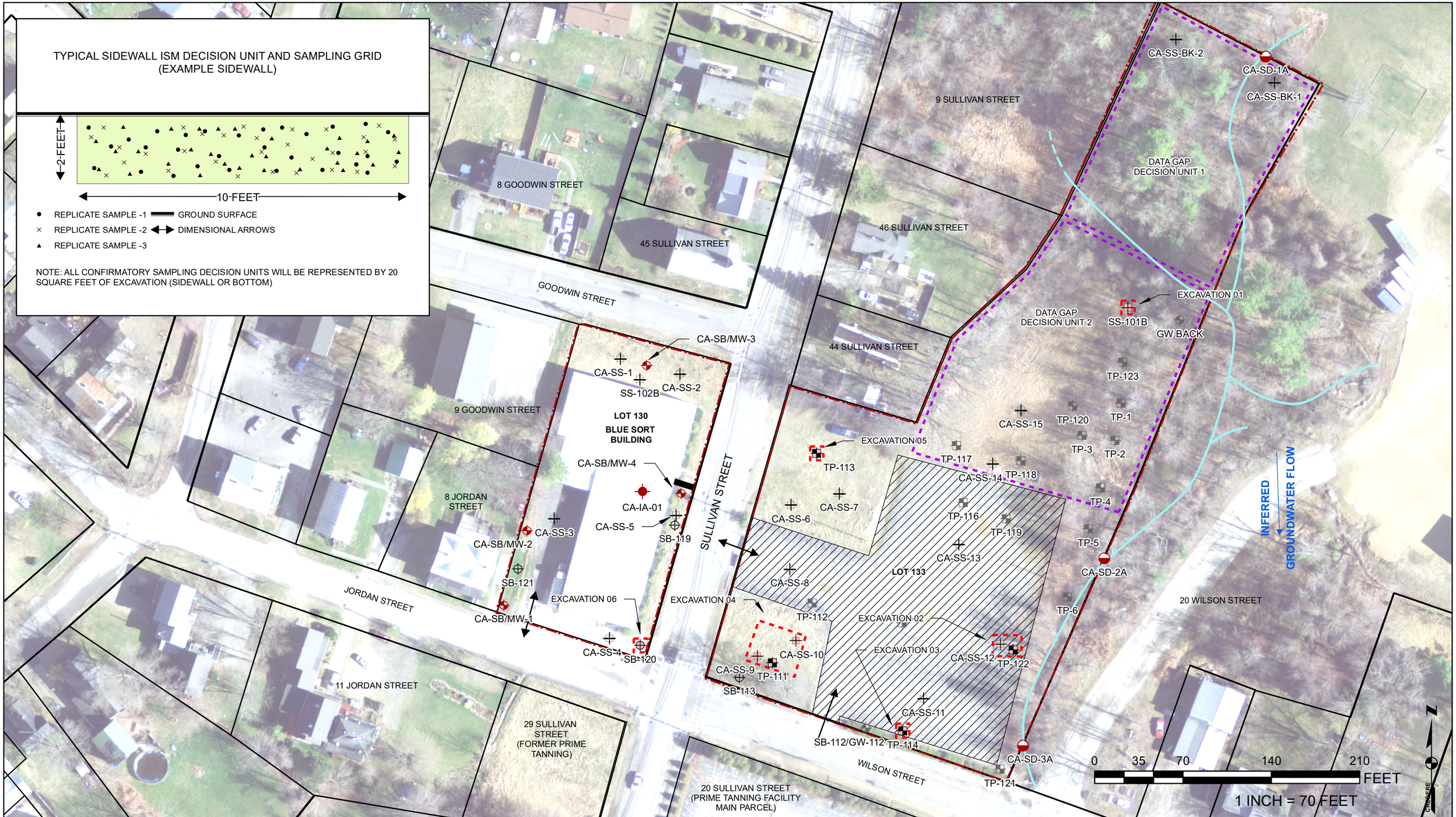
Credere Associates, LLC
776 MAIN STREET
WESTBROOK, MAINE
Tel. 207.828.1272
Fax 207.887.1051
WWW.CREDERELLC.COM

FIGURE 1
SITE LOCATION PLAN

PRIME TANNING LOTS 130 AND 133
35 AND 34 SULLIVAN STREET
BERWICK, MAINE

1,000 0 2,000 Feet
1 INCH = 2,000 FEET

Topographic Map Data Copyright:© 2013 National Geographic Society, i-cubed



DRAWN BY: **SAF**	DATE: **06/11/2019**
CHECKED BY: **RSV**	PROJECT: **18001444**

Credere Associates, LLC
776 MAIN STREET
WESTBROOK, MAINE
Tel. 207.828.1272
Fax 207.887.1051
WWW.CREDERELLC.COM

FIGURE 2
PROPOSED SAMPLE LOCATION PLAN

PRIME TANNING LOTS 130 AND 133
35 AND 34 SULLIVAN STREET
BERWICK, MAINE

- PRIOR SOIL BORING SAMPLE LOCATION WITH NO CONTAMINANT EXCEEDANCE
- PRIOR TEST PIT LOCATION WITH NO CONTAMINANT EXCEEDANCE
- PRIOR SURFACE SOIL SAMPLE LOCATION WITH NO CONTAMINANT EXCEEDANCE
- PRIOR SOIL BORING/GROUNDWATER SAMPLE LOCATION WITH NO CONTAMINANT EXCEEDANCE
- SOIL BORING LOCATION WITH EXCEEDANCE OF PAHs AND/OR LEAD CONCENTRATIONS
- TEST PIT LOCATION WITH EXCEEDANCE OF PAH AND/OR LEAD CONCENTRATION
- SURFACE SOIL SAMPLE LOCATION WITH EXCEEDANCE OF PAH OR LEAD CONCENTRATIONS
- PROPOSED SOIL BORING/MONITORING WELL LOCATION
- PROPOSED INDOOR AIR SAMPLE LOCATION
- PROPOSED SEDIMENT SAMPLE LOCATION
- APPROXIMATE PATH OF UNNAMED BROOK
- SITE ACCESS POINT
- SITE BOUNDARY
- EXISTING ASPHALT PARKING LOT
- WATER MAIN CONNECTION
- PROPOSED EXCAVATION AREA
- PROPOSED DATA GAP DECISION UNIT AREA
- PARCEL BOUNDARY

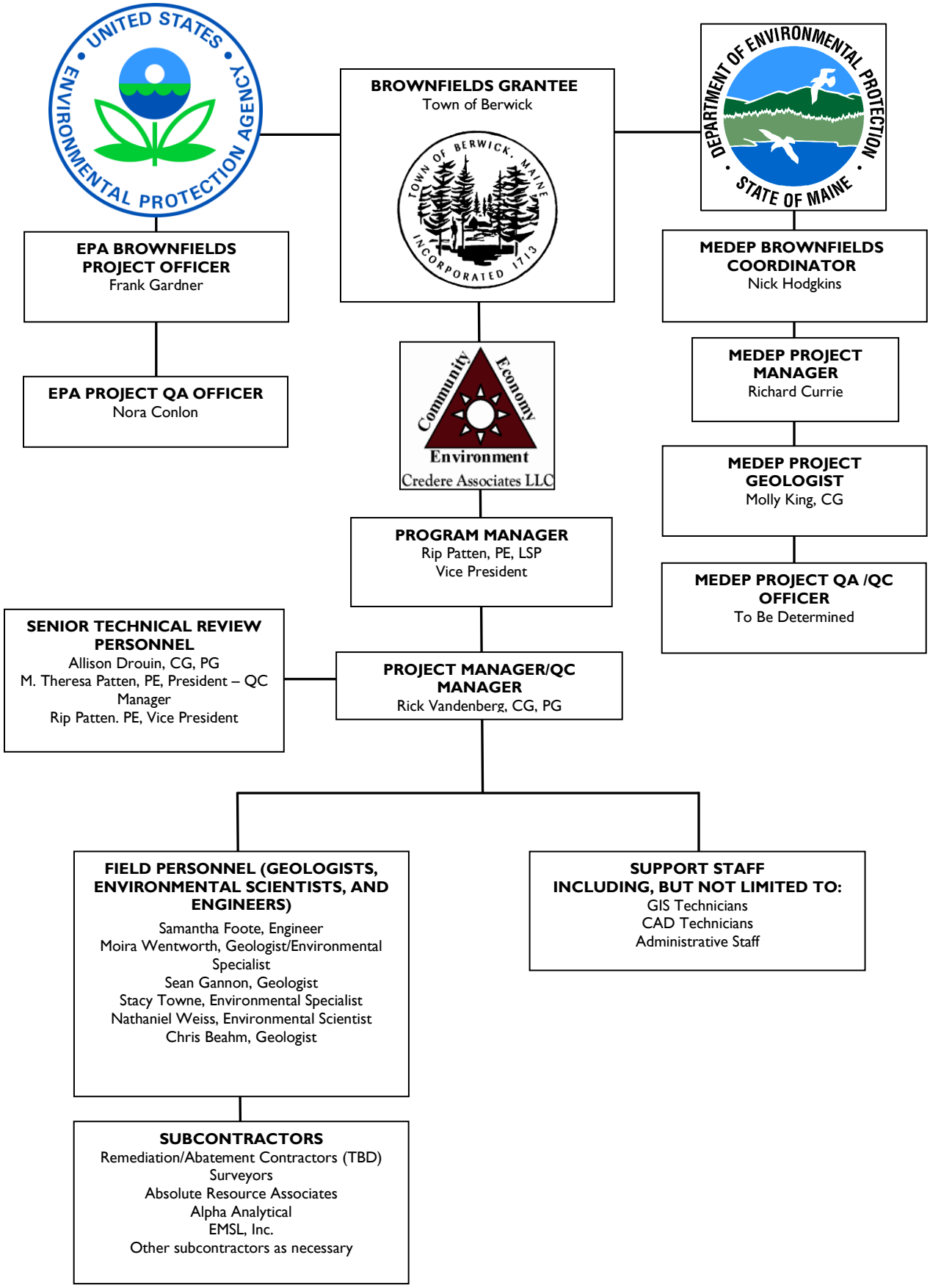
NOTES:
EXISTING CONDITIONS AND FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE AND ARE BASED ON THE INFORMATION OBTAINED FROM THE TOWN OF BERWICK ONLINE ASSESSORS DATA, MAINE GIS PARCEL LAYER, AND 2012 ORTHO PHOTOS,

SAMPLE LOCATIONS AND NOMENCLATURE ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS.

Ortho Image Maine GeoLibrary

Document Path: T:\Data\ME\Town\Berwick\18001444 - Prime Tanning Lots 130 and 133\Figure 2_SSQAPP amendment #1.mxd

Figure 3 – Project Organization Flow Chart



TABLES

Table 1: Sample Reference Table
Prime Tanning Lots 130 and 133
35 and 34 Sullivan Street, Berwick, Maine

Media to be Collected	Proposed Sample IDs	QC Samples	Target Boring/ Well Depth	Sample Type	Sample Rationale	Sample Target Depth (feet bgs)	Field Analysis/ Observations	Analytical Methods	Sample Container Information & Preservative (per location)[1]	Laboratory To Be Used
Asbestos Clearance Sampling	CA-AC-1 through CA-AC-5	Field blank: AC-FB-1	NA	Air	Air clearance sampling required prior to releasing an asbestos regulated work area	NA	Visual	Phase Contrast Microscopy (NIOSH 7400)	Filter in dedicated cassette	EMSL, South Portland, Maine
Asbestos-Containing Materials	CA-SACM-10 (A-C), CA-SACM-111 (A-C), etc.	Triplicate sampling (A-C)	NA	Suspect ACM	To assess for the presence of asbestos within/on the Site building in previously untested materials	NA	Visual	Polarized Light Microscopy/Non-friable Organically Bound Asbestos (EPA 600/R-93/116)	Plastic zipper bags	
Indoor Air	CA-IA-01	Field duplicate: IA-DUP-1	NA	Indoor air	To assess VOC concentrations in Site Building	NA	Visual Olfactory PID (ppb)	VOCs (EPA Method 8260C TO-15 SIM)	(1) pre-evacuated batch-cleaned 6-liter summa canister	Absolute Resource Associates, Portsmouth, New Hampshire
Soil	CA-SB-1	None	At least 5 feet past the groundwater interface for monitoring well installation	Subsurface soil	To assess for the presence of VOCs associated with a source area beneath the Site building	Depth of greatest observed contamination	Visual Olfactory PID (ppb)	VOCs (EPA 8260C)	(3) 40 mL VOA preserved with MeOH [1] and reagent water [2], no headspace (1) 2 oz plastic syringe/glass jar for dry weight	
	CA-SB-2								(3) 40 mL VOA preserved with MeOH [1] and reagent water [2], no headspace (1) 2 oz plastic syringe/glass jar for dry weight	
	CA-SB-3								(3) 40 mL VOA preserved with MeOH [1] and reagent water [2], no headspace (1) 2 oz plastic syringe/glass jar for dry weight	
	CA-SB-4	Field duplicate: SB-DUP-1							(6) 40 mL VOA preserved with MeOH [2] and reagent water [4], no headspace (2) 2 oz plastic syringe/glass jar for dry weight	
Groundwater	CA-MW-1	None	Straddling groundwater interface	Groundwater	Soil borings CA-SB-1 through CA-SB-4 to be completed as monitoring wells to assess for the presence of VOCs associated with a source area beneath the Site building	Pump intake within screened interval	Visual, olfactory, temperature, DO, pH, ORP, specific conductivity, turbidity	VOCs (EPA 8260C)	(2) 40 mL VOA preserved with HCl	
	CA-MW-2								(2) 40 mL VOA preserved with HCl	
	CA-MW-3								(2) 40 mL VOA preserved with HCl	
	CA-MW-4	Field duplicate MW-DUP-1							(4) 40 mL VOA preserved with HCl	
	GW-TB-1	Trip blank	NA	Quality control	To assess cross contamination of volatiles within sample collers or other sources during transport	NA	NA		Provided by lab	
Sediment	CA-SD-1A	None	Surface of unnamed brook river bed	Surface sediment	To assess sediment along unnamed brook	NA	Visual	VOCs (EPA 8260C) SVOCs (EPA 8270D) RCRA 8 Metals (EPA 6020A and 7471B)	(3) 40 mL VOA preserved with MeOH [1] and reagent water [2], no headspace (1) 8 oz amber jar with Teflon-lined cap (1) 4 oz glass jar with Teflon-lined cap	
	CA-SD-2A	Field duplicate: SD-DUP-1							(6) 40 mL VOA preserved with MeOH [2] and reagent water [4], no headspace (2) 8 oz amber jar with Teflon-lined cap (2) 4 oz glass jar with Teflon-lined cap	
	CA-SD-3A	None							(3) 40 mL VOA preserved with MeOH [1] and reagent water [2], no headspace (1) 8 oz amber jar with Teflon-lined cap (1) 4 oz glass jar with Teflon-lined cap	
	SD-TB-1	Trip blank	NA	Quality control	To assess cross contamination of volatiles within sample collers or other sources during transport	NA	NA	VOCs (EPA 8260C)	Provided by lab	

Table 1: Sample Reference Table
Prime Tanning Lots 130 and 133
35 and 34 Sullivan Street, Berwick, Maine

Media to be Collected	Proposed Sample IDs	QC Samples	Target Boring/ Well Depth	Sample Type	Sample Rationale	Sample Target Depth (feet bgs)	Field Analysis/ Observations	Analytical Methods	Sample Container Information & Preservative (per location)[1]	Laboratory To Be Used
Soil	DGDU1-1, DGDU1-2, DGDU1-3	Replicate sampling & MS/MSD at DGDU1-1	0.5 feet bgs	Surface soil	ISM collected from the surface soil in the northern portion of Lot 133 to assess for the presence of PAHs and lead using ISM	50 increments randomly collected per replicate	Visual Olfactory	PAHs (EPA Method 8270D) Lead (EPA Method 6020A) ISM processing	(1) 8 oz amber jar (each sample; 3 anticipated)	Absolute Resource Associates, Portsmouth, New Hampshire
	DGDU2-1. DGDU2-2, DGDU2-3	Replicate sampling & MS/MSD at DGDU2-1	0.5 feet bgs		ISM collected from the surface soil in the northwestern portion of Lot 133 to assess for the presence of PAHs and lead using ISM				(1) 8 oz amber jar (each sample; 3 anticipated)	
	01DU1-1, 01DU1-2, 01DU1-3	Replicate sampling & MS/MSD at 01DU1-1	Excavation depth anticipated to be 10 ft L x 10 ft W x 2 ft D	Soil	ISM collected from north sidewall of Excavation 01 (SS-101B) to confirm removal of PAH and lead-impacted soil using ISM	30 increments randomly collected per replicate		PAHs (EPA Method 8270D) Lead (EPA Method 6020A) ISM processing	(1) 8 oz amber jar (each sample; 3 anticipated)	
	01DU2-1	None			ISM collected from east sidewall of Excavation 01 (SS-101B) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	01DU3-1				ISM collected from south sidewall of Excavation 01 (SS-101B) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	01DU4-1				ISM collected from west sidewall of Excavation 01 (SS-101B) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	01DUB-1				ISM collected from base of Excavation 01 (SS-101B) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	02DU1-1	None	Excavation depth anticipated to be 10 ft L x 10 ft W x 2 ft D		ISM collected from north sidewall of Excavation 02 (CA-SS-12 and TP-122) to confirm removal of PAH and lead-impacted soil using ISM	30 increments randomly collected per replicate		PAHs (EPA Method 8270D) Lead (EPA Method 6020A) ISM processing	(1) 8 oz amber jar (each sample; 1 anticipated)	
	02DU2-1, 02DU2-2, 02DU2-3	Replicate sampling & MS/MSD at 02DU2-1			ISM collected from east sidewall of Excavation 02 (CA-SS-12 and TP-122) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 3 anticipated)	
	02DU3-1	None			ISM collected from south sidewall of Excavation 02 (CA-SS-12 and TP-122) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	02DU4-1				ISM collected from west sidewall of Excavation 02 (CA-SS-12 and TP-122) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	02DUB-1				ISM collected from base of Excavation 02 (CA-SS-12 and TP-122) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	03DU1-1	None	Excavation depth anticipated to be 10 ft L x 10 ft W x 2 ft D		ISM collected from north sidewall of Excavation 03 (TP-114) to confirm removal of PAH and lead-impacted soil using ISM	30 increments randomly collected per replicate		PAHs (EPA Method 8270D) Lead (EPA Method 6020A) ISM processing	(1) 8 oz amber jar (each sample; 1 anticipated)	
	03DU2-1				ISM collected from east sidewall of Excavation 03 (TP-114) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	03DU3-1, 03DU3-2, 03DU3-3	Replicate sampling & MS/MSD at 03DU3-1			ISM collected from south sidewall of Excavation 03 (TP-114) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 3 anticipated)	
	03DU4-1	None			ISM collected from west sidewall of Excavation 03 (TP-114) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	03DUB-1				ISM collected from base of Excavation 03 (TP-114) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	

Table 1: Sample Reference Table
Prime Tanning Lots 130 and 133
35 and 34 Sullivan Street, Berwick, Maine

Media to be Collected	Proposed Sample IDs	QC Samples	Target Boring/ Well Depth	Sample Type	Sample Rationale	Sample Target Depth (feet bgs)	Field Analysis/ Observations	Analytical Methods	Sample Container Information & Preservative (per location)[1]	Laboratory To Be Used
Soil	04DU1-1	None	Excavation depth anticipated to be 20 ft L x 20 ft W x 2 ft D	Soil	ISM collected from north sidewall of Excavation 04 (CA-SS-9, CA-SS-10, AND TP-111) to confirm removal of PAH and lead-impacted soil using ISM	30 increments randomly collected per replicate	Visual Olfactory	PAHs (EPA Method 8270D) Lead (EPA Method 6020A) ISM processing	(1) 8 oz amber jar (each sample; 1 anticipated)	Absolute Resource Associates, Portsmouth, New Hampshire
	04DU2-1								(1) 8 oz amber jar (each sample; 1 anticipated)	
	01DU3-1				ISM collected from east sidewall of Excavation 04 (CA-SS-9, CA-SS-10, AND TP-111) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	04DU4-1								(1) 8 oz amber jar (each sample; 1 anticipated)	
	04DU5-1				ISM collected from south sidewall of Excavation 04 (CA-SS-9, CA-SS-10, AND TP-111) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	04DU6-1								(1) 8 oz amber jar (each sample; 1 anticipated)	
	04DU7-1, 04DU7-2, 04DU7-3	Replicate sampling & MS/MSD at 04DU7-1			ISM collected from west sidewall of Excavation 04 (CA-SS-9, CA-SS-10, AND TP-111) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 3 anticipated)	
	04DU8-1	None							(1) 8 oz amber jar (each sample; 1 anticipated)	
	04DUB-1				ISM collected from base of Excavation 04 (CA-SS-9, CA-SS-10, AND TP-111) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	05DU1-1	None	Excavation depth anticipated to be 10 ft L x 10 ft W x 2 ft D		ISM collected from north sidewall of Excavation 05 (TP-113) to confirm removal of PAH and lead-impacted soil using ISM	30 increments randomly collected per replicate		PAHs (EPA Method 8270D) Lead (EPA Method 6020A) ISM processing	(1) 8 oz amber jar (each sample; 1 anticipated)	
	05DU2-1				ISM collected from east sidewall of Excavation 05 (TP-113) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	05DU3-1				ISM collected from south sidewall of Excavation 05 (TP-113) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	05DU4-1, 05DU4-2, 05DU4-3	Replicate sampling & MS/MSD at 05DU4-1			ISM collected from west sidewall of Excavation 05 (TP-113) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 3 anticipated)	
	05DUB-1	None			ISM collected from base of Excavation 05 (TP-113) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	06DU1-1	None	Excavation depth anticipated to be 10 ft L x 10 ft W x 2 ft D		ISM collected from north sidewall of Excavation 06 (SB-120) to confirm removal of PAH and lead-impacted soil using ISM	30 increments randomly collected per replicate		PAHs (EPA Method 8270D) Lead (EPA Method 6020A) ISM processing	(1) 8 oz amber jar (each sample; 1 anticipated)	
	06DU2-1				ISM collected from east sidewall of Excavation 06 (SB-120) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	06DU3-1				ISM collected from south sidewall of Excavation 06 (SB-120) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	06DU4-1				ISM collected from west sidewall of Excavation 06 (SB-120) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 1 anticipated)	
	06DUB-1, 06DUB-2, 06DUB-3	Replicate sampling & MS/MSD at 06DUB-1			ISM collected from base of Excavation 06 (SB-120) to confirm removal of PAH and lead-impacted soil using ISM				(1) 8 oz amber jar (each sample; 3 anticipated)	

Notes:

1 - All samples will be chilled to 4°C (+/- 2°C) and submitted to the laboratory on ice. Additional details regarding analytical method, sample preservation, sample volume and hold times can be found in Section 7.3 of Credere's Generic QAPP (RFA #19043).

*Total number of screening/sample locations will be determined during field activities

PAH - polycyclic aromatic hydrocarbons
ISM - incremental sampling methodology
PCB - polychlorinated biphenyl

RCRA - Resource Conservation and Recovery Act
VOC - volatile organic compound
SVOC - semi volatile organic compound

MeOH - methanol
HDPE - high density polyethylene
HNO_3 - nitric acid
EPA - Environmental Protection Agency

Table 2: Standard Operating Procedure (SOP) Reference Table
Prime Tanning, Lots 130 and 133
35 and 34 Sullivan Street, Berwick, Maine

Field SOPs

SOP	SOP Description	Date
CA-1	Field Activity Documentation	Revision 1, August 2, 2016
CA-2	Equipment Decontamination Procedures	March 17, 2016
CA-4	Soil Description	March 17, 2016
CA-5	Environmental Soil Sampling	Revision 1, March 9, 2018
CA-7	Headspace and Field Screening	May 20, 2016
CA-8	Monitoring Well Installation	Revision 1, October 20, 2017
CA-9	Well Development	Revision 1, October 20, 2017
CA-10	Monitoring Well Gauging	August 29, 2016
CA-11	Water Quality Field Instrument Calibration	Revision 1, September 28, 2018
CA-12	Groundwater Sampling	Revision 3, September 28, 2018
CA-14	Sub-Slab and Indoor Air Sampling	November 29, 2017
CA-15	Asbestos Containing Materials (ACM) Surveys and Asbestos Abatement Air Monitoring and Clearances	December 3, 2018
CA-16	Chain of Custody	November 29, 2017
CA-20	Relative Elevation Survey & Trimble GNSS Basic Operations	March 6, 2019
CA-26	Incremental Sampling Methodology	Revision 1, May 16, 2019

Laboratory SOPs

SOP	SOP Description	Date
ASB-SOP-300-PCM NIOSH 7400	Asbestos and Other Fibers by PCM	Revision 16.0, January 19, 2017
ASB-SOP-200-PLM	Polarized Light Microscopy SOP	Revision 12.14, May 30, 2017
ASB-SOP-403 TEM NOB	Asbestos Analysis of Non-Friable Organically Bound Materials by Transmission Electron Microscopy	Revision 6.0, October 2, 2018
QA-5120	Analysis of VOCs in Water and Solid Samples by EPA Method 8260C	Revision 15, February 2018
QA-5515	Preparation and Analysis of PAHs, Base/Neutrals, and Acids by EPA Method 8270D	Revision 12, February 2018
QA-5600	Mercury Analysis by Cold Vapor Methods 245.1, 7470A/7471B	Revision 18, February 2019
QA-5605	Determination of Metals and Trace Elements in Water, Solids, and Wastes by Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) by 200.8/6020A	Revision 6, February 2019
QA-5813	Hexavalent Chromium SM 3500 Cr-B and SW-846 7196A	Revision 8, March 2018

All SOPs are referenced in Credere's Generic QAPP RFA #19043

Laboratory SOPs are from the labs indicated in Table 1

APPENDIX A

Analytical Sensitivity and Project Criteria Tables

Asbestos in Air via Filter Media by PCM by NIOSH Method 7400		
Analyte	**Laboratory Practical Quantitation Limit[1]**	**Regulatory Standard[2]**
Asbestos	7.0 fibers/mm^2 on filter	0.01 fibers/cc air

Notes:

PQL from EMSL of South Portland, Maine

mm^2 - square millimeter

1 - Sample volume will be adjusted to give 100 to 1300 fibers/mm^2 where possible then the quantitative result is calculated versus the sample volume for regulatory comparison.

2 - Maine Department of Environmental Protection (DEP) Chapter 425: Asbestos Management Regulations, April 3, 2011.

Asbestos in Solids by PLM by EPA Method 600/R		
Analyte	**Laboratory Practical Quantitation Limit**	**Regulatory Guideline[1]**
Asbestos	0.20%	1%

Notes:

1 - Maine Department of Environmental Protection (DEP) Chapter 425: Asbestos Management Regulations, April 3, 2011

PQL from EMSL of Cinnaminson, New Jersey

Metals in Soil by EPA Method 6020A					
Analyte	**Laboratory Practical Quantitation Limit**	**Comparison Criteria[1]**			
		Residential	**Commercial Worker**	**Park User**	**Construction Worker**
Lead	0.5	140	440	290	450

Notes:
All values are in milligrams per kilogram (mg/kg)
PQLs from Absolute Resource Associates of Portsmouth, New Hampshire
1 - Maine Department of Environmental Protection (DEP) Remedial Action Guidelines (RAGs) for Sites Contaminated with Hazardous Substances, October 19, 2018.

PAHs in Soil by 8270D					
Analyte	Laboratory Practical Quantitation Limit	Comparison Criteria[1]			
		Residential	Commercial Worker	Park User	Construction Worker
2-methylnaphthalene	0.5	330	4,100	930	960
acenaphthene	0.5	4,900	62,000	14,000	48,000
acenaphthylene	0.5	4,900	45,000	14,000	48,000
anthracene	0.5	25,000	100,000	70,000	100,000
benzo(a)anthracene	0.5	16	280	45	1,700
benzo(a)pyrene	0.4	1.6	29	4.5	9.9
benzo(b)fluoranthene	0.5	16	290	45	1,700
benzo(g,h,i)perylene	0.5	2,500	23,000	7,000	72,000
benzo(k)fluoranthene	0.5	160	2,900	450	17,000
chrysene	0.5	1,600	29,000	4,500	100,000
dibenzo(a,h)anthracene	0.4	1.6	29	4.5	170
dibenzofuran	0.5	100	1,400	280	1,200
fluoranthene	0.5	3,300	41,000	9,300	24,000
fluorene	0.5	3,300	41,000	9,300	96,000
indeno(1,2,3-cd)pyrene	0.5	16	290	45	1,700
naphthalene	0.5	57	250	1,300	130
phenanthrene	0.5	2,500	23,000	7,000	72,000
pyrene	0.5	2,500	31,000	7,000	72,000

Notes:

All values are in milligrams per kilogram (mg/kg)

PQLs from Absolute Resource Associates of Portsmouth, New Hampshire

1 - Maine Department of Environmental Protection (DEP) Remedial Action Guidelines (RAGs) for Sites Contaminated with Hazardous Substances, October 19, 2018.

RCRA 8 Metals in Soil by EPA Method 6020A		
Analyte	**Laboratory Practical Quantitation Limit**	**Comparison Criteria[1]**
		Recreator Sediment
Arsenic	0.5	30
Barium	2	70,000
Cadmium	0.2	320
Chromium (III)	2.5	100,000
Chromium (VI)	2.5	14
Lead	0.5	290
Selenium	2	1,800
Silver	0.4	1,800

Notes:

All values are in milligrams per kilogram (mg/kg)

PQLs from Absolute Resource Associates of Portsmouth, New Hampshire

Although mercury is a RCRA 8 metal, because it is analyzed with a different analytical method, it has a separate analytical sensitivity table.

1 - Maine Department of Environmental Protection (DEP) Remedial Action Guidelines (RAGs) for Sites Contaminated with Hazardous Substances, October 19, 2018.

SVOCs in Soil by EPA Method 8270D		
Analyte	Laboratory Practical Quantitation Limit	Comparison Criteria[1]
		Recreator Sediment
1,2,4-trichlorobenzene	0.5	1,100
1,2-dichlorobenzene	0.2	32,000
1,3-dichlorobenzene	0.2	32,000
1,4-dichlorobenzene	0.2	5,800
1,4-dioxane	2	310
2,4,5-trichlorophenol	0.2	28,000
2,4,6-trichlorophenol	0.2	280
2,4-dichlorophenol	0.5	850
2,4-dimethylphenol	0.2	5,700
2,4-dinitrophenol	5	570
2,4-dinitrotoluene	0.2	78
2,6-dinitrotoluene	0.2	16
2-chloronaphthalene	0.5	22,000
2-chlorophenol	0.5	1,800
2-methylnaphthalene	0.05	1,100
2-methylphenol (2-cresol)	0.2	14,000
2-nitroaniline	0.2	NE
2-nitrophenol	0.2	NE
3,3'-dichlorobenzidine	3	54
3-nitroaniline	0.2	NE
4,6-dinitro-2-methylphenol	2	NE
4-bromophenyl phenyl ether	0.2	NE
4-chloro-3-methylphenol	0.2	NE
4-chloroaniline	0.2	120
4-chlorophenyl phenyl ether	0.5	NE
4-methylphenol	0.2	NE
4-nitroaniline	0.5	1,100
4-nitrophenol	2	NE
acenaphthene	0.05	16,000
acenaphthylene	0.05	16,000
aniline	0.2	2,000
anthracene	0.05	81,000
azobenzene	0.2	NE
benzidine	3	NE
benzo(a)anthracene	0.05	52
benzo(a)pyrene	0.05	5.2
benzo(b)fluoranthene	0.05	52
benzo(g,h,i)perylene	0.05	8,100
benzo(k)fluoranthene	0.05	520
benzoic acid	5	100,000
benzyl alcohol	0.2	28,000
bis(2-chloroethoxy)methane	0.2	NE
bis(2-chloroethyl)ether	0.2	28
bis(2-chloroisopropyl) ether	0.2	NE
bis(2-ethylhexyl)phthalate	0.5	1,700
butyl benzyl phthalate	0.5	13,000
carbazole	0.2	870
chrysene	0.05	5,200
dibenzo(a,h)anthracene	0.05	5.2
dibenzofuran	0.05	330

SVOCs in Soil by EPA Method 8270D		
Analyte	**Laboratory Practical Quantitation Limit**	**Comparison Criteria[1]**
		Recreator Sediment
diethyl phthalate	0.5	100,000
dimethylphthalate	0.5	NE
di-n-butylphthalate	0.5	NE
di-n-octyl phthalate	0.5	NE
fluoranthene	0.05	11,000
fluorene	0.05	11,000
hexachlorobenzene	0.2	20
hexachlorobutadiene	0.2	350
hexachlorocyclopentadiene	1	NE
hexachloroethane	0.2	250
indeno(1,2,3-cd)pyrene	0.05	52
isophorone	0.5	26,000
naphthalene	0.05	5,400
nitrobenzene	0.2	NE
N-nitrosodimethylamine	0.2	5,000
N-nitroso-di-N-propylamine	0.2	NE
pentachlorophenol	1	46
phenanthrene	0.05	8,100
phenol	0.2	85,000
pyrene	0.05	8,100

Notes:

All values are in milligrams per kilogram (mg/kg)

PQLs from Absolute Resource Associates of Portsmouth, New Hampshire

1 - Maine Department of Environmental Protection (DEP) Remedial Action Guidelines (RAGs) for Sites Contaminated with Hazardous Substances, October 19, 2018.

NE = Regulatory guideline not established

VOCs in Groundwater by EPA Method 8260C			
Analyte	**Laboratory Practical Quantitation Limit**	**Comparison Criteria**	
		Residential[1]	**Construction Worker[1]**
1,1,1,2-tetrachloroethane	2	5.7	620
1,1,1-trichloroethane	2	8,000	29,000
1,1,2,2-tetrachloroethane	2	**0.76**	90
1,1,2-trichloroethane	2	**0.42**	12
1,1-dichloroethane	2	28	2,200
1,1-dichloroethene	1	290	390
1,1-dichloropropene	2	NE	NE
1,2,3-trichlorobenzene	2	7	2,900
1,2,3-trichloropropane	2	**0.0075**	2.1
1,2,4-trichlorobenzene	2	4	140
1,2,4-trimethylbenzene	2	56	1,000
1,2-dibromo-3-chloropropane (DBCP)	2	**0.0033**	1.2
1,2-dibromoethane (EDB)	2	**0.075**	8.7
1,2-dichlorobenzene	2	300	12,000
1,2-dichloroethane	2	**1.7**	140
1,2-dichloropropane	2	8.3	180
1,3,5-trimethylbenzene	2	60	1,100
1,3-dichlorobenzene	2	300	6,200
1,3-dichloropropane	2	370	100,000
1,4-dichlorobenzene	2	4.8	400
1,4-dioxane	50	**4.6**	8,600
2,2-dichloropropane	2	NE	NE
2-butanone (MEK)	10	5,600	9,000
2-chlorotoluene	2	240	3,300
2-hexanone	10	38	240
4-chlorotoluene	2	250	100,000
4-isopropyltoluene	2	NE	NE
4-methyl-2-pentanone (MIBK)	10	6,300	5,800
acetone	50	14,000	100,000
benzene	2	4.6	350
bromobenzene	2	62	1,200
bromochloromethane	2	83	600
bromodichloromethane	1	1.3	130
bromoform	2	33	5,500
bromomethane	2	7.6	490
carbon disulfide	2	810	3,100
carbon tetrachloride	2	4.6	700
chlorobenzene	2	78	2,600
chloroethane	2	NE	NE
chloroform	2	2.2	170
chloromethane	2	190	11,000
cis-1,2-dichloroethene	2	35	3,700

VOCs in Groundwater by EPA Method 8260C			
Analyte	**Laboratory Practical Quantitation Limit**	**Comparison Criteria**	
		Residential[1]	**Construction Worker[1]**
cis-1,3-dichloropropene	2	4.7	200
dibromochloromethane	2	8.7	53,000
dibromomethane	2	8.3	280
dichlorodifluoromethane	2	200	5,400
diethyl ether	5	NE	NE
ethylbenzene	2	15	1,400
hexachlorobutadiene	1	1.4	230
isopropylbenzene (cumene)	2	450	500
m&p-xylenes	2	190	2,100
methyl t-butyl ether (MTBE)	2	140	13,000
methylene chloride	5	110	4,900
naphthalene	5	**1.7**	19
n-butylbenzene	2	1,000	100,000
n-propylbenzene	2	660	4,900
o-xylene	2	190	2,100
sec-butylbenzene	2	2,000	100,000
styrene	2	1,200	15,000
tert-butylbenzene	2	NE	NE
tetrachloroethene (PCE)	2	41	260
tetrahydrofuran (THF)	10	3,400	16,000
toluene	2	1,100	24,000
trans-1,2-dichloroethene	2	300	3,900
trans-1,3-dichloropropene	2	NE	NE
trichloroethene (TCE)	2	3	12
trichlorofluoromethane	2	5,200	5,900
vinyl chloride	2	**0.19**	0.22

Notes:

All values are in micrograms per liter (µg/L)
PQLs from Absolute Resource Associates of Portsmouth, New Hampshire

1 - Maine Department of Environmental Protection (DEP) Remedial Action Guidelines (RAGs) for Sites Contaminated with Hazardous Substances, October 19, 2018.

2 - Maine Center for Disease Control Maximum Exposure Guidelines (MEGs) for Drinking Water, October 19, 2012.

* - United States Environmental Protection Agency Regions 3, 6, and 9. (accessed June 2017). Regional Screening Levels for Chemical Contaminants at Superfund Sites (Residential Soil). http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm

BOLD - laboratory PQL exceeds regulatory guideline. PQL will be considered regulatory guideline unless the compound is identified as a contaminant of potential concern.

VOCs in Soil by EPA Method 8260C		
Analyte	Laboratory Practical Quantitation Limit	Comparison Criteria[1]
		Recreator Sediment
1,1,1,2-tetrachloroethane	0.1	1,200
1,1,1-trichloroethane	0.1	100,000
1,1,2,2-tetrachloroethane	0.1	160
1,1,2-trichloroethane	0.1	550
1,1-dichloroethane	0.1	5,500
1,1-dichloroethene	0.1	18,000
1,1-dichloropropene	0.1	NE
1,2,3-trichlorobenzene	0.1	280
1,2,3-trichloropropane	0.1	0.23
1,2,4-trichlorobenzene	0.1	1,100
1,2,4-trimethylbenzene	0.1	3,500
1,2-dibromo-3-chloropropane (DBCP)	0.1	8.6
1,2-dibromoethane (EDB)	0.1	16
1,2-dichlorobenzene	0.1	32,000
1,2-dichloroethane	0.1	340
1,2-dichloropropane	0.1	840
1,3,5-trimethylbenzene	0.1	3,500
1,3-dichlorobenzene	0.1	32,000
1,3-dichloropropane	0.1	7,000
1,4-dichlorobenzene	0.1	5,800
1,4-dioxane	0.1	310
2,2-dichloropropane	0.1	NE
2-butanone (MEK)	0.3	100,000
2-chlorotoluene	0.1	7,000
2-hexanone	0.5	1,800
4-chlorotoluene	0.1	7,000
4-isopropyltoluene	0.1	NE
4-methyl-2-pentanone (MIBK)	0.4	100,000
acetone	2	100,000
benzene	0.1	570
bromobenzene	0.1	2,800
bromochloromethane	0.1	100,000
bromodichloromethane	0.1	500
bromoform	0.1	4,000
bromomethane	0.2	490
carbon disulfide	0.1	35,000
carbon tetrachloride	0.1	450
chlorobenzene	0.1	7,000
chloroform	0.1	1,000
chloromethane	0.1	100,000
cis-1,2-dichloroethene	0.1	700
cis-1,3-dichloropropene	0.1	310
dibromochloromethane	0.1	370
dibromomethane	0.1	100,000

VOCs in Soil by EPA Method 8260C		
Analyte	**Laboratory Practical Quantitation Limit**	**Comparison Criteria[1]**
		Recreator Sediment
dichlorodifluoromethane	0.1	70,000
diethyl ether	0.1	NE
ethylbenzene	0.1	2,800
hexachlorobutadiene	0.1	350
isopropylbenzene (cumene)	0.1	35,000
m&p-xylenes	0.1	70,000
methyl t-butyl ether (MTBE)	0.1	17,000
methylene chloride	0.1	2,100
naphthalene	0.1	5,400
n-butylbenzene	0.1	18,000
n-propylbenzene	0.1	35,000
o-xylene	0.1	70,000
sec-butylbenzene	0.1	35,000
styrene	0.1	70,000
tert-butylbenzene	0.1	NE
tetrachloroethene (PCE)	0.1	2,100
tetrahydrofuran (THF)	0.5	100,000
toluene	0.1	28,000
trans-1,2-dichloroethene	0.1	7,000
trans-1,3-dichloropropene	0.1	NE
trichloroethene (TCE)	0.1	180
trichlorofluoromethane	0.1	100,000
vinyl chloride	0.1	0.71

Notes:

All values are in milligrams per kilogram (mg/kg)

PQLs from Absolute Resource Associates of Portsmouth, New Hampshire

1 - Maine Department of Environmental Protection (DEP) Remedial Action Guidelines (RAGs) for Sites Contaminated with Hazardous Substances, October 19, 2018.

NE = Regulatory guideline not established

VOCs in Soil by EPA Method 8260C					
Analyte	Laboratory Practical Quantitation Limit	Comparison Criteria[1]			
		Residential	Commercial Worker	Park User	Construction Worker
1,1,1,2-tetrachloroethane	0.1	30	130	410	480
1,1,1-trichloroethane	0.1	640	640	640	640
1,1,2,2-tetrachloroethane	0.1	8.9	39	88	150
1,1,2-trichloroethane	0.1	2.2	9.4	49	13
1,1-dichloroethane	0.1	53	230	980	850
1,1-dichloroethene	0.1	340	1,200	1,100	81
1,1-dichloropropene	0.1	NE	NE	NE	NE
1,2,3-trichlorobenzene	0.1	86	1,300	240	2,700
1,2,3-trichloropropane	0.1	**0.07**	1.5	0.2	4.3
1,2,4-trichlorobenzene	0.1	86	380	360	400
1,2,4-trimethylbenzene	0.1	180	220	200	220
1,2-dibromo-3-chloropropane (DBCP)	0.1	**0.078**	0.96	1.5	3.5
1,2-dibromoethane (EDB)	0.1	0.54	2.4	6.8	8.9
1,2-dichlorobenzene	0.1	360	380	370	380
1,2-dichloroethane	0.1	6.9	30	110	110
1,2-dichloropropane	0.1	23	99	420	110
1,3,5-trimethylbenzene	0.1	160	180	170	180
1,3-dichlorobenzene	0.1	290	300	290	300
1,3-dichloropropane	0.1	2,100	32,000	6,100	68,000
1,4-dichlorobenzene	0.1	39	170	770	620
1,4-dioxane	0.1	74	340	260	1,700
2,2-dichloropropane	0.1	NE	NE	NE	NE
2-butanone (MEK)	0.3	20,000	28,000	25,000	11,000
2-chlorotoluene	0.1	2,100	32,000	6,100	800
2-hexanone	0.5	290	2,000	1,000	300
4-chlorotoluene	0.1	2,100	32,000	6,100	68,000
4-isopropyltoluene	0.1	NE	NE	NE	NE
4-methyl-2-pentanone (MIBK)	0.4	3,400	3,400	3,400	3,300
acetone	2	52,000	100,000	81,000	98,000
benzene	0.1	17	75	230	240
bromobenzene	0.1	380	650	530	620
bromochloromethane	0.1	220	940	4,000	330
bromodichloromethane	0.1	4.4	19	83	70
bromoform	0.1	280	790	720	890
bromomethane	0.2	10	45	160	120
carbon disulfide	0.1	690	740	720	720
carbon tetrachloride	0.1	9.7	43	150	160
chlorobenzene	0.1	410	740	680	740
chloroform	0.1	4.7	21	97	75
chloromethane	0.1	160	690	1,300	1,300
cis-1,2-dichloroethene	0.1	200	1,400	480	1,400
cis-1,3-dichloropropene	0.1	27	120	210	120
dibromochloromethane	0.1	110	530	320	3,000
dibromomethane	0.1	35	150	800	190

VOCs in Soil by EPA Method 8260C					
Analyte	Laboratory Practical Quantitation Limit	Comparison Criteria[1]			
		Residential	Commercial Worker	Park User	Construction Worker
dichlorodifluoromethane	0.1	130	550	830	730
diethyl ether	0.1	NE	NE	NE	NE
ethylbenzene	0.1	86	380	400	470
hexachlorobutadiene	0.1	15	16	16	17
isopropylbenzene (cumene)	0.1	260	270	270	270
m&p-xylenes	0.1	260	260	260	260
methyl t-butyl ether (MTBE)	0.1	690	3,000	5,600	8,200
methylene chloride	0.1	490	2,500	1,200	1,900
naphthalene	0.1	57	250	1,300	130
n-butylbenzene	0.1	5,400	80,000	15,000	34,000
n-propylbenzene	0.1	260	260	260	260
o-xylene	0.1	260	260	260	260
sec-butylbenzene	0.1	11,000	100,000	30,000	34,000
styrene	0.1	830	870	860	860
tert-butylbenzene	0.1	NE	NE	NE	NE
tetrachloroethene (PCE)	0.1	120	160	150	85
tetrahydrofuran (THF)	0.5	26,000	100,000	100,000	20,000
toluene	0.1	750	810	790	820
trans-1,2-dichloroethene	0.1	990	1,800	1,400	1,200
trans-1,3-dichloropropene	0.1	NE	NE	NE	NE
trichloroethene (TCE)	0.1	6.1	28	77	3.9
trichlorofluoromethane	0.1	32,000	100,000	91,000	940
vinyl chloride	0.1	0.64	24	0.71	63

Notes:

All values are in milligrams per kilogram (mg/kg)

PQLs from Absolute Resource Associates of Portsmouth, New Hampshire

1 - Maine Department of Environmental Protection (DEP) Remedial Action Guidelines (RAGs) for Sites Contaminated with Hazardous Substances, October 19, 2018

NE = Regulatory guideline not established

BOLD - laboratory PQL exceeds regulatory guideline. PQL will be considered regulatory guideline unless the compound is identified as a contaminant of potential concern.