Phase I Remediation – Design Pilot Study

Former Collins Property
Environmental Restoration Project E645045

Town of Oswegatchie
St. Lawrence County, New York

Prepared For

Town of Oswegatchie
51 State Street
P.O. Box 134
Heuvelton, New York 13654

July 2021
Revised August 2021

Barton&Loguidice

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New York State Assistance Contract No. C303433

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51 State Street
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and

New York State Department of Environmental Conservation
Region 6
317 Washington Street
Watertown, New York 13601-3787

Prepared By:

Barton & Loguidice, D.P.C.
443 Electronics Parkway
Syracuse, New York 13088

Certification Statement

I, the undersigned Engineer, certify that I am currently a NYS Registered Professional Engineer. This Pilot Study Work Plan was prepared in accordance with all applicable statutes and regulations, and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Scott D. Nostrand, P.E.
NYS P.E. No. 075454

August 31, 2021
Date

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1.0 INTRODUCTION

On behalf of the Town of Oswegatchie (Town), Barton & Loguidice D.P.C. (B&L), has prepared this Phase I Remediation – Design Pilot Study (DPS) for the remediation of petroleum contaminated soil encountered at the Former Collins Property historical petroleum bulk storage facility (the Site) located at 7610 State Highway (also known as 520 Riverside Drive) in the Town of Oswegatchie, St. Lawrence County, New York (Figure 1). The Site is a part of the Environmental Restoration Project funded in part by the 1996 Clean Water/Clean Air Environmental Bond Act (State Assistance Contract No. C303433). The Environmental Restoration Program is regulated by the New York State Department of Environmental Conservation (NYSDEC). Based on the findings of previous site investigations and as presented in B&L's Site Investigation/Remedial Alternatives Report (SIRAR) dated July 2012, two areas of petroleum-contaminated soil have been identified, which are referred to herein as Area of Concern #1 (AOC #1) and Area of Concern #2 (AOC #2). Remedial Alternatives were developed and evaluated against the remedy selection criteria presented in 6 NYCRR Part 375-1.8(f) and presented in the SIRAR. As defined in the SIRAR and the NYSDEC in the Record of Decision for the site (Appendix A), the selected remedial alternative consists of the excavation and mechanical aeration on-site to promote bioremediation of petroleum-contaminated soil in defined AOCs #1 and #2.

Prior to the full design of the remedy, the Town will perform a phase 1 remediation which includes a pilot study to evaluate the effectiveness of the selected technology. The pilot study will:

a) Remove the contaminated soil from the neighboring off-site Haggerty parcel,

b) Pilot test the remedial treatment approach, and

c) Obtain treated soils that meet the goals of the ROD and are suitable for use as backfill for Phase 2 of the project to be conducted during 2022 construction season. Specifically, the ROD goals are to meet the unrestricted soil cleanup goals for off-site and the restricted residential use for on-site.

This DPS describes the goals of the study, the steps to be taken to implement the study, and how data collected will be evaluated.

1.1 Site Description and Background

The Site is currently owned by the Town of Oswegatchie. The 5.4-acre parcel is situated on the northwest side of Highway 68 and southeast of the St. Lawrence River. The Site is bisected by a former right-of-way for the Former New York Central Railroad. The right-of-way is no longer owned by the New York Central Railroad and is part of the parcel. Land use in the area is mixed, including residential and commercial properties.

The site is currently vacant and contained mixed vegetation, including grasses interspersed with small shrubs. Historically, the site was 6.4 acres, but a 1-acre portion of the site was sold to Brendan M. Haggerty in March 2005. The northeastern property line borders a parcel owned by the City of Ogdensburg and a residential property, while Collins-Hammond Electrical Contractors

is adjacent to the southeast. The western property line is bounded by woods and a residential lot, and the southwestern property boundary borders a vacant lot. The topography of the site slopes gradually to the northwest toward the St. Lawrence River.

1.2 Site History

The Town of Oswegatchie purchased the Former Collins Property from the Real Estate Development Company, Inc. in May, 2007. Mr. C. Joseph Collins, Mr. Clarence J. Collins, and Mr. Gary Hammond purchased the property in 1990 from Atlantic Fuels, and transferred ownership of the site to the Real Estate Development Company, Inc., in August 2004. A 1.03-acre portion of the site was sold to Mr. Brandon Haggerty in March 2005 (Haggerty Parcel), reducing the size of the subject property to 5.4-acres (Figure 2). The site was historically used as a petroleum bulk storage (PBS) facility from the late 1930s until the mid-1980s; historic owners included Atlantic Fuels, Ultramar Petroleum, Augsbury Corporation, Gulf Oil Corporation, and Esso Standard Company. The site contained nine (9) PBS tanks ranging in size from 353,000 to 3,300,000 gallons that contained gasoline, fuel oil, and kerosene.

1.3 Nature and Extent of Impacts

In the SIRAR, B&L designated two identified petroleum source areas at the site as AOC #1 and AOC #2. AOC #1 consists of former bulk storage tanks 101, 102, 103, 107, 108, and 109 (South Side Parcel), while AOC #2 consists of former bulk storage tanks 104, 105, and 106 (Riverside Parcel). The location of the two AOCs, as well as the completed test pits, soil borings, sediment samples, soil vapor locations, and monitoring wells, are shown on Figure 3.

Initial sampling of surface soils, sediments, subsurface soils, and groundwater occurred during August and September 2009. A supplemental site investigation was conducted in September 2011 to further assess the condition of surface and subsurface soils at the site. Sampling of drinking wells at the Collins-Hammond Electric property and the Bresett residential property was also conducted as part of the supplemental site investigation.

The following sections provide a summary of the nature and extent of subsurface soil and groundwater impacts identified for the Site.

1.3.1 Surface Soil and Sediment Impacts

During the 2009 and 2011 Site Investigation, twelve surface soil samples two sediment samples were collected at the site. The samples were analyzed for VOCs, SVOCs, metals, PCBs, pesticides, and chlorinated herbicides. No surface soil or sediment samples collected from the site had detections in excess of the NYSDEC Restricted Residential Use Soil Cleanup Objective (SCO) values.

1.3.2 Subsurface Soil Impacts

Twelve soil samples were collected as part of the subsurface soil boring program on August 31 and September 1, 2009. These samples were analyzed for VOCs, SVOCs, PCBs, TAL metals, Pesticides), and Chlorinated Herbicides. Petroleum impacted soil at levels that exceed the NYSDEC Restricted Residential Use Soil Cleanup Objective (SCO) values and Protection of Groundwater (POG) were observed in B-1, located within the footprint of former Tank 108. Chromium was also detected in B-1 at a concentration above Part 375 Protection of Groundwater SCO. No other exceedances were observed at the site, including along the former petroleum pipeline or near other former tank locations.

During the September 2011 supplemental site investigation, ten additional subsurface soil samples were collected for laboratory analysis for VOCs and SVOCs based on field observations by B&L personnel and on-site NYSDEC staff. No samples collected from the test pits had detections in excess of the NYSDEC Protection of Groundwater SCO values.

The detected SVOC compounds that exceeded the Part 375 Restricted Residential and Protection of Groundwater SCOs during the 2009 investigation are summarized below:

Soil Boring NYSDEC Standards Exceedances:
Semi-Volatile Organic Compounds (EPA Method 8270) and Metals (EPA Method 6010B)

Parameter	NYSDEC Part 375 Restricted Residential SCOs (ppm)	NYSDEC Part 375 Protection of Groundwater (ppm)	Soil Boring Samples (ppm) B-1 (4-8')
SVOCs (EPA Method 8270)			
Benzo(a)anthracene	1	1	40
Benzo(a)pyrene	1	22	30
Benzo(b)fluoranthene	1	1.7	30
Benzo(k)fluoranthene	3.9	1.7	30
Chrysene	3.9	1	40
Indeno(1,2,3-cd)pyrene	0.5	8.2	20
Metals (EPA Method 6010B)			
Chromium	180	19	19.3

1.3.3 Groundwater Impacts

Three temporary monitoring wells and one existing monitoring well were sampled for VOCs, SVOCs, metals, PCBs, pesticides, and chlorinated herbicides during the 2009 investigation. The existing well (historic MW-2), located on the South Side Parcel near the former New York Central Railroad right-of-way, had concentrations of VOCs and SVOCs above NYSDEC groundwater standards. Each of the temporary wells and Historic MW-2 had exceedances of bis(2-ethylhexyl)phthalate (typically a laboratory artifact), and metals. The bis(2-ethylhexyl)phthalate concentration detected at Historic MW-2, however, is sufficiently elevated to conclude that it is likely present in the sample and it cannot be attributed to laboratory artifacts. None of the wells exhibited PCB, pesticide, or herbicide contamination. The metal exceedances may be largely attributable to the turbidity of the groundwater as metals may adhere to particulates in the water, and the samples may not be indicative of actual groundwater quality. Although turbidity was not directly measured during the sampling event, each of the temporary well samples were noted on the field data sheets as discolored, with fine material and/or sediment present in the sample.

The following table illustrates the contaminant concentrations that exceeded the NYSDEC Groundwater Standards from the site's temporary monitoring well samples:

Temporary Monitoring Well Groundwater NYSDEC Standards Exceedances: Volatile and Semi-Volatile Organic Compounds (EPA Methods 8260 and 8270) and Metals (EPA Method 6010B)

Parameter	NYSDEC Part 703 Groundwater Standard (ppb)	Temporary Monitoring Well Samples (ppb)			
		TW-1	TW-2	TW-3	Historic MW-2
Volatile Organic Compounds (EPA Method 8260)					
1,2,4-Trimethylbenzene	5	ND	ND	ND	**360**
1,3,5-Trimethylbenzene	5	ND	ND	ND	**68**
Ethylbenzene	5	ND	ND	ND	**43**
m,p-Xylene	5	ND	ND	ND	**250**
n-Propylbenzene	5	ND	ND	ND	**35**
o-Xylene	5	ND	ND	ND	**30**
Semi-Volatile Organic Compounds (EPA Method 8270)					
Bis(2-ethylhexyl)phthalate	5	**9**	**7**	**15**	**500**

Temporary Monitoring Well Groundwater NYSDEC Standards Exceedances: Volatile and Semi-Volatile Organic Compounds (EPA Methods 8260 and 8270) and Metals (EPA Method 6010B)					
Parameter	**NYSDEC Part 703 Groundwater Standard (ppb)**	**Temporary Monitoring Well Samples (ppb)**			
		TW-1	**TW-2**	**TW-3**	**Historic MW-2**
Metals (EPA Method 6010B)					
Cadmium	5	ND	ND	ND	**32.3**
Iron	300	**2,920**	**2,540**	**7,000**	**55,700**
Magnesium	35,000	**71,900**	**53,600**	**77,500**	34,900
Manganese	300	**305**	210	**693**	**1,060**
Sodium	20,000	**32,900**	**35,500**	**28,300**	**20,700**

ND – Compound was analyzed for but not detected
Items in bold exceed NYSDEC Part 703 Groundwater Standards

Permanent monitoring wells were installed on January 4-7, 2010. Groundwater samples were collected from the eight permanent monitoring wells, the three temporary wells, and Historic MW-2 on January 14, 2010 and April 22, 2010. Permanent monitoring wells were installed in the eastern corner of the South Side Parcel (MW-1), in the southern corner of the South Side Parcel (MW-2), in the center of the South Side Parcel (MW-3), at the western end of the former New York Central Railroad right-of-way (MW-4), at the eastern end of the former New York Central Railroad right-of-way (MW-5), near the center of the Riverside Parcel (MW-6 and MW-7), and in the western corner of the Riverside Parcel (MW-8).

The permanent wells, temporary wells, and Historic MW-2 were each sampled for VOCs, SVOCs, metals, PCBs, pesticides, and chlorinated herbicides. MW-3, MW-4, MW-7, and Historic MW-2 had VOC exceedances above the Part 703 Groundwater Standards, while all twelve wells sampled had metal exceedances. As with the temporary wells, the metal exceedances are likely attributable to the turbidity of the groundwater samples and may not be representative of actual groundwater quality. Each of the permanent monitoring wells sampled were described as turbid by the field sampling personnel. None of the wells exhibited PCB, pesticide, or herbicide contamination.

VOCs above Part 703 Groundwater Standards were identified in MW-3 on the South Side Parcel, in MW-4 and Historic MW-2 near the former New York Central Railroad right-of-way, and in MW-7 near the center of the Riverside Parcel. These wells are in

the vicinity of former petroleum bulk storage tanks at the site; however, only limited exceedances of Part 375 standards were encountered in subsurface soils. It appears that impacts to groundwater at the site may be from a source not encountered during the subsurface investigation or from an off-site source. The metals detected in the groundwater are likely attributable to bound sediments within in the samples as a result of elevated sample turbidity.

Volatile organic solvents were also detected at two locations in excess of relevant standards (acetone: Historic MW-2 only; methylene chloride: MW-4 and Historic MW-2). These solvents are commonly used in analytical laboratories and are frequently detected at low levels in environmental samples as a result of laboratory cross-contamination. However, the concentrations reported in the monitoring wells are sufficiently elevated to conclude that they are likely not the result of laboratory issues. Moreover, widespread detections of these constituents in soil gas were also reported (see section below), lending credence to the detections in groundwater.

The following table illustrates the contaminant concentrations that exceeded the NYSDEC Groundwater Standards from the Site's permanent monitoring well samples:

**Permanent Monitoring Well Groundwater NYSDEC Standards Exceedances:
Volatile and Semi-Volatile Organic Compounds (EPA Methods 8260 and 8270) and
Metals (EPA Method 6010B); January 14, 2010**

Parameter	NYSDEC Part 703 Groundwater Standards (ppb)	Permanent Monitoring Well Samples (ppb)											
		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	TW-1	TW-2	TW-3	Historic MW-2
Volatile Organic Compounds (EPA Method 8260)													
1,2,4-Trimethylbenzene	5	ND	ND	**33**	**48**	ND	ND	ND	ND	ND	ND	ND	**300**
1,3,5-Trimethylbenzene	5	ND	ND	**10**	**34**	ND	ND	ND	ND	ND	ND	ND	**80**
Benzene	1	ND	ND	ND	**30**	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	5	ND	ND	**16**	**95**	ND	ND	ND	ND	ND	ND	ND	**76**
Isopropylbenzene	5	ND	ND	**5**	**31**	ND	ND	**7.6**	ND	ND	ND	ND	ND
m,p-Xylene	5	ND	ND	**39**	**24**	ND	ND	**12**	ND	ND	ND	ND	**200**
n-Butylbenzene	5	ND	ND	ND	**32**	ND	ND	**8.2**	ND	ND	ND	ND	ND
n-Propylbenzene	5	ND	ND	ND	**72**	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**66**
Toluene	5	ND	ND	ND	**21**	ND	ND	ND	ND	ND	ND	ND	ND
Metals (EPA Method 6010B)													
Iron	300	75.8	**2,210**	180	**690**	60	152	**1,080**	**1,270**	**3,270**	**3,070**	**13,400**	**35,700**
Magnesium	35,000	**69,100**	**56,500**	**51,900**	**45,100**	**42,300**	**50,200**	**45,000**	**47,900**	**62,300**	**38,600**	**60,500**	**37,500**
Manganese	300	144	**317**	52.8	61.3	**589**	156	66.6	**1,170**	144	105	**408**	**1,710**
Sodium	20,000	**82,900**	**75,300**	**37,100**	**74,300**	**42,200**	**55,200**	19,800	**23,200**	**35,000**	**32,300**	**23,900**	**22,000**

ND – Compound was analyzed for but not detected

Items in bold exceed NYSDEC Part 703 Groundwater Standards

**Permanent Monitoring Well Groundwater NYSDEC Standards Exceedances:
Volatile and Semi-Volatile Organic Compounds (EPA Methods 8260 and 8270) and
Metals (EPA Method 6010B); April 22, 2010**

Parameter	NYSDEC Part 703 Groundwater Standards (ppb)	Permanent Monitoring Well Samples (ppb)											
		MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	TW-1	TW-2	TW-3	Historic MW-2
Volatile Organic Compounds (EPA Method 8260)													
1,2,4-Trimethylbenzene	5	ND	ND	**38**	**210**	ND	ND	ND	ND	ND	ND	ND	**350**
1,3,5-Trimethylbenzene	5	ND	ND	**12**	**72**	ND	ND	ND	ND	ND	ND	ND	**83**
Acetone	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**150**
Ethylbenzene	5	ND	ND	**23**	**210**	ND	ND	ND	ND	ND	ND	ND	**93**
Isopropylbenzene	5	ND	ND	**9.5**	**40**	ND	ND	ND	ND	ND	ND	ND	ND
m,p-Xylene	5	ND	ND	**37**	**51**	ND	ND	**6.3**	ND	ND	ND	ND	**220**
Methylene Chloride	5	ND	ND	ND	**130**	ND	ND	ND	ND	ND	ND	ND	**160**
n-Butylbenzene	5	ND	ND	ND	**40**	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	5	ND	ND	**7**	**100**	ND	ND	ND	ND	ND	ND	ND	**31**
o-Xylene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**63**
Metals (EPA Method 6010B)													
Arsenic	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**45.3**
Iron	300	76.2	**3,100**	**895**	**7,440**	**508**	**1,610**	**4,370**	**2,980**	**1,820**	**2,800**	**11,000**	**29,900**
Magnesium	35,000	**52,800**	**61,100**	**54,000**	**51,100**	**38,400**	**45,300**	**50,200**	**45,900**	**57,800**	**37,500**	**54,000**	33,300
Manganese	300	13.7	189	63.2	78.7	**536**	183	54.7	**1,210**	85.7	94.6	282	**1,400**
Sodium	20,000	**54,800**	**90,800**	**41,400**	**76,700**	**42,000**	**55,000**	**20,400**	**22,800**	**34,800**	**30,900**	**23,800**	20,800

ND – Compound was analyzed for but not detected

Items in bold exceed NYSDEC Part 703 Groundwater Standards

1.3.4 Soil Vapor Impacts

B&L collected samples from ten soil vapor points along the site boundaries, as well as an ambient air location and analyzed them for VOCs by EPA Method TO-15. The soil vapor survey revealed elevated levels of VOCs at all soil vapor points, particularly at VP-5, VP-06, and VP-07 on the Riverside Parcel. Elevated VOC compounds included BTEX compounds and others such as tetrachloroethene and acetone. Acetone and toluene were notably elevated (greater than 1,000 $\mu g/m^3$ in all but one soil vapor samples). NYSDEC does not have any standards for soil vapor.

1.4 Selected Remedy

The Record of Decision (ROD) for the site calls for petroleum impacted soil to be excavated and staged followed by mechanical aeration to promote bioremediation. Clean overburden soils will be removed in order to access the petroleum impacted soils that are present at depths ranging from 4 to 8 feet below grade. The mechanical soil turning will continue until there is no visual, olfactory or photo-ionization detector readings. Treated soils are to be placed back into the excavation at their original depth of approximately 4 to 8 feet below grade. The previously-removed overburden soils will be placed over the treated soils to create a cover system that is suitable for restricted residential use.

1.5 Pilot Study Description and Objectives

The objectives of the pilot study, as summarized in the introduction, are:

a) Remove the contaminated soil from the neighboring off-site Haggerty parcel,

b) Pilot test the remedial treatment approach,

c) Obtain treated soils that meet the goals of the ROD and are suitable for use as backfill for Phase 2 of the project to be conducted during 2022 construction season, and

d) Perform confirmatory soil sampling on both mechanically turned soils and unexcavated sidewall and bottom areas to verify that the restricted residential soil cleanup objectives for surface soils and the protection of groundwater soil cleanup objectives for soils at depths (greater than 2 feet below grade) are achieved.

The pilot study will include removal of contaminated soil from the Haggerty Parcel and placing it on a portion of the Town-owned property prepared for pilot testing by clearing, grubbing, grading, and installation of a liner system. A portion of the excavated soil will be amended with wood chips, inorganic nutrients, and water and be mechanically turned on a regular basis to promote biodegradation.

1.5.1 Remedial Action Goals

As presented in the Record of Decision, the goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles

The remedial action goals for this site are presented as follows:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAO for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

2.0 SITE PREPARATION

2.1 Clearing and Grubbing

The site is currently covered with trees and shrubs. To enable removal of the contaminated soil, the portions of the site that eventually will be excavated for treatment will be cleared during the pilot study phase. This clearing will facilitate the later full scale treatment, and will generate wood chips needed for amending the contaminated soil. Clearing and grubbing will be performed on the areas defined as AOC #1 and AOC #2 shown on Figure 3. All removed vegetation will be chipped and stockpiled on site.

2.2 Site Grading

The site is relatively flat. However, the area where the pilot study will be performed will be graded to prevent water from running off the site, and to prevent offsite water from migrating onto the treatment area. The pilot study will be performed on the location shown on Figure 4. This area will be graded to the extent necessary to provide a flat and level native surface. The perimeter of the treatment area will be graded to form a one-foot high soil berm with a one on two slope on either side of the berm center line. A shallower ramp area (not shown) will be incorporated to allow access to the treatment area by loading and turning machines.

The proposed location of pilot testing is located over the area defined as AOC #1. Although this portion of the property is designated as contaminated and will require future treatment, the surface soils are not contaminated, and therefore a liner will be installed in the pilot treatment area. This liner will consist of 40 mil high density polyethylene.

Upon completion of grading, the disturbed area will be surveyed by a licensed surveyor to document the final elevation and treatment area prior to pilot testing.

2.3 Haggerty Parcel Excavation

An estimated 7,400 square foot (ft^2) area of the Haggerty parcel has been identified as contaminated based on visual examination of soil in test pits in this area. Staining and petroleum odors were observed at depths of up to six feet in this area. However, based on the SIRAR sampling, approximately the top 2 feet of surface soils did not show evidence of contamination. Soil from this area will be excavated and segregated. Approximately 600 cubic yards (yd^3) of clean surface soil will be stockpiled for backfill and deeper soil will be transferred to the pilot treatment area. The location of the excavation and the method of segregation is described below.

Excavation will commence in the areas near test pits TP-12, TP-14, and the TP-15 located on the edge of the Town-owned property. Soils will be excavated by depth horizons. Topsoil is assumed to be clean and will be stripped and stockpiled on the Haggerty parcel for use during site restoration following excavation. Following topsoil removal, surface soils will be excavated

first and screened by a photo ionization detector (PID) and visual and olfactory inspection. Any soil that has visual or olfactory indication of contamination, or PID readings greater than 5 ppm above background will be considered contaminated. Soils not exhibiting contamination will be stockpiled on the Haggerty property away from the excavation area. Soils exhibiting contamination will be stockpiled on the prepared pilot study test area.

Excavation will continue laterally and to depths until there is no evidence of visible contamination, odors and/or elevated photo-ionization detector readings. At this point, samples will be collected at frequency of one per 30 feet of sidewall length and one per 900 ft^2 of excavation bottom. The samples will be analyzed for VOCs (EPA Method 8260+MTBE), SVOCs (EPA Method 8270), and TAL metals (EPA Method 6010). If any of the collected samples exceed unrestricted use as outlined in Table 375-6.8(a) of NYSCRR Part 375, then additional excavation will be performed until these standards are achieved. Sampling and analysis will be performed in accordance with the Quality Assurance Project Plan (QAPP) presented in Appendix A.

The soils segregated as apparently clean will also be tested for VOCs, SVOCs, TAL metals, and Emerging Contaminants at the rate specified for clean fill input on Table 5.4(e)10 of DER-10 and the NYSDEC Part 375 Guidance for PFAS and 1,4-Dioxane. If samples exceed the unrestricted use standards of Table 375-6.8(a) or Emerging Contaminant Guidelines, then these soils will be moved to the contaminated soil stockpile. Depending on the analytical results, additional sampling may be conducted to further refine the extent of soil not meeting unrestricted SCOs.

Once sampling has been documented that unrestricted standards are achieved in the sidewalls and bottom of the excavation, the excavation hole will be backfilled with stockpiled clean soil and imported fill meeting the unrestricted use standards of Table 375-6.8(a), based on a sampling frequency described in Table 5.4(e)10 of DER-10. Additionally for all soils intended to be used as backfill in the excavation areas or on-site, will need to be sampled for Emerging Contaminants (PFAS and 1,4-Dioxane) per the DEC Sampling Guidance presented in the January 2021 Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS). The soil will be placed in two-foot lifts and compacted until the original surface elevation is achieved. The top six inches of backfill will be the topsoil segregated prior to excavation. The top soil will be seeded.

The limits of excavation and the final backfill surface will be surveyed by a licensed surveyor.

2.4 Evaluation of Stockpiled Soil

Based on an assumption that the top two feet of soil are clean and contamination is found at depths from 2 to 6 feet below ground surface, the Haggerty parcel excavation is expected to provide 1,200 yd^3 of soil for pilot testing including an assumed 10% expansion upon excavation compared to the in place volume. Nine discrete samples and 3 composite samples will be collected from the stockpiled soil and analyzed for VOCs (discrete samples) and SVOCs and metals (composite samples). This sampling will be performed to determine whether the

excavated soils exceed the SCO identified in the ROD for this site, which is the unrestricted residential values for off-site soils listed in Table 375-6.8(b) of NYSCRR Part 375. Additionally, the composite samples will be analyzed for total organic carbon (TOC) by ASTM method D2974, total petroleum hydrocarbons by EPA Method 418.1, pH, and total kjeldahl nitrogen (TKN) by EPA method 351.2. A mixture of composite soil mixed with wood chips at a 10:1 soil/wood chip ratio (by volume) will also be prepared. This mixture will be split in two with one aliquot mixed with water until saturated (allowing any free water to drain). These two samples will be submitted for moisture content analysis.

If the samples from the excavated soil are found to be below restricted residential SCOs, and do not appear to be stained or exhibit odors, consideration will be given to selecting soil from the town-owned property for performing the pilot test. However, for the purposes of this work plan, it is assumed the soil excavated from the Haggerty property is contaminated above restricted residential SCOs.

2.5 Initial Soil Mixing

Two parallel pilot studies will be performed. Both will test mixing of the soil with an Allu bucket to evaluate the performance of soil mixing. One batch of soil with amendments and one batch without.

Amendments will be added to the soil to provide the initial mix for treatment. It is assumed that about 1,200 CY of soil will be treated during the pilot study. This soil will be divided into about 630 CY for testing without amendments and about 570 CY for testing with amendments (addition of amendments will bring the volume of this portion to about 630 CY.

The following amendments will be added to the amended portion:

- Wood Chips: Wood chips would be added as a bulking agent at a rate of approximately 10% by volume. About 60 CY yards of wood chips would be added. The wood chips would be provided from the chipped material generated during clearing and grubbing.
- Commercial Fertilizer: The target ratio of Carbon/Nitrogen/Phosphorus is 100:10:1 by weight of the elements. It is assumed that the organic carbon in the wood chips serves as a bulking agent only and is not considered in this ratio. The TOC and TKN measurements of the soil taken upon excavation will be evaluated to determine how much commercial inorganic fertilizer is needed. It will be assumed that there is little to no phosphorus present. The amount of fertilizer added will be calculated during construction based on initial measurements and the particular fertilizer selected.
- Water: The target moisture content for the mix is 75% of the saturated moisture content. The unamended and saturated soil/wood chip moisture content measurements will be compared at the time of initial mixing and the amount of water

needed to bring the moisture content to 75% of saturation will be calculated and then added to the mix.

- pH: Samples of the completed mix will be analyzed for pH. It is expected that the pH will be within the target range of 6 to 9. If the pH is below 6, lime will be added to raise the pH to the target level. pH is not expected to be above 9.

The soil and the amendments will be mixed using an Allu bucket until the wood chips and moisture are visibly uniform. The mixed soil will be placed into a pile of dimensions of about 75 ft by 75 ft and about 3 feet high.

The unamended soil will be placed in a similar 75 x 75 x 3 foot pile adjacent to the amended pile.

2.6 Operation and Monitoring

The soil will be mixed once per week using an Allu bucket. The degree of mixing will be subjective but sufficient to thoroughly remix the entire soil contents each week. Any standing water present within the bermed treatment area will be re-incorporated into the soil mix.

Samples will be taken weekly for VOC, SVOC, TPH, moisture, pH, and total heterotrophic plate count analyses. VOC analyses will be performed each week on 4 discrete samples (unless no VOCs were detected in the original soil analysis) from each pile, while the rest of the analyses will be performed on a single composite sample from each pile generated from five discrete representative samples from each pile.

Weekly mixing and sampling will be continued until one of following end points:

1) SVOC concentrations drop below restricted residential SCOs for three consecutive weeks and no visible contamination or significant petroleum odors are observed, or
2) The temperature drops to as sustained average daily reading below 40 degrees Fahrenheit.

At completion of the operation, no specific closure operations are required. It is assumed that target treatment goals will be met and the handling of the treated soil will be addressed in the full scale design.

2.7 Health and Safety During Operation

During all site work the provisions of the Health and Safety Plan (HASP) provided in Appendix B will be strictly adhered to. The HASP includes a Community Air Monitoring Plan (CAMP). The CAMP will be implemented during all soil excavation activities and all initial and weekly soil mixing activities. If odors are present upon formation of the remedial mix, the VOC monitoring component of the CAMP will continue to be operated continuously until no odors are present and no VOC detections above the action levels are observed.

2.8 Reporting

At the completion of the test, B&L will prepare a report summarizing all activities performed. B&L will evaluate the results and make recommendations for preparation of the final design. The pilot study report will document the amount of soil excavated and treated, and provide the record surveys of the excavated areas on the Haggerty parcel and the preparation of the pilot treatment surface at AOC #1.

2.9 Schedule

The anticipated pilot study schedule is presented below. Scheduling estimates are subject to modification due to subcontractor availability, weather conditions, and access restrictions and other factors not evident at this time:

Activity	Weeks Following Approval of the Pilot Study Plan
Preparation of contractor procurement documents	2
Procurement of pilot study contractor	2
Haggerty parcel excavation and backfill and sample confirmation (assuming no second round of excavation is required)	2
Clearing/grubbing/grading of town-owned property	concurrent with Haggerty parcel excavation
Evaluation of excavated soil and initial soil mixing	3
Operation	TBD

Figures

Figure 1

Site Location Map

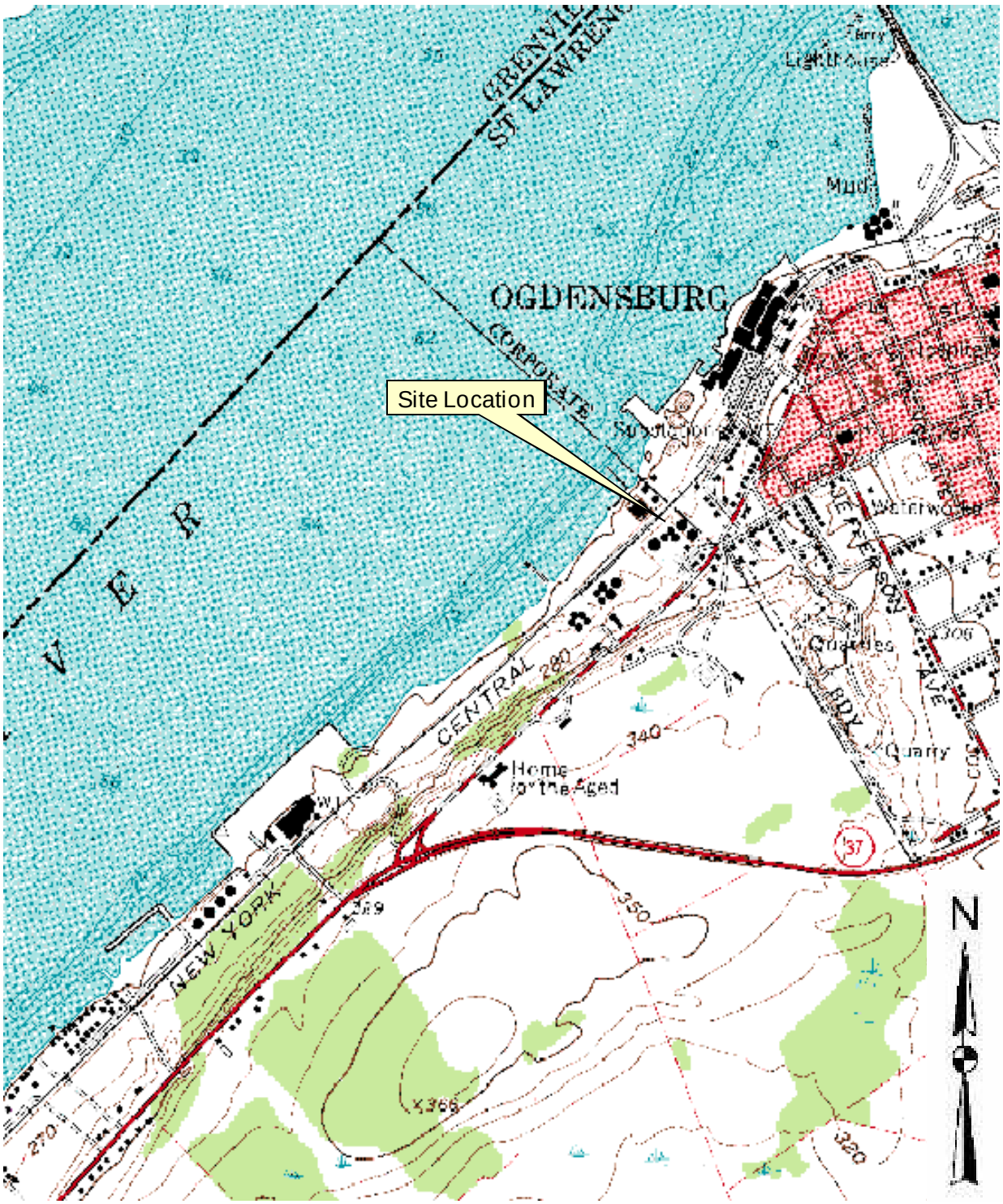


Figure 1 - Site Location

Town of Oswegatchie ERP

Town of Oswegatchie, New York

Barton & Loguidice, P.C.

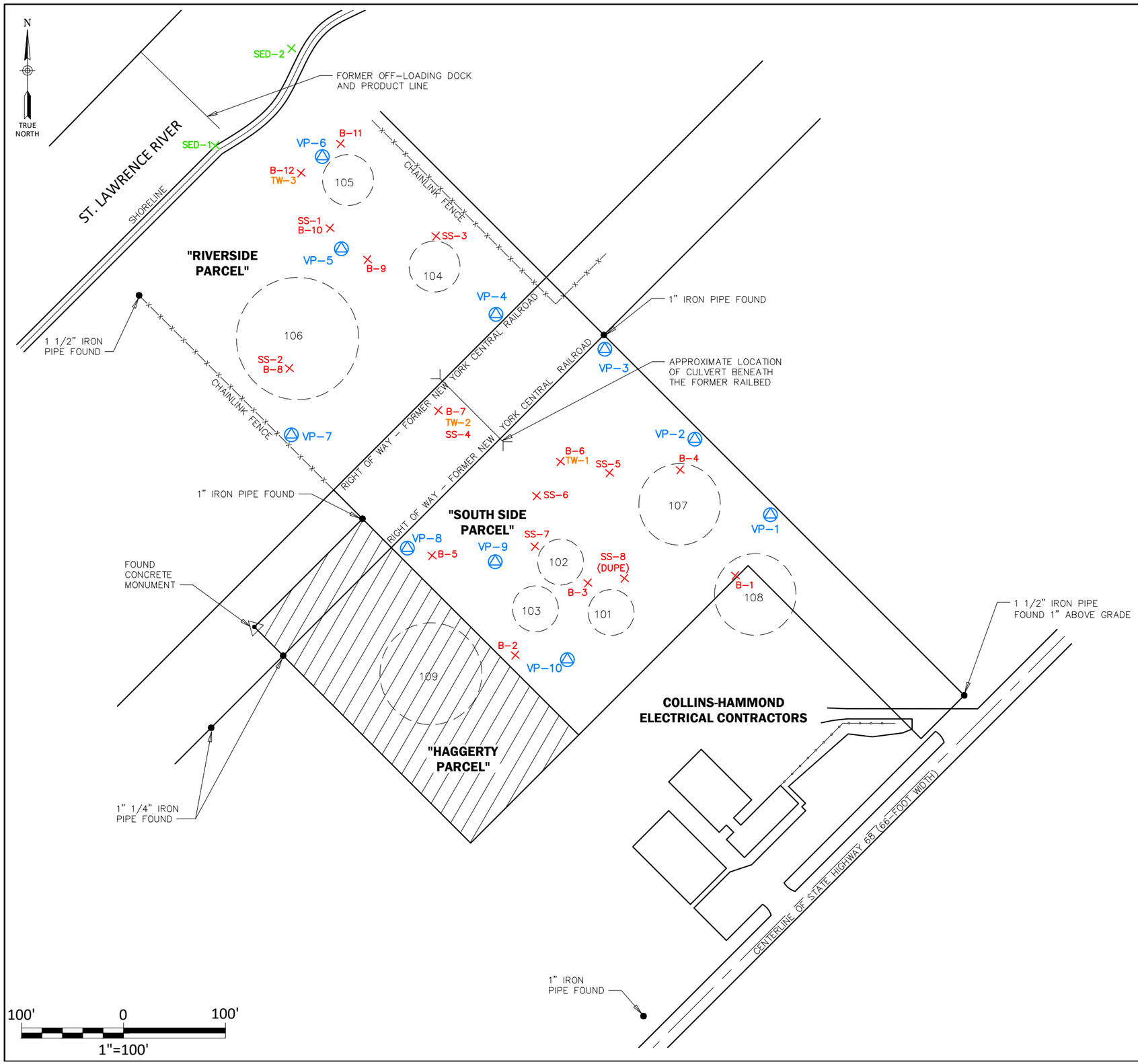
Engineers • Environmental Scientists • Planners • Landscape Designers

Base Map from USGS West Ogdensburg (1963)

1 inch = 2000 feet

Figure 2

Site Layout



LEGEND:

- 109 - FORMER PETROLEUM BULK STORAGE TANK AND I.D. NUMBER
- - PARCEL RECENTLY SOLD TO MR. BRENDAN HAGGERTY
- SS-# - SURFACE SOIL SAMPLE LOCATION
- B-# - BORING LOCATION
- TW-# - TEMPORARY WELL LOCATION
- SED-# - SEDIMENT SAMPLE LOCATION
- VP-# - SOIL VAPOR POINTS

NOTE:

ALL LOCATIONS ARE APPROXIMATE.

BASE MAP INFORMATION OBTAINED FROM ATL REPORT ENTITLED "ENVIRONMENTAL SUBSURFACE INVESTIGATION REPORT - FORMER ATLANTIC FUELS" DATED DECEMBER 22, 2004.

OSWEGATCHIE (T) BROWNFIELD PROJECT SUPPLEMENTAL INVESTIGATION SITE LAYOUT

ST. LAWRENCE COUNTY, NEW YORK

TOWN OF OSWEGATCHIE

B&L
Barton & Loguidice, D.P.C.
443 Electronics Parkway
Liverpool, NY
13088

Date
JULY 2021

Scale
1"' = 100'

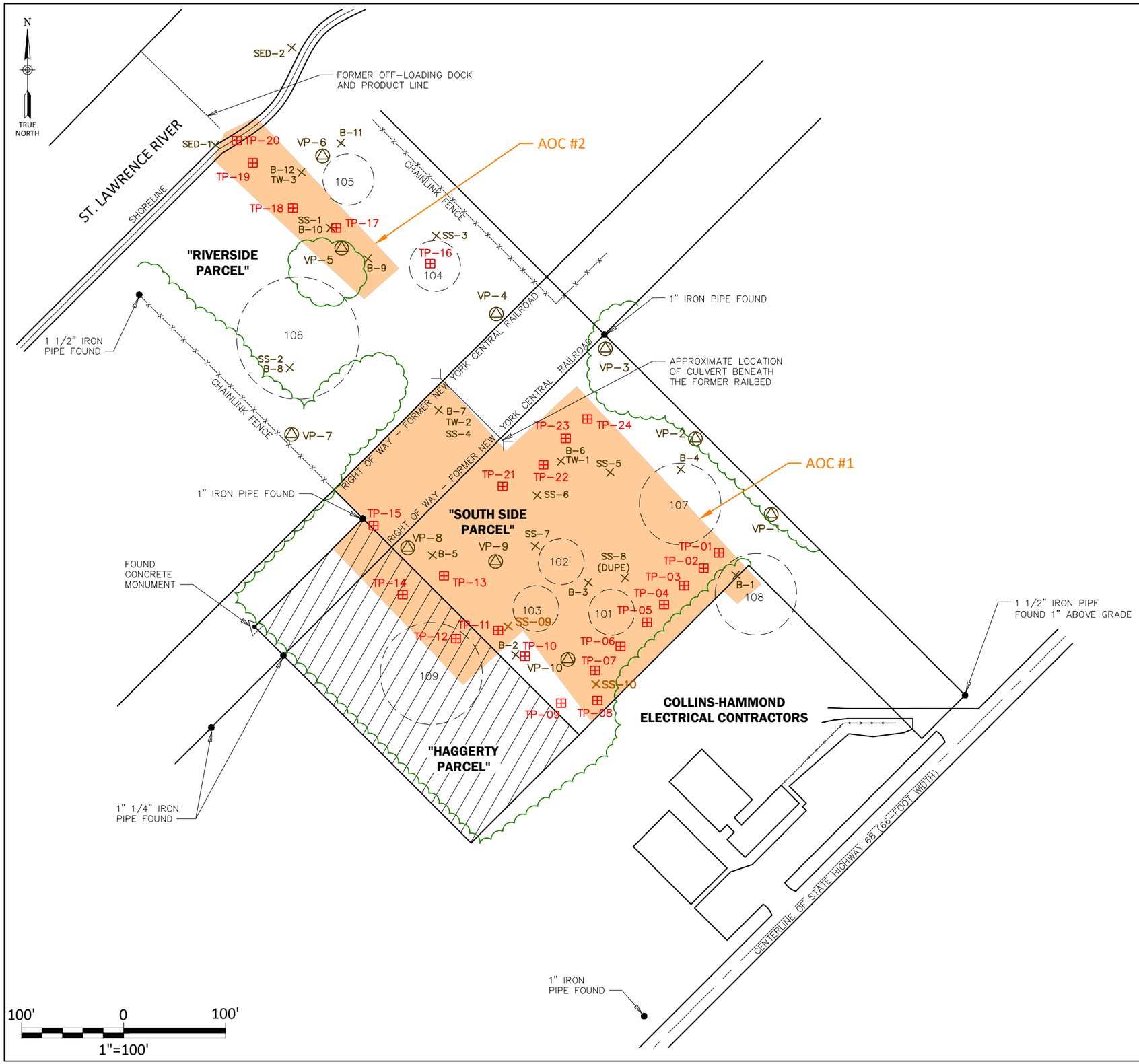
Figure Number
2

Project Number
1003.004.001

Plotted: Jul 12, 2021 - 12:18PM SYR By: WBG
Z:\BL-Vault\D2\18217AD2-1C71-4823-8927-99D5C4054147\0\2363000-2363999\2363672\L\L\1003004 Fig2 Site Layout (ID 2363672).dwg

Figure 3

AOC #1 and AOC#2 Locations



LEGEND:

- 109 - FORMER PETROLEUM BULK STORAGE TANK AND I.D. NUMBER
- PARCEL RECENTLY SOLD TO MR. BRENDAN HAGGERTY
- SS-# - SURFACE SOIL SAMPLE LOCATION
- B-# - BORING LOCATION
- TW-# - TEMPORARY WELL LOCATION
- SED-# - SEDIMENT SAMPLE LOCATION
- VP-# - SOIL VAPOR POINTS
- MW-# - MONITORING WELL LOCATION
- TP-# - 2011 TEST PIT LOCATION
- SS-# - 2011 SURFACE SOIL SAMPLE LOCATION
- APPROXIMATE TREELINE
- AREAS IDENTIFIED FOR POSSIBLE EXCAVATION

NOTE:

ALL LOCATIONS ARE APPROXIMATE.

BASE MAP INFORMATION OBTAINED FROM ATL REPORT ENTITLED "ENVIRONMENTAL SUBSURFACE INVESTIGATION REPORT - FORMER ATLANTIC FUELS" DATED DECEMBER 22, 2004.

AOC #1 AND AOC #2 LOCATIONS

OSWEGATCHIE (T)
BROWNFIELD PROJECT
SUPPLEMENTAL INVESTIGATION

ST. LAWRENCE COUNTY, NEW YORK

TOWN OF OSWEGATCHIE

Barton & Loguidice, D.P.C.
443 Electronics Parkway
Liverpool, NY
13088

Date
JULY 2021

Scale
1" = 100'

Figure Number
3

Project Number
1003.004.001

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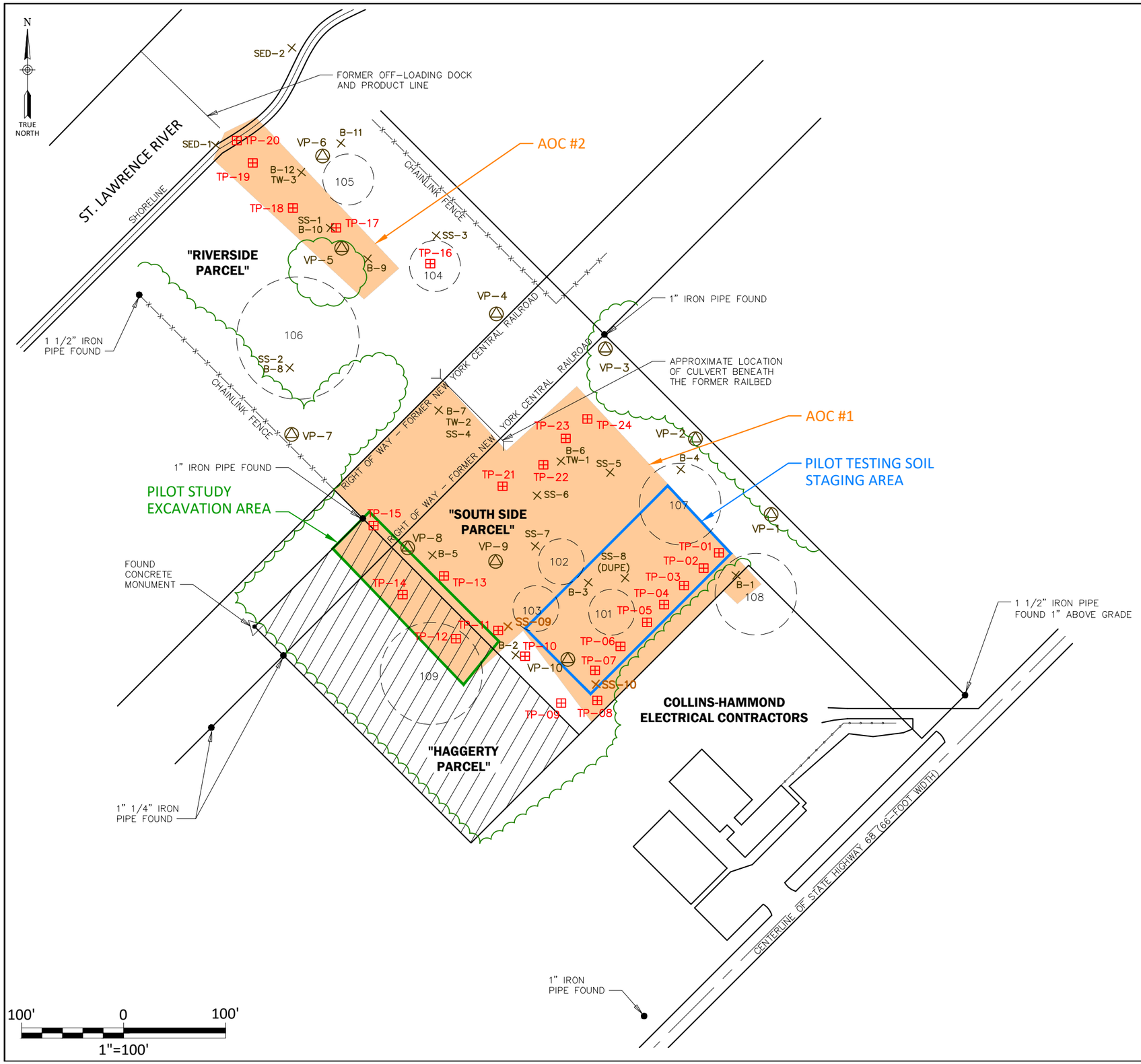
Z:\BL-Vault\D2\18217A02-1C71-4823-8927-99D5C4054147\0\2362000-2362999\2362475\LL\1003004 Fig3 AOC #1&2 Locations (ID 2362475).dwg

Figure 4

Pilot Study Area



LEGEND:

- 109 - FORMER PETROLEUM BULK STORAGE TANK AND I.D. NUMBER
- - PARCEL RECENTLY SOLD TO MR. BRENDAN HAGGERTY
- SS-# - SURFACE SOIL SAMPLE LOCATION
- B-# - BORING LOCATION
- TW-# - TEMPORARY WELL LOCATION
- SED-# - SEDIMENT SAMPLE LOCATION
- VP-# - SOIL VAPOR POINTS
- MW-# - MONITORING WELL LOCATION
- TP-# - 2011 TEST PIT LOCATION
- SS-# - 2011 SURFACE SOIL SAMPLE LOCATION
- - APPROXIMATE TREELINE
- - AREAS IDENTIFIED FOR POSSIBLE EXCAVATION

NOTE:

ALL LOCATIONS ARE APPROXIMATE.

BASE MAP INFORMATION OBTAINED FROM ATL REPORT ENTITLED "ENVIRONMENTAL SUBSURFACE INVESTIGATION REPORT - FORMER ATLANTIC FUELS" DATED DECEMBER 22, 2004.

OSWEGATCHIE (T)
BROWNFIELD PROJECT
SUPPLEMENTAL INVESTIGATION

AREA OF PILOT TESTING

ST. LAWRENCE COUNTY, NEW YORK

TOWN OF OSWEGATCHIE

Barton & Loguidice, D.P.C.
443 Electronics Parkway
Liverpool, NY
13088

Date
JULY 2021

Scale
1" = 100'

Figure Number
4

Project Number
1003.004.001

Plotted: Aug 30, 2021 - 1:48PM SYR By: WBG
Z:\BL-Vault\D2\18217AD2-1C71-4823-8927-99D5C4054147\0\2363000-2363999\2363669\L\L\1003004 Fig4 Area of Pilot Testing (ID 2363669).dwg

Appendices

Appendix A

Health and Safety Plan

Appendix A Health and Safety Plan

Former Collins Property Environmental Restoration Project

St. Lawrence County, NY

Prepared For

Town of Oswegatchie

51 State Street
Heuvelton, New York 13654

April 2021

Barton&Loguidice

Former Collins Property
Environmental Restoration Project
St. Lawrence County, New York

Appendix A

Health and Safety Plan

April 2021

Prepared For:

Town of Oswegatchie
51 State Street
P.O. Box 134
Heuvelton, New York 13654

and

New York State Department of Environmental Conservation
Region 6
317 Washington Street
Watertown, New York 13601-3787

Prepared By:

Barton & Loguidice, D.P.C.
10 Airline Drive, Suite 200
Albany, New York 12205

Table of Contents

Tables

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Attachments

1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been developed to provide both general procedures and specific requirements to be followed by Barton & Loguidice, D.P.C. (B&L) personnel while performing the Remedial Program (RP) activities at the Former Collins Property Site (the Site) in Oswegatchie, New York. This was prepared in accordance with 29 CFR 1910.120. This plan was prepared, and will be implemented, by a qualified person as defined under 29 CFR 1910.120; this is also in accordance with NYSDEC DER-10, *Technical Guidance for Site Investigation and Remediation*.

This HASP describes the responsibilities, training requirements, protective equipment, and standard operating procedures to be used by B&L personnel to address potential health and safety hazards while in work areas. This plan specifies procedures and equipment to be used by B&L personnel during work activities and emergency response to minimize exposures of B&L personnel to hazardous materials. The Plan is based on the site information available at this time and anticipated conditions to be encountered during the different phases of work. This Plan is subject to modification as data are collected and evaluated.

All personnel conducting activities on-site must comply with all applicable Federal and State rules and regulations regarding safe work practices. Personnel conducting field activities must also be familiar with the procedures, requirements and provisions of this Plan. In the event of conflicting Plans and requirements, personnel must implement those safety practices that afford the highest level of protection.

1.1 Former Collins Property Location and Description

The Former Collins Property (the Site) is located at 7610 State Highway 68 (also known as 520 Riverside Drive) in the Town of Oswegatchie, St. Lawrence County, New York. The subject site is currently owned by the Town of Oswegatchie. The 5.4-acre parcel is situated on the northwest side of Highway 68 and southeast of the St. Lawrence River. The site is bisected by a right-of-way for the Former New York Central Railroad. Land use in the area is mixed, including residential and commercial properties.

The site is currently vacant and contained mixed vegetation, including grasses interspersed with small shrubs. Historically, the site was 6.4 acres, but a 1-acre portion of the site was sold to Brendan M. Haggery in March 2005. The northeastern property line borders a parcel owned by the City of Ogdensburg and a residential property, while Collins-Hammond Electrical Contractors is adjacent to the southeast. The western property line is bounded by woods and a residential lot, and the southwestern property boundary borders a vacant lot. The topography of the site slopes gradually to the northwest toward the St. Lawrence River.

1.2 Implementation of Health and Safety Plan

The requirements and guidelines presented in this HASP are based on a review of available information and an evaluation of potential hazards. This HASP incorporates by reference the applicable Occupational Safety and Health Administration (OSHA) requirements in 29 CFR Part

1910 and 29 CFR Part 1926. The protective equipment selection was made according to Subpart I of 29 CFR 1910. B&L personnel are required to read this HASP before beginning work. This HASP will be available for inspection and review by B&L employees while work activities are underway.

When conducting the Remedial Program (RP) activities listed in the Work Plan, B&L personnel will comply with this HASP. On-site, B&L personnel will notify the B&L Site Safety and Health Coordinator (SSHC) of matters of health and safety. The SSHC is responsible to the Project Manager for monitoring activities, monitoring compliance with the provisions of this HASP, and for modifying this HASP to the extent necessary if conditions change.

This HASP is specifically intended for guiding the conduct of B&L activities defined in the Work Plan in the areas of the Former Collins Property Site specified for these work activities. Although this HASP can be made available to interested persons for informational purposes, B&L does not assume responsibility for the interpretations or activities of any persons or entities other than employees of Barton and Loguidice.

The health and safety considerations of subcontractors to B&L will be set forth in HASPs provided by each subcontractor. Documentation of the subcontractor's HASP will be obtained prior to the start of the subcontractor's work.

1.3 Project Organization

Personnel involved in the RP activities at the Former Collins Property Site implicitly have a part in implementing the HASP. Among them, the Program Manager, the Project Manager, and the SSHC have specifically designated responsibilities. Their names and telephone numbers are listed in Table 1-1. Other key B&L project personnel, the project's organization, and other primary contacts for the project are presented in the Work Plan.

Key project personnel and their responsibilities with regard to the sampling activities are discussed below.

Program Manager: Scott Nostrand, P.E., Barton & Loguidice.

Project Manager: Steve Le Fevre, P.G., Barton & Loguidice. The Project Manager is directly responsible for the technical progress and financial control of the project.

Site Safety and Health Coordinator: The B&L Site Safety and Health Coordinator (SSHC) for this investigation will be designated by the B&L Project Manager. The SSHC reports to the Project Manager, coordinates his activities with the B&L Corporate Associate for Safety and Health, and establishes operating standards and coordinates overall project safety and health activities associated with implementation of the RP field activities. The SSHC reviews project plans and revisions to plans to determine that safety and health procedures are maintained throughout the investigation. The SSHC audits the effectiveness of the HASP on a continuing basis and suggests changes, if necessary, to the Project Manager.

Specifically, the SSHC is responsible for the conducting the following actions:

- Provide a complete copy of the HASP before the start of activities;
- Familiarize workers with the HASP;
- Conduct health and safety training and briefing sessions;
- Document the availability, use, and maintenance of personal protective and other safety or health equipment;
- Maintain safety awareness among B&L employees and communicating safety and health matters to them;
- Review field activities for performance in a manner consistent with B&L policy and this HASP;
- Monitor health and safety conditions during field activities;
- Coordinate with emergency response personnel and medical support facilities;
- Notify the Project Manager of the need to initiate corrective actions in the event of an emergency, an accident, or identification of a potentially unsafe condition;
- Notify the Project Manager of an emergency, an accident, the presence of a potentially unsafe condition, a health or safety problem encountered, or an exception to this HASP;
- Recommend improvements in safety and health measures to the Project Manager; and,
- Conduct safety and health performance and system audits.

The SSHC has the authority to recommend that the Project Manager take the following actions:

- Suspend field activities or otherwise limit exposures if the health or safety of any B&L employee appears to be endangered;
- Notify B&L personnel to alter work practices that the SSHC deems to not protect them; and
- Suspend a B&L employee from field activities for violating the requirements of this HASP.

Table 1-1. Project Personnel

Name and Title	Telephone
Scott Nostrand, P.E., Program Manager	(315) 457-5200
Steve Le Fevre, P.G., Project Manager	(518) 218-1801

1.4 Project Tasks

The following tasks are identified for this project:

- General site work
- Excavation/construction oversight
- Sub-surface/surface soil sampling

Both the potential health and safety hazards and the hazard and contaminant control procedures for these tasks are discussed in the sections below.

2.0 HEALTH AND SAFETY RISK ANALYSIS

2.1 General RI Field Activity Hazards

2.1.1 Chemical Hazards

Chemical hazards that may be encountered during the remedy field implementation are related to inhalation, ingestion, and skin exposure to constituents of potential concern (COPCs). COPCs may include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals (cadmium, chromium, copper, lead, mercury, nickel, zinc, sodium, and iron).

The potential for unprotected personnel for inhalation of constituents during intrusive field activities is low to moderate. The potential for unprotected personnel for dermal contact with soils, sediments or water containing COPCs during excavation and sampling operations is moderate to high. Proper use of personnel protective equipment is intended to reduce potential exposure to contaminants.

2.1.2 Environmental and Physical Hazards

Prior to initiating activity, the work conditions will be discussed with all employees. Hazards will be identified and protective measures will be explained.

A list of Environmental and Physical hazards associated with the site are:

1. *Slip, Trip, and Fall During All Activities (Uneven Terrain):* The site contains numerous potential safety hazards such as pits, broken glass, slippery surfaces and fire debris. The work itself may be a potential safety hazard. Site personnel should constantly look out for potential safety hazards and should immediately inform the SSHC of any new hazards.
2. *Excavation Debris:* Excavation projects pose potential safety hazards from materials falling from the excavator as they are removed from the working excavation. The excavation work is a potential safety hazard and the SSHC will provide oversight during demolition activities.
3. *Moving Parts of Heavy Equipment:* Heavy equipment poses dangers though moving parts. Where feasible, access to moving parts will be guarded and equipment will be equipped with backup alarms.
4. *Noise from Heavy Equipment: Work around large equipment often creates excess noise. Engineering controls and personal protective equipment will be used to protect employees' hearing.*

5. *Electrical Hazards: As in all site work, overhead power lines, buried power lines, electrical wires and cables, site electrical equipment, and lightning also pose a potential hazard to site workers. Site personnel should constantly look out for potential safety hazards and should immediately inform the SSHC of any new hazards.*
6. *Biological Hazards (Insects, Poison Ivy, etc.): Other biological hazards that may be present at the site include rodents and insects. PPE can reduce the potential for exposure. The SSHC can assist in determining the correct PPE for the hazard present.*

2.1.3 Hazard and Contaminant Control

Protective equipment will include boots with good treads and personnel will be reminded to remain alert of the area where they are walking to decrease the chance of slipping. Eye protection will be worn to minimize splashing into eyes.

The primary hazards for contaminant exposure for each task are summarized on Table 2-1. If odors are observed during field activities, air monitoring with a PID should be conducted to evaluate the concentrations that are present. Action levels for upgrading PPE are presented in Section 6.2.

Field equipment will be inspected and in proper working condition. Mechanical assistance will be provided for large lifting tasks. Ground Fault Circuit Interrupter (GFCI) will be used on all electric power tools and extension cords in outdoor work locations. Electrical extension cords will be protected or guarded from damage (i.e., cuts from other machinery) and be maintained in good condition.

Table 2-1. Assessment of Chemicals of Potential Concern						
Chemical Name	**PEL/TLV**	**Other Pertinent Limits (Specify)**	**Warning Properties – Odor Threshold**	**Potential Exposure Pathways**	**Acute Health Effects**	**Chronic Health Effects**
Decontamination Materials:						
Isopropyl Alcohol (for decontamination, if necessary)	400 ppm/ 400 ppm	STEL = 500 ppm IDLH = 2000 ppm	Colorless liquid with the odor of rubbing alcohol	Inhalation, Absorption, Ingestion, Contact	Eye, skin & respiratory irritation; headache, drowsiness, dizziness, dry cracking skin	Dermatitis
Methanol (for decontamination, if necessary)	200 ppm/ 200 ppm	IDLH = 6000	Colorless liquid with a pungent odor – 141 ppm	Inhalation, Absorption, Ingestion, Contact	Irritation of eyes, skin, respiratory system, headache, drowsiness, dizziness, vertigo, light-headedness, nausea, vomiting, visual disturbances	Optic nerve damage, dermatitis, damage to respiratory system and GI tract
VOCs:						
Benzene	1 ppm/ 0.5 ppm	STEL=5 ppm IDLH=500 ppm	Colorless to light yellow liquid with an aromatic odor – 8.65 ppm	Inhalation, Absorption, Ingestion, Contact	Eye, skin, nose & respiratory irritation; nausea, headache, staggered gait, fatigue, anorexia, weakness, exhaustion	Carcinogen, dermatitis, bone marrow depression, damage to the eyes, respiratory system. CNS
Ethylbenzene	100 ppm/ 100 ppm	STEL = 125 ppm IDLH = 800 ppm	Colorless liquid with an aromatic odor	Inhalation, Absorption, Ingestion, Contact	Eye, skin & respiratory irritation; CNS effects; headache	Dermatitis; CNS effects;
Methyl ethyl ketone (MEK, 2-butanone)	200 ppm/ 200 ppm	IDLH = 3000 ppm	Colorless liquid with a moderately sharp, fragrant, mint-or acetone-like odor	Inhalation, Absorption, Ingestion, Contact	Eye, skin & respiratory irritation; depression; CNS effects	Eyes; respiratory system; dermatitis; CNS; liver and kidneys
Tetrachloroethene	100 ppm/ 25 ppm	C=200 ppm STEL (5 min)=300 ppm IDLH=100 ppm	Colorless to pale yellow liquid with a pungent, chloroform-like odor	Inhalation, Absorption, Ingestion, Contact	Irritation of eyes, nose, throat; nausea; flushing of face and neck; vertigo, dizziness, incoherence; headache, somnolence; skin erythema	Liver damage. Target organs: eyes, skin, respiratory system, liver, kidneys, CNS.

Table 2-1. Assessment of Chemicals of Potential Concern						
Chemical Name	**PEL/TLV**	**Other Pertinent Limits (Specify)**	**Warning Properties – Odor Threshold**	**Potential Exposure Pathways**	**Acute Health Effects**	**Chronic Health Effects**
Toluene	200 ppm/ 50 ppm	C=300 ppm STEL=150 ppm IDLH=500 ppm	Colorless liquid with a sweet, pungent, benzene-like odor	Inhalation, Absorption, Ingestion, Contact	Eye, skin & respiratory irritation; confusion, dizziness, headache	CNS effects; liver, kidney damage; dermatitis
Total Xylenes	100 ppm/ 100 ppm	STEL = 150 ppm IDLH = 900 ppm	Colorless liquid with an aromatic odor	Inhalation, Absorption, Ingestion, Contact	Eye, skin & respiratory irritation; dizziness, drowsiness, nausea, vomiting, headache, abdominal pain	Dermatitis; CNS effects; liver/kidney damage; blood
SVOCs:						
Dibenzofuran	Not available	Not available	White crystalline solid	Inhalation, Absorption, Ingestion, Contact	No information is available on the acute effects of dibenzofuran in humans or animals.	No information is available on the chronic effects of dibenzofuran in humans or animals.
4-Methyl phenol (p-cresol)	5 ppm/ 5 ppm	IDLH=250 ppm	Crystalline solid with a sweet, tarry odor (Note: liquid above 95 degree F	Inhalation, Absorption, Ingestion, Contact	Eye, skin, mucous membrane irritation; CNS effects: confusion, depression, respiratory failure; dyspnea, irregular rapid respiration, weak pulse; eye and skin burns; dermatitis.	Lung, liver, kidney, pancreas damage.
Naphthalene (and 2-methyl naphthalene)	10 ppm/ 10 ppm	IDLH=250 ppm	Colorless to brown solid with an odor of mothballs.	Inhalation, Absorption, Ingestion, Contact	Eye irritation; headache, confusion, excitement, malaise; nausea, vomiting, abdominal pain; irritated bladder; profuse sweating; jaundice, hematuria, hemoglobinuria, renal shutdown; dermatitis; optical neuritis, corneal damage.	Target organs: eyes, skin, blood, liver, kidneys, CNS.
PCBs	PEL=1 mg/m3 (42%) PEL=0.5 mg/m3 (54%) TLV=0.5 mg/m3	IDLH=5 mg/m^3	Mild hydrocarbon odor	Inhalation, Absorption, Ingestion, Contact	Eye irritation, acne, jaundice, dark urine.	Carcinogen; liver damage; reproductive effects.

Table 2-1. Assessment of Chemicals of Potential Concern						
Chemical Name	**PEL/TLV**	**Other Pertinent Limits (Specify)**	**Warning Properties – Odor Threshold**	**Potential Exposure Pathways**	**Acute Health Effects**	**Chronic Health Effects**
TAL Metals:						
Aluminum	15 mg/m^3/ 10 mg/m^3	STEL=20 mg/m^3	Odorless, silvery-white, soft, ductile, metallic solid or powder.	Inhalation, Absorption, Ingestion, Contact	Eye and respiratory tract irritation.	Lung and CNS damage.
Antimony	0.5 mg/m^3/ 0.5 mg/m^3	IDLH=50 mg/m^3	Silver-white, lustrous, hard, brittle solid; scale-like crystals; or a dark-gray, lustrous powder.	Inhalation, Absorption, Ingestion, Contact	Eye, skin, and respiratory tract irritation; cough, dizziness; headache; nausea; vomiting; diarrhea; stomach cramps.	Damage to eyes, skin, respiratory system, cardiovascular system; insomnia; anorexia; loss of sense of smell.
Arsenic	0.5 mg/m^3/ 0.01 mg/m^3	IDLH=5 mg/m^3	Silver-gray or tin-white, brittle, odorless solid.	Inhalation, Absorption, Ingestion, Contact	Ulceration of nasal septum, gastrointestinal disturbances, peripheral neuropathy.	Carcinogenic, damage to liver, kidneys, skin, lungs, and lymphatic system.
Barium	0.5 mg/m^3/ 0.5 mg/m^3	IDLH=50 mg/m^3	Soft, silvery solid; oxidizes easily in air.	Inhalation, Absorption, Ingestion, Contact	Irritation of eyes, skin, and upper respiratory system; abdominal cramps, diarrhea; vomiting; severe muscle weakness; cardiac arrhythmia; unconsciousness; respiratory arrest.	Eye, skin, respiratory system, cardiac, and CNS damage; gastrointestinal effects.
Beryllium	0.002 mg/m^3 / 0.002 mg/m^3	IDLH=4 mg/m^3	Gray-white, brittle solid.	Inhalation, Absorption, Contact	Irritation of the eyes and skin, high to extreme acute toxicity.	Berylliosis: anorexia, weight loss, weakness, chest pain, cough, cyanosis, pulmonary insufficiency; dermatitis; lung disease.
Cadmium	0.1 mg/m^3 / 0.01 mg/m^3	IDLH=9 mg/m^3	Blue-tinged silver-white, lustrous, odorless solid.	Inhalation, Ingestion	Respiratory tract irritation and high acute toxicity.	Kidney, liver, lung, bone, blood, immune system, and CNS damage.
Calcium	Not available	Not available	Semi-soft, gray, odorless solid.	Inhalation, Ingestion, Absorption, Contact	Tissue damage of eyes and skin, irritation of respiratory tract, lung damage, unconsciousness, death.	Severe lung and mucous membrane damage, dermatitis.

Table 2-1. Assessment of Chemicals of Potential Concern

Chemical Name	PEL/TLV	Other Pertinent Limits (Specify)	Warning Properties – Odor Threshold	Potential Exposure Pathways	Acute Health Effects	Chronic Health Effects
Chromium	1 mg/m^3 / 0.5 mg/m^3	IDLH =250 mg/m^3	Blue-white to steel-gray, lustrous, brittle, hard, odorless solid.	Inhalation, Ingestion, Contact	Irritation of eyes and skin.	Lung fibrosis (histologic).
Cobalt	0.1 mg/m^3 / 0.02 mg/m^3	IDLH=20 mg/m^3	Silvery, bluish-white, odorless, magnetic metal. Fume and dust is odorless and black.	Inhalation, Absorption, Ingestion, Contact	Irritation of the eyes and skin, respiratory distress, nausea, vomiting, diarrhea, and a sensation of hotness.	Dermatitis, lung disease, polycythemia, hyperplasia of the bone marrow and thyroid gland, pericardial effusion, and pancreatic damage.
Copper	1 mg/m^3/ 1 mg/m^3	IDLH=100 mg/m^3	Reddish, lustrous, malleable, odorless solid.	Inhalation, Ingestion, Contact	Eye, nose, pharynx irritation; nasal perforation; metallic taste; dermatitis.	Target organs: Eyes, skin, respiratory system, liver, kidneys (increased risk with Wilson's disease).
Iron	10 mg/m^3/ 5 mg/m^3	IDLH=2500 mg/m^3	Silver to gray odorless solid, sometimes with a thin layer of reddish dust.	Inhalation, Ingestion, Contact	Irritation of the respiratory tract, gastrointestinal tract, and eyes. Liver damage and death possible with extreme ingestion.	Siderosis (lung damage), cardiac damage.
Lead	0.05 mg/m^3 / 0.05 mg/m^3	IDLH=100 mg/m^3	A heavy, gray ductile, soft solid	Inhalation, Absorption, Ingestion, Contact	Weakness, lassitude, insomnia, facial pallor	Encephalopathy, kidney disease, hypotension.
Magnesium	15 mg/m^3 / 10 mg/m^3	IDLH=750 mg/m^3	Odorless, silver-white solid.	Inhalation, Contact	Irritation of eyes and skin; metal fume fever, with chills, fever, coughing, nausea, vomiting, weakness.	Lung damage.
Manganese	5 mg/m^3 / 0.1 mg/m^3	IDLH=500 mg/m^3	Silvery, lustrous, brittle, odorless solid.	Inhalation, Ingestion	Irritation of skin.	Respiratory system, CNS, blood, kidney damage.

Table 2-1. Assessment of Chemicals of Potential Concern						
Chemical Name	**PEL/TLV**	**Other Pertinent Limits (Specify)**	**Warning Properties – Odor Threshold**	**Potential Exposure Pathways**	**Acute Health Effects**	**Chronic Health Effects**
Mercury	0.1 mg/m^3 (C)/ 0.025 mg/m^3	IDLH = 10 mg/m^3	Silver-white, odorless, heavy liquid	Inhalation, Absorption, Ingestion, Contact	Irritation of eyes; cough, chest pain, dyspnea, bronchial pneuitis; tremor, insomnia, irritability, indecision, headache, fatigue, weakness; stomatitis, salivation.	Gastrointestinal disturbances, anorexia, proteinuria. Target organs include eyes, skin, respiratory system, central nervous system, and kidneys.
Nickel	1 mg/m^3 / 1.5 mg/m^3	IDLH=10 mg/m^3	Silver-white, hard, malleable solid or powder. Odorless.	Inhalation, Absorption, Ingestion, Contact	Irritation of the skin and respiratory tract.	Sensitization leading to contact dermatitis. Human carcinogen (lung and nasal)
Potassium	Not available	Not available	Soft, odorless, silvery-white solid.	Inhalation, Absorption, Ingestion, Contact	Irritation of the skin, eyes, respiratory tract, and gastrointestinal tract.	Damage to the blood, heart, liver, kidneys, lungs, and upper respiratory tract.
Selenium	0.2 mg/m^3 / 0.2 mg/m^3	IDLH = 1 mg/m^3	Amorphous or crystalline, red to gray solid.	Inhalation, Ingestion, Contact	Eye, skin, nose, throat irritation; visual disturbances; headache, chills, fever; dyspnea, bronchitis; metallic taste, garlic breath, gastrointestinal disturbances; dermatitis; eye and skin burns.	Target organs include eyes, skin, respiratory system, liver, kidneys, blood, and spleen.
Silver	0.01 mg/m^3 / 0.1 mg/m^3	IDLH=10 mg/m^3	Silvery-white, lustrous, odorless solid.	Inhalation, Absorption, Ingestion, Contact	Irritation of the eyes, skin, gastrointestinal tract, and respiratory tract; metal fume fever.	Skin pigmentation and organ accumulation
Sodium	Not available	Not available	Light, soft, silvery, odorless solid.	Absorption, Ingestion, Contact	Irritation and inflammation of the eyes and skin.	Damage to mucous membranes and upper respiratory tract.
Thallium	0.1 mg/m^3 / 0.1 mg/m^3	IDLH=15 mg/m^3	Bluish-white, lead-like solid	Inhalation, Absorption, Ingestion, Contact	Irritation of the skin, eyes, and mucous membranes; headache; pulmonary edema; discoloration and loss of hair; albuminuria; lymphocytosis; gastrointestinal hemorrhage; nausea; vomiting.	Damage to the CNS including hallucinations, convulsions, and coma; respiratory failure; damage to the heart and kidneys; paralysis.

Table 2-1. Assessment of Chemicals of Potential Concern

Chemical Name	PEL/TLV	Other Pertinent Limits (Specify)	Warning Properties – Odor Threshold	Potential Exposure Pathways	Acute Health Effects	Chronic Health Effects
Vanadium	0.1 mg/m^3/ 0.05 mg/m^3	IDLH=35 mg/m^3	Soft, ductile, odorless, grayish-white solid.	Inhalation, Absorption, Ingestion, Contact	Irritation of the skin, eyes, and respiratory tract; nausea, vomiting, and greenish discoloration of the tongue; CNS effects like headache, dizziness, and tremors.	Damage to the kidneys and blood; respiratory effects like bronchitis and shortness of breath; asthma-like allergy may develop
Zinc	5 mg/m^3/ 2 mg/m^3	IDLH = 500 mg/m^3	Bluish-gray, lustrous, odorless solid.	Inhalation, Ingestion, Contact	Irritation of the eyes and skin; metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough, weakness; metallic taste; headache; blurred vision; vomiting; tightness in chest, dyspnea, rales, decreased pulmonary function.	Respiratory system effects such as lung damage and bronchitis. Suspected carcinogen.
Cyanide	5 mg/m^3/ 5 mg/m^3 (C)	IDLH=25 mg/m^3	White powder with a faint bitter, almond-like odor.	Inhalation, Absorption, Ingestion, Contact	Irritation of the eyes, skin, and respiratory tract; chest tightness; shortness of breath; enlargement of the thyroid; paralysis; asphyxia; death.	CNS effects like demyelination and ataxia, hypertonia; lesions of the optic nerve; Leber's optic atrophy; goiters; depressed thyroid function.

PEL = OSHA Permissible Exposure Limit; represents the maximum allowable 8-hour time-weighted average (TWA) exposure concentration.
TLV = ACGIH Threshold Limit Value; represents the maximum recommended 8-hour TWA exposure concentration.
STEL = OSHA Short-term Exposure Limit; represents the maximum allowable 15-minute TWA exposure concentration.
C = OSHA Ceiling Limit; represents the maximum exposure concentration above which an employee shall not be exposed during any period without respiratory protection.
IDLH = Immediately Dangerous to Life and Health; represents the exposure likely to cause death or immediate delayed permanent adverse health effects or prevent escape from such an environment

2.1.4 Heat and Cold Stress

Workers will be routinely observed by the SSHC for symptoms of heat stress or cold exposure, as dictated by the weather conditions and work being conducted. Heat stress and cold exposure can be avoided by periodic, regular rest breaks.

Heat stress may be a potential hazard for personnel wearing PPE, particularly working in hot and humid conditions. Workers should take regular rest breaks within a shaded area, removing their PPE, and drink electrolyte replacing liquids and/or water. The SSHC is responsible for scheduling the amount of time each individual can work under the existing site conditions, and how often and how long they will break. Workers will be required to take their breaks in the support zone after going through the decontamination area, or they may undergo partial decontamination and rest in a clean area within the decontamination/buffer area. Please refer to Section 7 (Site Control) of this HASP for a detailed description of the above referenced support zone and decontamination area/buffer zone.

2.2 Surface Water and Sediment Sampling

Samples of surface water and sediments might be collected for subsequent analysis and evaluation of potential impacts. The physical hazards of this operation are primarily associated with the coring activities and sample collection methods and procedures utilized (if any).

Health and safety procedures for water-related work apply to the surface water and sediment sampling tasks.

2.2.1 Potential Health Hazards and Contaminants

Surface water and sediments that are collected may contain contaminants. The potential exists for release of these materials into the atmosphere at levels that may present an inhalation hazard. The contaminants may be spread through the air and absorbed through direct contact.

Other physical hazards associated with probing/coring and sampling procedures are strains/sprains resulting from sample collection, and potential eye hazards resulting from splashes during sample collection activities.

2.2.2 Hazard and Contaminant Control

General PPE requirements and guidance for upgrading level of PPE are presented in Section 2.2 apply to this task. Control of water hazards are discussed in Section 2.8.

Chemical odors may be observed during surface water and sediment probing activities. If odors are observed, field personnel should move away to prevent exposure. Generally, odors will be observed before a PID will detect exposure. If the odors do not dissipate, subsequent monitoring will be in accordance with Section 6.2 of this HASP to evaluate the proper level of protection required.

The potential for slipping on wet surfaces will be reduced by keeping work surfaces dry to the extent practicable. Also, boots with good treads will be worn and personnel will be reminded to remain alert in the area where they are walking to decrease the chance of slipping.

3.0 TRAINING PROGRAM

3.1 Hazardous Waste Operations Health and Safety Training

Employees who are assigned to perform duties on hazardous waste sites will receive the OSHA initial 40-hour health and safety training prior to on-site activities, in accordance with 29 CFR 1910.120 (e). In addition, such personnel provide documentation of having received three days of supervised field experience applicable to this site, or receive three days of supervised field experience at this site. Applicable employees will receive yearly 8-hour refresher courses. On-site managers and supervisors who are directly responsible for or who supervise workers engaged in hazardous waste operations receive, in addition to the appropriate level of worker HAZWOPER training described above, eight additional hours of specialized supervisory training, in compliance with 29 CFR 1910.120(e)(4).

Because this site is meets the definition of a hazardous waste site, employees who work during field activities are required to have completed HAZWOPER initial and refresher training.

3.2 Additional Training

As site activities change, supplemental training will be provided to employees to address changes in identified hazards, risks, operations procedures, emergency response, site control, and personal protective equipment. Specialty training will be provided as determined by task and responsibility.

Site-specific training will be provided to each employee and will be reviewed at safety briefings. Specialized training will be provided as dictated by the nature of site activities. Specialized training will be provided for activities such as the handling of unidentified substances. Employees involved in these types of activities will be given off-site instruction regarding the potential hazards involved with such activities and the appropriate health and safety procedures to be followed. Off-site instruction is meant to include any areas where employees will not be exposed to site hazards.

3.3 Emergency Response Personnel

B&L employees who respond to emergency situations involving health and safety hazards must be trained in how to respond to such emergencies in accordance with the provisions of 29 CFR 1910.120(l). Skills such as cardiopulmonary resuscitation (CPR), mouth-to-mouth rescue breathing, and basic first aid skills may be necessary. Personnel who respond to emergencies on site will be briefed on potential hazards by the SSHC before being permitted to enter the buffer and exclusion zones.

3.4 Other Required Training

Other training that may be required by workers that is in addition to required training described above is detailed below:

- Hazard communication, in accordance with 29 CFR 1910.1200
- Respirator use, in accordance with 29 CFR 1910.134
- Hearing conservation, in accordance with 29 CFR 1910.95
- Working safely around heavy equipment
- Heat and cold stress prevention
- Confined space entry, in accordance with 289 CFR 1910.146

3.5 Training Records

A record of employee training completion will be maintained by the SSHC for each B&L employee who is trained. This record will include the dates of the completion of worker training, supervisor training, refresher training, emergency response training, and specific training for on-site B&L employees. Additionally, an employee sign off sheet indicating that each worker has reviewed a copy of this HASP and understands its contents is stored at the same location.

3.6 Pre-Entry Briefing

A site-specific briefing will be provided to all individuals, including site visitors, who enter this site beyond the site entry point. For visitors, the site-specific briefing provides information about site hazards, the site lay-out including work zones and places of refuge, the emergency alarm system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

The SSHC will brief personnel as to the potential hazards likely to be encountered. Topics will include:

- Availability of this HASP.
- General site hazards and specific hazards in the work areas, including those attributable to the chemicals present.
- Selection, use, testing and care of the body, eye, hand and foot protection being worn, with the limitations of each.
- Decontamination procedures for personnel, their personal protective equipment, and other equipment used on the site.

- Emergency response procedures and requirements.
- Emergency alarm systems and other forms of notification, and evacuation routes to be followed.
- Methods to obtain emergency assistance and medical attention.

4.0 PERSONNEL PROTECTION

The basic level of personal protective equipment (PPE) to be used during field activities associated with implementation of the RP is OSHA Level D. PPE may be upgraded based on air monitoring results or at the discretion of the Project Manager and based on the SSHC's recommendations. A downgrade of PPE must be approved by the SSHC and the Project Manager.

If the SSHC determines that field measurements or observations indicate that a potential exposure is greater than the protection afforded by the equipment or procedures specified in this or other sections of this HASP, the work will be stopped. B&L personnel will be removed from the site until the exposure has been reduced or the level of protection has been increased.

B&L respirator users have been trained, medically approved, and fit tested to use respiratory protection. Respirators issued are approved for protection against dust and organic vapors by the National Institute for Occupational Safety and Health (NIOSH). Respirators are issued for the exclusive use of one worker and will be cleaned and disinfected after each use by the worker. Respirator users must check the fit of the respirator before each day's use to see that it seals properly. The respirator must seal against the face so that the wearer receives air only through the air purifying cartridges attached to the respirator. No facial hair that interferes with the effectiveness of a respirator will be permitted on personnel required to wear respiratory PPE. Cartridges and filters for air-purifying respirators in use will be changed at the end of each workday that an air-purifying respirator is worn, unless the SSHC determines that a change is not necessary.

4.1 Protective Equipment Description

The level of PPE is categorized as Level A, B, C, or D, based upon the degree of protection required. For each level, hard hats will be required if dangers related to overhead objects may be present. For drilling and test pitting activities, hard hats will be worn at all times. For other tasks, hard hats will be worn, as necessary. The following is a brief summary of the PPE levels that may be used on this site.

Level C – The concentration(s) and type(s) of airborne substance(s) is known and the criteria for using air- purifying respirators are met. The following constitute Level C equipment:

- NIOSH approved full-face air purifying respirator with organic vapor/acid gases cartridges and P100 filters;

- Chemical-resistant clothing (polyethylene coated overalls, chemical-splash suit, disposable chemical- resistant overalls) with ankles and cuffs taped closed;
- Gloves, outer, nitrile, chemical-resistant;
- Gloves, inner, nitrile, chemical-resistant;
- Shoes, with steel toe and shank meeting ANSI requirements;
- Boots, outer neoprene or Chemical resistant (latex or neoprene) boot covers;
- Hearing protection, if necessary
- Hard hat, if necessary; and
- Face shield when not wearing a full-face respirator.

Level D – A work uniform affording minimal protection, used for nuisance contamination only. The following constitute Level D equipment:

- Coveralls or other appropriate work clothing;
- Shoes, with steel toe and shank meeting ANSI requirements;
- Optional chemical resistant boot covers;
- Safety glasses or chemical splash goggles;
- Gloves, nitrile if handling wet materials;
- Hearing protection, if necessary
- Hard hat, if necessary; and
- Escape mask (optional)
- Filtering respirator (i.e., dust mask) voluntary use.

4.2 Protective Equipment Failure

If an individual experiences a failure or other alteration of PPE that may affect its protective ability, that person is to leave the work area immediately. The Project Manager or the SSHC must be notified and, after reviewing the situation, is to determine the effect of the failure on the continuation of on-going operations. If the Project Manager or the SSHC determine that the failure affects the safety of workers, the work site, or the surrounding environment, workers are to be evacuated until corrective actions have been taken. The SSHC will not allow re- entry until the equipment has been repaired or replaced and the cause of the failure has been identified.

5.0 MEDICAL MONITORING

5.1 Medical Surveillance Program

B&L has implemented a medical monitoring program in accordance with 29 CFR 1910.120, the Hazardous Waste Operations regulations and in 1910.134, the Respiratory Protection regulations. The B&L program is designed to monitor and reduce health risks to employees potentially exposed to hazardous materials and to provide baseline medical data for each employee involved in work activities. It is also designed to determine the employee's ability to wear personal protective equipment such as chemical resistant clothing and respirators. The examination may include the OSHA required Medical Questionnaire, Respirator Suitability Form, a Medical Examination, Audiology Test, Pulmonary Function Test, and testing for complete blood count and chemistry profile.

Medical examinations are administered on a post-employment and annual basis and as warranted by symptoms of exposure or specialized activities. These medical examinations and procedures are performed by or under the supervision of a licensed physician. The medical monitoring is provided to workers free of cost, without loss of pay and at a reasonable time and place. The examining physician is required to make a report to B&L of any medical condition that would increase the employee's risk when wearing a respirator or other PPE. B&L maintains site personnel medical records as required by 29 CFR 1910.120 and by 29 CFR 1910.1020, as applicable.

B&L employees performing the activities listed in the Work Plan of this document have or will receive medical tests as regulated by 29 CFR 1910.120. Where medical requirements of 29 CFR 1910.120 overlap those of 29 CFR 1910.134, the more stringent of the two will be enforced. In addition, the need to implement a more comprehensive medical surveillance program will be re-evaluated after an apparent over-exposure incident.

5.2 Respirator Clearance

Employees who wear, or may wear, respiratory protection will be provided respirators as regulated by 29 CFR 1910.134 before performing designated duties. Prior to issuance of a respirator, a medical professional must have medically certified the individual's ability to wear respiratory protection. It is not anticipated the respirator use will be required at the site.

5.3 Frequency

1. *Baseline Examinations:* Individuals who are assigned temporarily or permanently to fieldwork at hazardous waste sites or the use of a respirator will receive a baseline examination prior to job assignment.
2. *Periodic Examinations:* Individuals who are assigned temporarily or permanently to fieldwork at hazardous waste sites or the use of a respirator will receive periodic examinations as required.
3. *Termination Examinations:* Field employees permanently leaving the company who were in the medical surveillance program will receive an exit examination.
4. *Possible Exposure Examinations:* As soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards, or that an employee has been injured or exposed above the permissible exposure limits in an emergency situation, that employee will be required to receive medical attention.

6.0 COMMUNITY AIR MONITORING PLAN (CAMP)

This section of the HASP serves as the Community Air Monitoring Plan (CAMP) for the Former Collins Property Site. Monitoring described in this CAMP will be implemented during invasive Remedial Program (RP) field activities, which will include Pre-Design Investigation (PDI) soil sampling and analysis, remedial excavation, as well as loading of materials for off-site disposal.

Unidentified organic vapors and/or dust particulate may be present in the investigation areas. Real time monitoring of these substances may be conducted on-site by, or under the supervision of, the SSHC. The SSHC will evaluate whether the personal protective measures employed during field activities are appropriate and will modify the protective measures accordingly. The SSHC will be responsible to maintain monitoring instruments throughout the remedial program.

The upwind and downwind perimeter of the exclusion zone will be monitored during intrusive work. A photoionization detector (PID) will be used to monitor total volatile organic vapors while a particulate meter will monitor particulate concentrations. The monitors will be equipped with audible and visual alarms, have recorders and display 15 minute time weighted averages. All readings will be downloaded and available for New York State Department of Health (NYSDOH) and NYSDEC personnel to review at the end of the project. Action levels for organic vapors and particulate emissions are outlined in the following subsections as well as on Table 1.

Further discussion on the Community Air Monitoring Program to screen VOC levels and fugitive dust emissions have been defined in Attachment 1 of this HASP

6.1 Organic Vapors

If the 15-minute average VOC level remains below 5 ppm above background, intrusive work activities may continue. If the 15-minute average VOCs level exceeds 5 ppm above background, intrusive work activities will be suspended. Monitoring will continue under the provisions of the Vapor Emission Response Plan described below. If the 15-minute average VOCs level exceeds 25 ppm above background, intrusive work will be stopped and the Major Vapor Emissions Plan described below will be activated. Monitoring will continue under the provisions of the Major Vapor Emission Plan described below.

<u>Vapor Emission Response Plan</u>

If the vapor levels increase above 5 ppm above background at the downwind perimeter of the exclusion zone but remain below 25 ppm above background, work can resume provided:

- The source of the vapors has been identified and corrective actions have been taken to abate the emissions. These actions must reduce the exclusion zone perimeter emissions below 5 ppm.
- The organic vapor level 200 feet downwind of the work area or half of the distance to the nearest residential or commercial structure, whichever is less, is less than 5 ppm over background. If the distance to the nearest occupied building is less than 20 feet, the monitor will be placed at the perimeter of the work area.
- Continuous monitoring continues.

Major Vapor Emission Plan

If organic levels greater than 25 ppm over background are identified 200 feet downwind from the work area or half of the distance to the nearest residential or commercial property, whichever is less, all work activities at the site will be halted.

If, following the cessation of the work activities, the downwind organic levels persist above 25 ppm above background, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20-Foot Zone).

If efforts to abate the emission source are unsuccessful and if organic vapors persist at levels ≥5 ppm for more than 30 minutes or any level ≥10 ppm in the 20-foot Zone, then the following actions will be taken:

1. Monitoring will be conducted continuously in the "20 foot zone" until VOC levels are below 5 ppm. All intrusive site activities will be halted during this time.
2. The site owner will be notified.
3. The NYSDEC will be notified.

Table 6-1. Vapor Monitoring Requirements

Total VOC Concentration (ppm)	Method	Monitoring Zone	Monitoring Requirements	Level of PPE
<5	PID	Work Zone	Periodically in the work zone at minimum 30-minute intervals	Level D
>5	PID	Work Zone	Continually in the work zone	Level C
>50	PID	Work Zone	Vacate area	Vacate area

6.2 Dust/Particles

When the 15-minute average dust level remains below 0.1 milligrams per cubic meter (mg/m3) above background, intrusive work activities may continue.

If the downwind PM-10 particulate level is 0.1 mg/m3 greater than background (upwind perimeter) for the 15- minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 0.15 mg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 0.15 mg/m3 of the upwind level and in preventing visible dust migration.

Particulate Emission Response Plan

If the particulate levels increase above 0.1 mg/m3 over background at the downwind perimeter of the exclusion zone but remain below 0.15 mg/m3 above background, work can resume provided dust suppression techniques are employed and no visible dust is migrating from the work area.

If the particulate levels increase above 0.15 mg/m3 over background at the downwind perimeter of the exclusion zone, work can resume provided dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration

6.3 Field Instrumentation and Sampling

Field health and safety air sampling for the RP field investigation will consist of organic vapor monitoring using a PID (Section 6.1.1) according to provisions of Section 2 and Table 2 1.

6.3.1 Photoionization Detector (PID)

The air will be monitored with a portable PID equipped with a 10.2 electron volt detector to determine the presence and concentration of organic vapors before sampling, during intrusive field activities (monitoring well installations and test pit excavations). PID monitoring is conducted in the work zone.

PID monitoring will be initiated before starting sampling and, if the action levels are exceeded, continuously in the breathing zone of the worker collecting the samples.

Personnel monitoring samples will be collected in the breathing zone and, if workers are wearing respiratory protective equipment, outside the face piece. The sampling strategies may change if work tasks or operations change. Monitoring instruments will be checked for appropriate response, in accordance with the manufacturer's instructions, before use each sampling day.

- Hazard Monitored: Many organic and some inorganic gases and vapors.
- Application: Detects the presence and total concentration of many organic and some inorganic gases and vapors.
- Detection Method: Ionizes molecules using UV radiation, produces a current that is proportional to the number of ions present.
- General Care and Maintenance: Recharge daily or replace the battery. Regularly clean the lamp window. Regularly clean and maintain the instrument and its accessories. Turn the function switch to "stand-by" and allow the instrument to "warm up" for 5 min.
- Typical Operating Time: 10 hours, or 5 hours with strip chart recorder.

Table 6-2. Community Air Monitoring Plan (CAMP) Action Levels			
Contaminant (Equipment/Method)	**Frequency**	**Downwind Action Levels***	**SSHC Action/Response**
Volatile Organic Vapors Odor Observations and PID (PID with 11.7 eV lamp)	1. Continuously downwind during invasive work activities. 2. When observations of any unusual odors are reported to the SSHC.	<5 ppm (at the exclusion zone perimeter)	1. Work may continue. 2. Readings shall be recorded and made available for NYSDEC/NYSDOH review.
		5 ppm (at the exclusion zone perimeter)	1. STOP work. 2. Move to a location 200' downwind or at half the distance between the exclusion zone and nearest dwelling (but not closer than 20') and continue air monitoring and recording readings at this location. If the VOC level at the downwind location is <5 ppm, return to the exclusion zone perimeter and take additional VOC readings. 3. Work may continue if exclusion zone perimeter readings are <5 pm and additional vapor controls have been implemented. 4. Monitoring must continue at the exclusion zone perimeter for as long as VOC levels are ≥5 ppm.
		25 ppm (at the exclusion zone perimeter)	1. STOP work. 2. Implement additional vapor emission controls to reduce VOC levels below 5 ppm (at the exclusion zone perimeter). 3. Notify the B&L Project Manager and SMC representative.
Dust Observations and Dust Meter (Dust Tr	1. Continuously downwind during invasive work activities. 2. When observations of any unusual odors are reported to the SSHC.	<0.1 mg/m^3 (at the exclusion zone perimeter)	1. Work may continue. 2. Readings shall be recorded and made available for NYSDEC/DYSDOH review.
		0.1-0.15 mg/m^3 (at the exclusion zone perimeter)	1. Work may continue, but use dust suppression controls.

		>0.15 mg/m^3 (at the exclusion zone perimeter)	1. STOP work. 2. Work may continue if exclusion zone dust readings are <0.15 mg/m^3 and additional dust controls have been implemented. 3. Immediately notify the B&L Project Manager, B&L Manager of Corporate Health and Safety, and SMC representative. 4. Work will not restart until the cause of the elevated dust levels has been evaluated and corrective action identified.

7.0 SITE OPERATING PROCEDURES

These following guidelines comply with the established guidelines of the Barton & Loguidice, D.P.C., Corporate Health and Safety Program.

All field investigation activities must be coordinated through the Site Manager.

During any activity conducted on-site in which a potential exists for exposure to hazardous materials, accident or injury, at least two persons must be present who are in constant communication with each other. At least two persons must also be present during all demolition or excavation activities.

Samples obtained from areas known or suspected to contain contaminated substances or materials must be handled with appropriate personal protection equipment.

All equipment used to conduct the Site Investigation must be properly decontaminated and maintained in good working order. Equipment must be inspected for signs of defects and/or contamination before and after each use.

The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated will result in the evacuation of the activity zone until a complete evaluation of the hazard can be performed.

7.1 Daily Operating Procedures

The following are the daily operating procedures that are to be followed by on-site personnel:

- Hold Tailgate Safety Meetings prior to work start and as needed thereafter (suggest daily; however, minimum of weekly).
- Use monitoring instruments and follow designated protocol and contaminant action levels.
- Use PPE as specified.
- Use hearing protection around heavy equipment.
- Remain upwind of operations and airborne contaminants, if possible.
- Establish a work/rest regimen when ambient temperatures and protective clothing create potential thermal hazards.
- Eating, drinking, applying cosmetics and smoking are prohibited in work areas.
- Refer to the SSHC for specific safety concerns for each individual site task.

- On-site personnel are encouraged to be alert to their own physical condition, as well as their co-workers.
- **All accidents, no matter how minor,** must be immediately reported to the SSHC.

7.2 Site Security

Site security will be monitored and controlled by the Project Manager, the Site Supervisor, and the SSHC. Their duties will include limiting access to the work area to authorized personnel, overseeing project equipment and materials, and overseeing work activities. The procedures specified below will be followed to control access to each work site to prevent persons who may be unaware of site conditions from exposure to hazards. Work area control procedures may be modified as required by site conditions.

7.3 Site Control

Work zones will be required during site activities identified in this HASP. The following two categories of work zones will be established at each sampling point: an exclusion zone and a buffer zone. The remainder of the site will be the support zone.

7.3.1 Exclusion/Activity Zone

The exclusion zone is where sampling activities are conducted. The SSHC will identify this zone. It must be at least 30 ft. in diameter and centered on the work activities.

7.3.2 Buffer/Decontamination Zone

The buffer zone contains personnel and equipment decontamination stations and staging areas for samples. The buffer zone will be located upwind of the work activities. It will only be large enough to contain equipment and personnel necessary to keep potentially contaminated media and materials in the immediate work area.

7.3.3 Support Zone

The remainder of the area is defined as the support zone. The support zone contains support facilities, extra equipment, transport vehicles, and additional personnel and equipment necessary to manage and perform work activities.

7.4 Buddy System

Most activities in a contaminated or otherwise hazardous area should be conducted with a partner who is able to:

- Provide his or her partner with assistance.
- Observe his or her partner for signs of chemical or heat exposure.
- Periodically check the integrity of his or her partner's protective clothing.
- Notify the SSHC if emergency help is needed.

7.5 Site Access Procedures

Access during field activities will be limited to those personnel required. Such personnel are anticipated to include, but will not necessarily be limited to, B&L employees or subcontractors and those representatives as designated by the NYSDEC or local agencies. Site access will be monitored by the SSHC, who will maintain a log-in sheet. The log will include B&L and other personnel on the site, their arrival and departure times and their destination on the site.

7.6 Confined Space Entry

No entry of permit required confined spaces is expected while B&L personnel perform the tasks listed in the FAP. A confined space is defined as a space that has limited or restricted means for entry (for example tanks, vessels, silos, storage bins, hoppers, vaults, and pits), is not designed for continuous employee occupancy, and large enough to enter.

8.0 DECONTAMINATION

8.1 Personnel Decontamination Procedures

The SSHC will be responsible for supervising the proper use and decontamination of PPE. The SSHC will also establish and monitor the decontamination line.

Decontamination involves scrubbing with a soap and water solution followed by rinses with potable water. Decontamination will take place on a decontamination pad. Dirt, oil, grease, or other foreign materials that are visible will be removed from surfaces. Scrubbing with a brush may be required to remove materials that adhere to the surfaces. Splash protection garments will be washed with soap and potable water before removal. Non- disposable garments will be air dried before storage. Waste waters from personnel decontamination will be disposed of with the waste waters from equipment decontamination. Respirators will be sanitized as well as decontaminated each day before re-use. The manufacturer's instructions will be followed to sanitize the respirator masks.

The following decontamination protocol, or one providing the same level of decontamination, will be followed:

Station 1. Equipment Drop: Provide an area covered with a plastic drop cloth. Deposit equipment used on-site including tools, sampling devices and containers, monitoring instruments, radios and clipboards on the plastic drop cloth. During hot weather a cool down station with chairs, fans, and replenishing beverages may be set up in this area.

Station 2. Outer Garment, Boots, and Gloves Wash and Rinse: Establish a wash station for gloves, boots, and the protective suit (when worn). Scrub outer boots, outer gloves, and protective suit with detergent and water. Rinse with potable water.

Station 3a. Outer Boot and Glove Removal: Provide seating for use during the removal and collection of outer boots. Remove outer boots. Deposit them in a container with a plastic liner. If the boots are to be reused after cleaning, place them in a secure location near the work site. Provide a location for removal, collection, and disposal of outer gloves. Remove the outer gloves. Deposit them in a container for disposal.

Station 3b. Filter or Cartridge Exchange: This station will be established only if respirators are worn. The worker's respirator cartridges and filters can be exchanged, new outer gloves and outer boots donned, and joints taped at this station. From here the worker can return to work duties in the exclusion zone.

Station 4. Outer Garment Removal: This station will only be provided if a protective outer garment is worn. Provide a bench to sit on during the removal of the protective garment. If the garment is disposable, deposit it in a container with a plastic liner; otherwise, hang it up to air dry.

Station 5. Respirator Removal: This station will be established only if respirators are worn. Remove the respirator. Avoid touching the face with gloved fingers. Deposit the respirator on a plastic sheet.

Station 6. Inner Glove Removal: Remove and dispose of inner gloves. Deposit them in a container with a plastic liner. If the gloves are to be reused, place them in a secure location near the work site, preferably in a plastic container.

Station 7. Field Wash: Provide a place for a field wash. Wash hands and face thoroughly. Shower if body contamination is suspected.

8.2 Emergency Decontamination Procedures

Although no contact with chemicals that present a hazard is anticipated for the field program, this section has been included in the event of an emergency. The extent of emergency decontamination depends on the severity of the injury or illness and the nature of the contamination. Minimum decontamination will consist of detergent washing, rinsing and removal of contaminated outer clothing and equipment. If time does not permit the completion of all of these actions, it is acceptable to remove the contaminated clothing without washing it. If the situation is such that the contaminated clothing cannot be removed, the person should be given required first aid treatment, and then wrapped in plastic or a blanket prior to transport to medical care. If heat stress is a factor in the victim's illness/injury, outer clothing will be removed from the victim immediately.

8.3 Monitoring Equipment Decontamination Procedures

Sampling equipment used for health monitoring purposes will be cleaned of visible contamination and debris before initial use on site, between uses, and after final use. Monitoring equipment that contacts contaminated media will be decontaminated after each use by a low phosphate detergent brushing followed by a clean water rinse. After decontamination, monitoring equipment will be stored separately from personal protective equipment. Decontaminated or clean equipment not in use will be covered with plastic and stored in a designated storage area in the support zone.

8.4 Decontamination Supplies

The following supplies will be available on site for the decontamination of personnel and equipment:

- Plastic drop cloths;
- Plastic bags or DOT-approved fiberboard drums to collect non-reusable protective clothing;
- Plastic wash tubs;
- Soft bristled long-handle brushes;
- DOT-approved drums or appropriate other containers, to collect wash and rinse water;
- Hand spray units for decontamination;
- Soap, water, alcohol wipes, and towels to wash hands, faces, and respirators; and,
- Washable tables and benches or chairs.

8.5 Collection and Disposition of Contaminated Materials

Cuttings and field decontamination wastes are to be collected, drummed, and disposed of in accordance with the procedures in the FAP. Investigation derived waste will be managed as described in the FAP.

8.6 Refuse Disposal

Site refuse will be contained in appropriate areas or facilities. Trash from the project will be properly disposed.

9.0 EMERGENCY RESPONSE

9.1 Notification of Site Emergencies

In an emergency, site personnel will signal distress either by yelling or with three blasts from a horn (vehicle horn, air horn and so forth). The SSHC, Site Supervisor, or the Project Manager will immediately be notified of the nature and extent of the emergency.

Directions to the Claxton-Hepburn Medical Center Emergency Room from the site are provided below:

- Exit the Collins Property
- Turn left and head northeast on NY-68 E toward Ogden Street – 0.4 mi
- Turn right onto Jefferson Ave/King St – 52.0 ft
- Turn left onto King St – 0.3 mi
    - Destination will be on the right

A map of the route to the Claxton-Hepburn Medical Center Emergency Room from the Site is provided as Figure 1.

Should someone be transported to a hospital or doctor, a copy of this HASP should accompany them.

The following table contains emergency telephone numbers. This table will be kept with the portable telephone and updated as needed by the SSHC. The portable telephone will be used to notify off-site personnel of emergencies. The operating condition of this telephone will be determined daily before initiation of activities.

Table 9-1. Emergency Contact Numbers		
Contact	**Person or Agency**	**Phone Number**
Town Representative	Bill Dashnaw	(315) 854-0146
NYSDEC Representative	Kelly Hale	(315) 785-2381
Law Enforcement	City of Ogdensburg PD	911 (315) 848-3341 {non-emergency}
Fire Department	City of Ogdensburg FD	911 (315) 393-2321 {non-emergency}
Confined Space Rescue (Fire Department)	City of Ogdensburg FD	911 (315) 393-2321 {non-emergency}
Ambulance	City of Ogdensburg FD	911 (315) 393-2321 {non-emergency}
Poison Control Center	n/a	1-800-222-1222
Hospital – Emergency	Claxton-Hepburn Medical Center	(315) 393-3600
B&L Site Manager/Site Safety Officer	Stephen Le Fevre, P.G.	(518) 218-1801 (518) 369-9290 {cell}
B&L Officer-in-Charge	Scott D. Nostrand, P.E.	(315) 457-5200

9.2 Responsibilities

The SSHC is responsible for responding to, or coordinating the response of off-site personnel to, emergencies. In the event of an emergency, the SSHC will direct notification and response, and will assist the Site Supervisor in arranging follow-up actions. Upon notification of an exposure incident, the SSHC will call the hospital, fire, and police emergency response personnel for recommended medical diagnosis, treatment if necessary, and transportation to the hospital.

Before the start of investigation activities, the SSHC will:

- Confirm that the following safety equipment is available: eyewash station, first aid supplies, and a fire extinguisher.
- Have a working knowledge of the B&L safety equipment.
- Confirm the most direct route to Clifton-Fine Hospital is prominently posted with the emergency telephone numbers.
- Confirm that employees who will respond to emergencies have been appropriately trained.

Before work may resume following an emergency, used emergency equipment must be recharged, refilled, or replaced and government agencies must be notified as required.

The Project Manager, assisted by the SSHC and the Site Supervisor, must investigate the incident as soon as possible. The Project Manager will determine whether and to what extent exposure actually occurred, the cause of exposure, and the means to prevent similar incidents. The resulting report must be signed and dated by the Project Manager, the SSHC, and the Site Supervisor.

9.3 Accidents and Injuries

In the event of an accident or injury, workers will immediately implement emergency isolation measures to assist those who have been injured or exposed and to protect others from hazards. Upon notification of an exposure incident, the SSHC will contact emergency response personnel who can provide medical diagnosis and treatment. If necessary, immediate medical care will be provided by personnel trained in first aid procedures. Other on-site medical or first aid response to an injury or illness will be provided only by personnel competent in such matters. In addition, the B&L Corporate Associate for Safety and Health will be notified within 24-hours of an accident involving B&L personnel and/or its subcontractors.

9.4 Safe Refuge

Before commencing site activities the SSHC will identify the location that will serve as the place of refuge for B&L workers in case of an emergency evacuation. During an emergency evacuation, personnel in the exclusion zone should evacuate the work area both for their own safety and to prevent hampering rescue efforts. Following an evacuation, the SSHC will account for site personnel.

9.5 Fire Fighting Procedures

A fire extinguisher meeting the requirements of 29 CFR Part 1910 Subpart L, as a minimum, will be available in the support zone during on-site activities. This is intended to control small fires. When a fire cannot be controlled with the extinguisher, the exclusion zone will be evacuated, and the fire department will be contacted immediately. The SSHC or the Site Supervisor will determine when to contact the fire department.

9.6 Emergency Equipment

The following equipment, selected based on potential site hazards, will be maintained in the support zone for safety and emergency response purposes:

- Fire extinguisher;
- First aid kit; and
- Eye wash bottles.

9.7 Emergency Site Communications

There will be a cellular telephone located in either the Site Manager's and/or SSHC's vehicle for emergency use. Emergency telephone numbers are listed in Attachment 7 of this HASP. There will be air horns, walkie-talkies, and/or other audible emergency signals located within the exclusion zone and decontamination area to signal others of an emergency. The SSHC should brief all personnel regarding audible emergency signals to be used during the site activities prior to starting the work. Site personnel will use the following hand signals to inform others of emergencies:

- Hand gripping throat – out of air, cannot breathe.
- Grip partner's wrist or both hands around waist – leave area immediately.
- Hands on top of head – need assistance.
- Thumbs up – everything's OK, or I understand.
- Thumbs down – No.

9.8 Security and Control

Work zone security and control during emergencies, accidents, and incidents will be monitored by the SSHC or the Site Supervisor. The duties of the SSHC or the Site Supervisor include limiting access to the work zones to authorized personnel and overseeing emergency response activities.

10.0 SPECIAL PRECAUTIONS AND PROCEDURES

The activities listed in the Work Plan may expose personnel to both chemical and physical hazards. The hazards associated with specific site activities are discussed in Section 2. The potential for exposure to hazardous situations will be significantly reduced through the use of air monitoring, PPE, hazard awareness training, and administrative and engineering controls. Other general hazards that may be present on a hazardous waste work site are discussed below.

10.1 Heat Stress

The timing and location of this project may be such that heat stress could pose a threat to the health and safety of site personnel. The SSHC will implement work and rest regimens so that B&L personnel do not suffer adverse effects from heat. These regimens will be developed by the SSHC following the guidelines in the 1997 edition of the ACGIH Threshold Limit Values for Physical Agents in the Work Environment. Special clothing and an appropriate diet and fluid intake will be recommended to B&L personnel involved in the activities specified in Section 2 to further reduce this hazard. In addition, ice and fluids will be provided as appropriate in the support zone.

10.2 Cold Injury

The project requires work over water and thus the timing and location of this project may be such that cold injury could pose a threat to the health and safety of site personnel. Factors that influence the development of a cold related injury include ambient temperatures, wind velocity and wet clothing and skin. The SSHC will implement work and rest regimens so that B&L personnel do not suffer adverse effects from cold. These regimens will be developed by the SSHC following the guidelines in the 1997 edition of the ACGIH Threshold Limit Values for Physical Agents in the Work Environment. Special clothing and an appropriate diet and fluid intake will be recommended to B&L personnel involved in the activities specified in Section 2 to further reduce this hazard. In addition, ice and fluids will be provided as appropriate in the support zone.

10.3 Heavy Equipment/Machinery

B&L employees performing site activities may use or work near operating heavy equipment and machinery. Respiratory protection and protective eyewear may be worn during portions of work activities. Since this protective equipment reduces peripheral vision of the wearer, B&L personnel should exercise extreme caution in the

vicinity of operating equipment and machinery to avoid physical injury to themselves or others.

10.4 Additional Safety Practices

The following are important safety precautions that will be enforced during the completion of the activities listed in Section 2:

- Contact with potentially contaminated surfaces should be avoided whenever possible. Workers should minimize walking through puddles, mud, or other discolored surfaces; kneeling on ground; and leaning, sitting, or placing equipment on drums, containers, vehicles, or the ground.
- Medicine and alcohol can mask the effects of exposure to certain compounds. Consumption of prescribed drugs must be at the direction of a physician.
- B&L personnel and equipment in the work areas will be minimized consistent with effective site operations.
- Unsafe or inoperable equipment left unattended will be identified by a "DANGER, DO NOT OPERATE" tag.
- Activities in the exclusion zone will be conducted using the "Buddy System." The Buddy is another worker fully dressed in the appropriate personal protective equipment who can perform the following activities:
- Provide partner with assistance
- Observe partner for sign of chemical or heat exposure
- Periodically check the integrity of partner's PPE
- Notify others if emergency help is needed.
- The HASP will be reviewed frequently for its applicability to the current and upcoming operations and activities.

10.5 Daily Log Contents

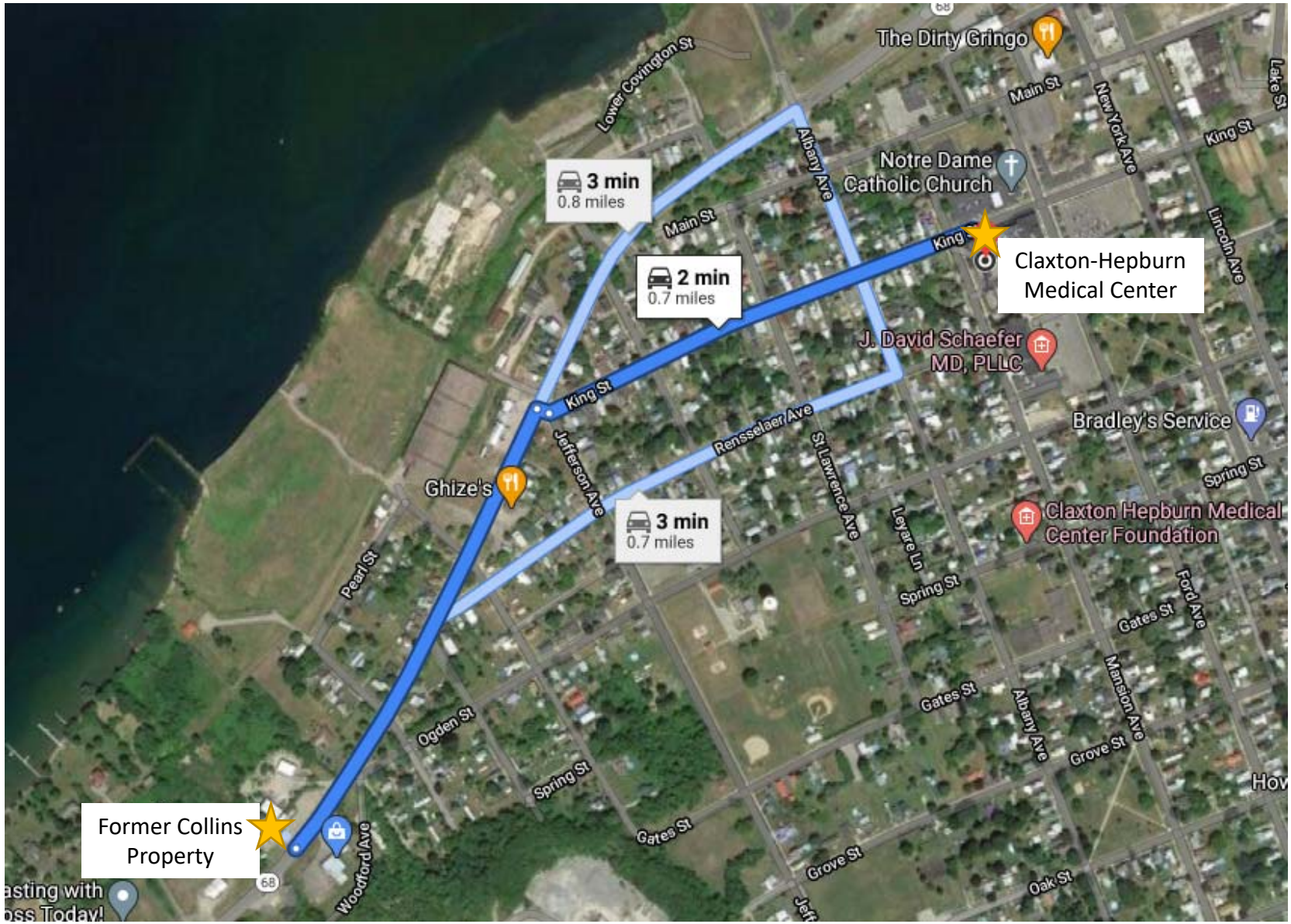
The Project Manager and the SSHC will establish a system appropriate to the SMC Brownfield Site investigation areas that will record, at a minimum, the following information:

- The B&L Engineers personnel and other personnel conducting the site activities, their arrival and departure times, and their destination at the investigation areas

- Incidents and unusual activities that occur on the site such as, but not limited to, accidents, breaches of security, injuries, equipment failures and weather related problems
- Changes to the Work Plan and the HASP
- Daily Information such as:
  - Work accomplished and the current site status
  - Air monitoring results

Figure 1

Route to Claxton-Hepburn Medical Center from Former Collins Property


Former Collins Property
Claxton-Hepburn Medical Center
3 min
0.8 miles
2 min
0.7 miles
3 min
0.7 miles
The Dirty Gringo
Notre Dame Catholic Church
J. David Schaefer MD, PLLC
Bradley's Service
Claxton Hepburn Medical Center Foundation
Ghize's
Lower Covington St
Main St
King St
Albany Ave
New York Ave
Lincoln Ave
Lake St
Rensselaer Ave
Jefferson Ave
St Lawrence Ave
Leyare Ln
Spring St
Pearl St
Ogden St
Gates St
Ford Ave
Mansion Ave
Grove St
Oak St
Woodford Ave
68

Attachment 1

Appendix 1A
of
New York State Department of Health
Generic Community Air Monitoring Plan

and

Appendix 1B
of
Fugitive Dust and Particulate Monitoring

Attachment 2

Community Air Monitoring Form

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

IN-HOUSE COORDINATION	
INITIALS	DATE

Community Air Monitoring Form

PROJECT NAME:		REPORT NO:	
OWNER:		PROJECT NO:	
CONTRACTOR:		DATE:	
		DAY OF THE WEEK	
		S M T W TH F SA	

WORK FORCE:						WEATHER CONDITION	
						AM	PM
Superintendent ( )		Superintendent ( )					
Foreman ( )		Foreman ( )				TEMPERATURE	
Operators		Operators				AM	PM
Laborer		Laborer				F	F
Surveyors						WIND SPEED/DIRECTION	
Teamsters						AM	PM
Mechanic						MPH	MPH

EQUIPMENT USED:							
Bulldozer		Dump Truck		Dust Trak			
Excavator		Water Truck		Mini-RAE			
Loader		Smooth Drum Roller		Screen			
End Dump		Padfoot Roller		Skidsteer			

MAINTENANCE & PROTECTION OF TRAFFIC:

DESCRIPTION OF WORK ACCOMPLISHED:

DESCRIPTION OF WORK ACCOMPLISHED (CONTINUED):

DISCUSSIONS:

VISITORS:			

SKETCHES:

INSPECTOR: _____ **DATE:** _____

Appendix B

Quality Assurance Project Plan

Appendix B Quality Assurance Project Plan

Former Collins Property Environmental Restoration Project

St. Lawrence County, NY

Prepared For

Town of Oswegatchie

51 State Street
Heuvelton, New York 13654

April 2021

Barton&Loguidice

Former Collins Property
Environmental Restoration Project
St. Lawrence County, New York

Appendix B

Quality Assurance Project Plan

April 2021

Prepared For:

Town of Oswegatchie
51 State Street
P.O. Box 134
Heuvelton, New York 13654

and

New York State Department of Environmental Conservation
Region 6
317 Washington Street
Watertown, New York 13601-3787

Prepared By:

Barton & Loguidice, D.P.C.
10 Airline Drive, Suite 200
Albany, New York 12205

Table of Contents

Section Page

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) details specific Quality Assurance and Quality Control (QA/QC) requirements that apply to the Remedial Program (RP) activities at the Former Collins Property Site (the Site) in Oswegatchie, New York. The QA/QC requirements are designed to assist in achieving the project data quality objectives (DQOs) and analytical DQOs for sampling activities and groundwater monitoring that will be performed at the site associated with the remedial action.

The Former Collins Property (the Site) is located at 7610 State Highway 68 (also known as 520 Riverside Drive) in the Town of Oswegatchie, St. Lawrence County, New York. The subject site is currently owned by the Town of Oswegatchie. The 5.4-acre parcel is situated on the northwest side of Highway 68 and southeast of the St. Lawrence River. The site is bisected by a right-of-way for the Former New York Central Railroad. Land use in the area is mixed, including residential and commercial properties.

The site is currently vacant and contained mixed vegetation, including grasses interspersed with small shrubs. Historically, the site was 6.4 acres, but a 1-acre portion of the site was sold to Brendan M. Haggery in March 2005. The northeastern property line borders a parcel owned by the City of Ogdensburg and a residential property, while Collins-Hammond Electrical Contractors is adjacent to the southeast. The western property line is bounded by woods and a residential lot, and the southwestern property boundary borders a vacant lot. The topography of the site slopes gradually to the northwest toward the St. Lawrence River.

Remedial Alternatives (RAs) were developed and evaluated against the remedy selection criteria presented in 6 NYCRR Part 375-1.8(f) and presented in the Site Investigation/Remedial Alternatives Report prepared by B&L dated July 2012. As defined in the SIRAR, the selected remedial alternative consists of the excavation and on-site bioremediation of petroleum-contaminated soil via the Allu™ process. Contaminated soil that exceeds the restricted-residential soil cleanup objectives on Table 375-6.8(b) of 6 NYCC Part 375 will be excavated and remediated via the Allu™ process. Excavation will require some dewatering. Sampling will be required to confirm meeting the restricted-residential criteria, to characterize soil for offsite disposal, and to characterize water for offsite disposal.

2.0 PROJECT MANAGEMENT

2.1 Purpose

The QAPP is intended to provide field and laboratory personnel with guidance for the field activities as well as sample handling activities within the laboratory for each sampling event. The QAPP contains general and specific guidance on sample collection methodology, sample handling, sample containers, and laboratory procedures. Project personnel will follow the guidelines during each sampling event.

2.2 Scope and Objectives

This QAPP is intended to provide guidance for the remedial contractor, Barton & Loguidice, D.P.C. (B&L), and analytical laboratories performing remedial actions, and other applicable activities at the site. This QAPP is not intended to replace the laboratory's QAPP. It is, however, intended to provide guidance for related field QC collection, method selection, DQOs, and program specific validation guidelines.

2.3 Project Management Responsibilities

This section provides a description of the organizational structure of personnel involved with this project. This description defines the lines of authority and identifies key personnel assigned to various activities. The project manager will be the key operational manager for project execution, and will have the primary responsibility for project plan development and implementation of the project tasks. The Consultant and contracted laboratories responsible for performing and/or coordinating the tasks associated with this QAPP are clearly defined in the following sections.

Lines of communication, management activities, and technical direction within this project team will follow this organization arrangement. Below identifies key team members and their respective responsibilities.

Company/ Organization	Title	Name	Phone Number	Email
Regulatory Agency-NYSDEC	Project Manager	Kelly Hale	315-785-2381	Kelly.hale@dec.ny.gov
Town of Oswegatchie	n/a	Bill Dashnaw	315-854-0146	wdashnaw@slic.com
Barton & Loguidice, D.P.C.	Project Manager	Steve Le Fevre, PG	518-218-1801	slefevre@bartonandloguidice.com
	Project Engineer	Scott Nostrand, PE	716-436-7857	snostrand@bartonandloguidice.com
	Quality Assurance (QA) Officer	Bryce Dingman, PG	518-218-1801	bdingmang@bartonandloguidice.com

The staff performing the site activities will be directed by representatives of the project team. The personnel responsible for each of the site activities are to be determined.

The Analytical Laboratory Project Manager(s) will act as the primary liaison to the Consultant during implementation of project activities and will be responsible for the review of the final analytical reports submitted for this project. The Analytical Laboratory Project Manager(s) will also be responsible for coordination with the laboratory QA officer to implement the DQOs established in this program QAPP and alerting the Consultant to DQO and method updates prior to analysis and data submittal. The Analytical Laboratory Project Manager is responsible for the oversight and deliverables submitted by laboratories subcontracted by the originating laboratory.

Laboratory: [WILL NEED A LAB FIRST]

Project Manager:

Title:

Address:

Telephone Number:

2.4 Project Goals

Data collection during the site management program for the Former Collins Property will be compared to the regulatory standards criteria and guidance values that apply for documentation, confirmatory and monitoring samples collected pursuant to the Remedial Action Work Plan (RAWP).

The soil analyses will be used to determine whether soils remaining after excavation and Allu™ processing meet the restricted-residential soil cleanup objectives defined in Table 375-6.8(b) of 6 NYCRR Part 375. Water analysis results will be used to determine the compliance with the requirements of the facility receiving water from site dewatering. The facility and its requirements are still to be determined.

2.5 Project Documentation

The following list describes the documentation required for sites that are undergoing remedial activities or periodic groundwater and vapor sampling:

- Copies of all appropriate permits to complete the scope of work.
- Field notebook.
- Field sampling records, soil and water sampling, where appropriate, including the sample name, sample location, and purpose of sample.
- Sample chain-of-custody (COC) records.

- Sample COC records with the sample temperature at time of receipt at laboratory (for samples that are submitted to laboratory) noted.
- Final analytical data packages from the analyzing laboratory, completed as required in the Operation and Maintenance (O&M) Plan for the requested data deliverable level.
- Data validation report, if applicable.

The documentation listed above will be presented, if appropriate, in the remedial action report following completion of the remedial activities or in periodic groundwater monitoring reports. The Consultant will keep the documents on file for the duration of the project.

3.0 FIELD MEASUREMENT AND DATA ACQUISITION

3.1 Data Categories

The general categories of data that may be collected will include field screening data, and confirmational data, and system monitoring data for water samples. Site characterization samples may also be collected to determine the presence of site-related parameters in soil, sediment, soil gas, surface water and groundwater. The analytical methods to be used for soil, water and vapor analyses are summarized below.

3.1.1 Laboratory Analysis

The site data will be obtained by submitting soil, and water samples during the site management program to the laboratory to perform sample analysis. The fixed-based analytical laboratory will generate quantitative analytical data for soil, sediment, non-aqueous phase liquid, water and vapor using the methods listed in the Field Sampling Plan and SMP.

- Soil will be analyzed for TAL metals (EPA methods 6010D, 6020B, 7471B) ; TCL volatiles and semi-volatiles (EPA methods 8260C and 8270D), TCL pesticides (EPA method 8081B) and PCBs (EPA method 8151B)
- Soil may be characterized for disposal by analysis for toxicity characteristic leaching procedure (TCLP) parameters, with leaching performed by EPA Method 1131 and analysis of the leach by EPA Methods 8260, 8270, 8081, 8151, 6010, 6020, 7000, and 7470.
- Groundwater and treatment system effluent samples will be analyzed for volatile organic compounds (VOCs) by EPA Method 8260, metals by EPA methods 6010C and 7470, and other compounds that may be required by the discharge permit which has not yet been issued.

3.2 Sampling Procedures

The samples will be collected for each project as described in the RAWP and the Construction Work Plan (CWP).

4.0 FIELD QUALITY CONTROL

The following Quality Control samples will be collected as part of the project as described in this section.

Equipment/Rinsate Blanks – An equipment or rinsate blank is used to indicate potential contamination from sample instruments used to collect and transfer samples, and also serves as a measure of potential contamination from ambient sources during sample collection. When collecting solid or water samples, the equipment blank is a sample of laboratory demonstrated analyte-free water passed over and/or through cleaned sampling equipment. The water must originate from one common source within the laboratory and must be the same water used by the laboratory when performing the analyses (i.e., for method blanks). Equipment blanks will be collected, transported, and analyzed in the same manner as the samples acquired that day. Equipment blanks will be collected for all sampling except for when using dedicated and/or disposable sampling equipment.

Trip Blanks - Trip blanks are only required when collecting aqueous samples for volatile organics or dissolved gas analyses. They are not required for non-aqueous matrices or for analysis of any other parameters. They consist of a set of sample bottles filled at the laboratory with laboratory demonstrated analyte-free water. Trip blanks accompany the empty sample containers that are shipped from the laboratory into the field, and then back to the laboratory along with the collected samples for analysis. Trip blank are required at the rate of one per each cooler containing aqueous volatile organic or dissolved gas samples. These bottles are never opened in the field. Trip blanks must return to the laboratory with the same set of containers they accompanied to the field.

Field Duplicates – A field duplicate (FD) sample pair consists of two independent samples that are collected at approximately the same time and place, using the same collection methods. Both are containerized, handled, and analyzed in an identical manner. Field duplicates are useful in documenting the precision of the sampling process, and also provide a measure of analysis precision. Duplicate samples will be collected at a required frequency of 1 per 20 samples, unless otherwise specified in the site-specific QAPP addendum. Field duplicates are typically labeled so that the laboratory cannot determine or identify the location from which the field duplicate was collected.

5.0 ANALYTICAL DATA QUALITY ASSESSMENT

This section of the QAPP presents the established criteria for assuring data quality and consistency for laboratory QA/QC, laboratory reporting, and data validation. This is of particular importance when utilizing more than one analytical laboratory. The analytical DQOs discussed in the following sections will provide guidance for the Consultant Project Manager, the Consultant Quality Assurance Officer, and the Analytical Laboratory. In general, data validation will be performed for soil characterization and will not be required for confirmation or routine samples collected during operation, maintenance and monitoring activities.

5.1 Analytical Data Quality Objectives

Analytical DQOs are used as a guide for data quality assessment. The DQOs are precision, accuracy, representativeness, completeness, and comparability (The PARCC Parameters). These qualitative and quantitative objectives ensure the data generated during the site characterization activities, and if warranted remedial actions, are scientifically valid, defensible, and meet the needs of each project. The DQOs are dependent on the intended data usage and are based on the premise that the ultimate use of a particular data set should dictate the quantity and quality of these data.

Precision is a measure of the reproducibility of concentrations reported for duplicate analyses, calculated by determining the relative percent difference (RPD) between the two values. Precision will be reviewed for the following analysis: LCS/LCSD, MS/MSD, and field duplicate (groundwater samples collected from the same location).

Accuracy is the degree to which the measurement data approaches the "true" value for each analyte. For soil samples, accuracy is assessed by calculating the percent recovery for a sample spiked with the analyte of concern (LCS, surrogates, matrix spike).

Representativeness refers to the comparability of the sample collection procedures to those delineated in the sampling and analysis plan and to the degree which the analytical data represents the subsurface contaminant concentrations. Representativeness will be accomplished by adhering to consistent field sampling and analytical procedures for samples.

Completeness is defined as the ratio of usable laboratory measurements to the total number of planned measurements for this investigation.

Comparability is an evaluation of the relative consistency of the laboratory measurement data. Since comparability cannot be measured quantitatively, professional judgment is relied upon. Internal comparability will be achieved for groundwater by adhering to consistent sample collection procedures and analyses methods for any site characterization activities.

5.2 Sample Custody and Holding Times

Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for presenting sample analytical results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The procedures used in these investigations will follow the chain-of-custody guidelines of *NEIC Policies and Procedures*, prepared by the National Enforcement Investigations Center (NEIC) of the USEPA Office of Enforcement.

5.2.1 Custody Definitions

- Chain-of-Custody Officer - The employee responsible for oversight of all associated chain-of-custody activities is the Onsite Geologist (or his/her designee).
- Under Custody - A sample is "Under Custody" if:
  - It is in one's possession, or
  - It is in one's view, after being in one's possession, or
  - It was in one's possession and one locked it up, or
  - It is in a designated secure area.

5.2.2 Responsibilities

The onsite Environmental Scientist will be responsible for monitoring all chain-of-custody activities and for collecting legally admissible chain-of-custody documentation for the permanent project file. The onsite Environmental Scientist will be responsible for:

- Initially reviewing sample labels or tags, closure tapes, and chain-of-custody record forms. The onsite Environmental Scientist shall document this review for the project file.
- Training all field sampling personnel in the methodologies for carrying out chain-of-custody and the proper use of all chain-of-custody forms and record documents.
- Monitoring the implementation of chain-of-custody procedures.
- Submit copies of the completed chain-of-custody forms to the Project Manager daily.

5.2.3 Chain-of-Custody

Chain-of-custody is initiated in the laboratory when the sample containers are cleaned, packed, and shipped to the site for use in the field. When the containers are received from the laboratory, they will be checked for any breach of custody including, but not limited to incomplete chain-of-custody records, broken chain-of-custody seals, or any evidence of tampering. Upon receipt of the samples, the laboratory will check for breach of custody as previously described.

5.2.4 Sample Containers and Holding Times

The following tables identify the analytical method, container, preservation, and holding time requirements. All holding times begin with the date/time of sample collection.

Soil Characterization Samples				
Analyses	**Methods**	**Container**	**Preservative**	**Holding Time**
TCL Volatiles	8260C	VOA vials with Teflon-lined septum caps	4° C	2 Days (Extraction)
TCL Semivolatiles	8270D	8 oz Amber Glass, Teflon Lined	4° C	7 Days (Extraction)
TAL Metals	6010D, 6020B, 7471B	8 oz Amber Glass, Teflon Lined	4° C	7 Days (Extraction)
TCL Pesticides	8081B	8 oz Amber Glass, Teflon Lined	4° C	14 Days (Extraction)
PCBs	8151B	4 oz Large Amber Teflon Lined	4° C	14 Days (Extraction)

Soil TCLP Analyses				
Analyses	**Methods**	**Container**	**Preservative**	**Holding Time**
Mercury	1311, 1312, 7470A	4 oz Amber Glass	4° C	28 Days (Extraction)
Metals	1311, 1312, 6010D, 6020B, 7000A	4 oz Amber Glass	4° C	180 Days (Extraction)
Pesticides/Herbicides	1311, 1312, 8081B, 8151A	8 oz Amber Glass, Teflon Lined	4° C	14 Days (Extraction)
Semivolatiles	1311, 1312, 8270D	8 oz Amber Glass, Teflon Lined	4° C	14 Days (Extraction)
Volatiles	1311, 1312, 8260C	4 oz Large Amber Glass VOA Vial, Teflon Lined	4° C	14 Days (Extraction)

Water Analyses				
Analyses	**Methods**	**Container**	**Preservative**	**Holding Time**
Volatiles	8260	two 40-ml., glass vials with a teflon-lined septum cap	4° C, hydrochloric acid to pH below 2	14 Days
Metals	6010C, 7470	500 ml plastic	HNO3 to pH <2 Cool, 4°C	180 Days (28 days for Hg)

5.3 Calibration Procedures and Frequency

In order to obtain a high level of precision and accuracy during sample processing procedures, laboratory instruments must be calibrated properly. Several analytical support areas must be considered so the integrity of standards and reagents is upheld prior to instrument calibration. The following sections describe the analytical support areas and laboratory instrument calibration procedures.

5.3.1 Analytical Support Areas

Prior to generating quality data, several analytical support areas must be considered:

Standard/Reagent Preparation - Primary reference standards and secondary standard solutions shall be obtained from National Institute of Standards and Technology (NIST), or other reliable commercial sources to verify the highest purity possible. The preparation and maintenance of standards and reagents will be accomplished per the referenced methods. All standards and standard solutions are to be formally documented (i.e., in a bound logbook) and should identify the supplier, lot number, purity/concentration, receipt/preparation date, preparer's name, method of preparation, expiration date, and any other pertinent information. All standard solutions shall be validated prior to use. Care shall be exercised in the proper storage and handling of standard solutions (e.g., separating volatile standards from nonvolatile standards). The laboratory shall continually monitor the quality of the standards and reagents through well documented procedures.

Balances - The analytical balances shall be calibrated and maintained in accordance with American Society of Testing Materials (ASTM) specifications. Calibration is conducted with two Class-1 weights that bracket the expected balance use range. The laboratory shall check the accuracy of the balances daily and properly document results in permanently bound logbooks.

Refrigerators/Freezers - The temperature of the refrigerators and freezers within the laboratory shall be monitored and recorded daily. This will verify that the quality of the standards and reagents is not compromised and the integrity of the analytical samples is upheld. Appropriate acceptance ranges (4ºC ± 2ºC for refrigerators) shall be clearly posted on each unit in service.

Water Supply System - The laboratory must maintain a sufficient water supply for all project needs. The grade of the water must be of the highest quality (analyte-free) in order to eliminate false-positives from the analytical results. Ultraviolet cartridges or carbon absorption treatments are recommended for organic analyses. Appropriate documentation of the quality of the water supply system(s) will be performed on a regular basis.

Air Supply System - The laboratory must maintain a sufficient clean (analyte free) air supply for all project needs if required. The grade of the air must be of the highest quality (analyte-free) in order to eliminate false-positives from the analytical results. Appropriate documentation of the quality of the air supply system(s) will be performed on a regular basis by the laboratory.

5.3.2 Laboratory Instruments

Calibration of instruments is required to verify that the analytical system is operating properly and at the sensitivity necessary to meet method established quantitation limits. Each instrument for organic analysis shall be calibrated with standards appropriate to the type of instrument and linear range established within the analytical method(s).

Calibration of an instrument must be performed prior to the analysis of any samples (initial calibration) and then at periodic intervals (continuing calibration) during the sample analysis to verify that the instrument is still properly calibrated. If the contract laboratory cannot meet the method-required calibration requirements, corrective action shall be taken as discussed in Section 11.0. All corrective action procedures taken by the contract laboratory are to be documented, summarized within the case narrative, and submitted with the analytical results.

QA/QC procedures, if applicable, will be implemented using methods that ensure each project's data needs for completeness, comparability, representativeness, accuracy, and precision are met. Based on these QA/QC objectives, the water sample analyses will be completed in accordance with USEPA or USEPA approved methodologies.

5.4 Laboratory Quality Assurance/Quality Control Procedures

QA/QC procedures, if applicable, will be implemented using methods that ensure each project's data needs for completeness, comparability, representativeness, accuracy, and precision are met. Based on these QA/QC objectives, the water sample analyses will be completed in accordance with USEPA or USEPA approved methodologies.

The laboratory will utilize QC samples to assess the validity of the analytical results of field samples. The laboratory QC samples will include: method blank analysis, laboratory control spike (LCS), surrogate spike analysis, MS/MSD analysis (duplicate analysis), and check standard analysis:

- A method blank is an analyte-free matrix similar to the field samples (solid or liquid), in which all of the reagents are added in the same proportion or concentration as used to process the field samples. Method blank analysis is performed to assess possible laboratory contamination each day of analysis, for each method of analysis and at a frequency of at least one per 20 samples analyzed. In the event compounds of interest are detected in the trip blank the raw data from the method blanks will be submitted

with the analytical data package to determine the source of contamination. In the event that concentrations of constituents of concern are found to be greater than the PQL in the method blank, corrective action will be performed to identify and eliminate the source of contamination prior to proceeding with the analyses. The analytical data will not be corrected based on the presence of an analyte in the method blank, and corrective action is not necessary in the event that the analyte is detected in the method blank but not in the sample. If an analyte continues to be found in the method blank and in the sample, and corrective actions are not implemented, the affected result will be flagged with the appropriate validation qualifier.

- The LCS or blank spikes are analyte-free samples of water, which are spiked with a known concentration of specific analytes. The spiking standard must be from a source independent of that used for calibration standards. The LCS is used to evaluate each preparation sample and to assess the statistical control of the method at a frequency of at least one per 20 samples. Corrective action will be implemented in the event that the LCS is found to be outside of the recovery acceptance limit.

- Surrogate spike analysis is used to evaluate the efficiency of the analytical procedure in recovering the true amount of a known compound. The surrogates are organic compounds similar to the target analyte(s) in chemical composition and behavior in the analytical process, but do not normally occur in environmental samples. Surrogate spikes are added to all samples, including QC samples. Percent recovery values are provided along with the sample results. Corrective action will be implemented in the event that the surrogate recovery is found to be outside acceptable limits, and the sample will be prepared and analyzed again. If the surrogate continues to be found outside the acceptable QC limits, the affected result will be flagged with the appropriate validation qualifier.

- MS/MSD samples are used to evaluate the effect of the sample matrix on the analytical method. The spiking standard must be from a source independent of that used for calibration standards. MS/MSD samples are analyzed at a frequency of one pair per sample batch or at least one pair per 20 samples. Samples designated as (FB), and (TB) must not be used for MS/MSD analyses. The MS/MSD is intended to evaluate the matrix effect on the instrument, not to control the analytical process. If the MS or MSD is found to be outside the acceptable QC limits, the affected result will be flagged with the appropriate qualifier.

5.5 Quality Assurance/Quality Control Data Package

Data package documentation will be implemented as prescribed by the laboratory contract and the site specific needs. B&L Level II data deliverables are detailed below. All data packages will be reviewed for package completeness.

Level II Data Deliverables

- Cover page
- Report narrative
- Method Summary
- Sample Summary
- Chain of Custody
- Data Qualifier Definitions
- Dilution Log
- Sample Results
- Lab QC Results
- Surrogate Recoveries
- Spike Recoveries

5.6 Calculation of Data Quality Indicators

Precision

Precision is evaluated using results from field duplicate and/or MS/MSD analyses. The RPD between the parent sample/field duplicate or between the MS/MSD concentrations is used to evaluate precision and calculated by the following formula:

$$RPD = \left[\frac{|X_1 - X_2|}{(X_1 + X_2)/2} \right] x100\%$$

where:

X_1 = *Measured value of sample or matrix spike*
X_2 = *Measured value of duplicate or matrix spike duplicate*

RPD criteria for this project shall meet method-specific QC requirements.

Accuracy

Accuracy is defined as the degree of difference between the measured or calculated value and the true value. Analytical accuracy is expressed as the %R of a compound that has been added to the environmental sample or laboratory demonstrated analyte free matrix at known concentrations before analysis. Accuracy will be determined from MS, MSD, MSB (or LCS) samples as well as from surrogate compounds and is calculated as follows:

$$\%R = \frac{(X_s - X_u)}{K} x\,100\%$$

where:

X_s = *Measured value of the spike sample*

X_u = *Measured value of the unspiked sample*

K = *Known amount of spike in the sample*

%R criteria for this project shall meet method-specific QC requirements.

Completeness

Completeness is calculated on a per matrix basis for the project and is calculated as follows:

$$\%\ Completeness = \frac{(N - X_n)}{N}\ x\ 100\%$$

where:

X_n = *Number of invalid measurements*

N = *Number of valid measurements expected to be obtained*

5.7 Corrective Actions

Laboratory corrective actions shall be implemented to resolve problems and restore proper functioning to the analytical system when errors, deficiencies, or out-of-control situations exist at the laboratory. Full documentation of the corrective action procedure needed to resolve the problem shall be filed in the project records, and the information summarized in the analytical report case narrative. A discussion of the corrective actions to be taken is presented in the following sections.

Incoming Samples

Problems noted during sample receipt shall be documented by the laboratory. The Project manager (or designee) shall be contacted immediately for problem resolution. All corrective actions shall be documented thoroughly.

Sample Holding Times

If any sample extractions and/or analyses exceed method holding time requirements, the Project manager (or designee) shall be notified immediately for problem resolution. All corrective actions shall be documented thoroughly.

Instrument Calibration

Sample analysis shall not be allowed until all laboratory instrumentation is properly calibrated in accordance with method requirements. If any initial/continuing calibration standards exceed method QC limits, recalibration must be performed and, if necessary, samples back to the previous acceptable continuing calibration standard must be reanalyzed.

Method QC

All QC, including blanks, matrix spikes, matrix spike duplicates, surrogate recoveries, matrix spike blank samples, and other method-specified QC samples, shall meet the requirements of the referenced methods. Failure of method-required QC will result in the possible qualification of all affected data. If the laboratory cannot find any errors, the affected sample(s) shall be reanalyzed within method-required holding times to verify the presence or absence of matrix effects. If matrix effect is confirmed, the corresponding data shall be flagged accordingly using the flagging symbols and criteria as defined by the data validation guidelines identified in Section 12.2. If matrix effect is not confirmed, then the entire batch of samples may have to be reanalyzed. The Project manager shall be notified as soon as possible to discuss possible corrective actions should unusually difficult sample matrices be encountered.

Calculation Errors

All analytical results must be reviewed systematically for accuracy prior to submittal. If upon data review, calculation and/or reporting errors exist, the laboratory will be required to reissue the analytical data report with the corrective actions appropriately documented in the case narrative.

5.8 Data Reduction, Validation, and Usability

For all analyses, NYSDEC ASP Category B deliverable requirements will be employed for documentation and reporting of all data. The standard NYSDEC Data Package Summary will be completed by the analytical laboratory and included in the deliverable data packages. In addition, analytical results will be reported in a NYSDEC EQuIS electronic data deliverable (EDD) format.

Data Reduction

Laboratory analytical data are first generated in raw form at the instrument. These data may be either graphic or printed tabular form. Specific data generation procedures and calculations are found in each of the referenced methods. Analytical results must be reported consistently. Data for aqueous samples will be reported in concentrations of micrograms per liter (µg/L) or milligrams per liter (mg/L).

Identification of all analytes must be accomplished with an authentic standard of the analyte traceable to NIST or other reliable commercial sources. Individuals experienced with a particular analysis and knowledgeable of requirements will perform data reduction.

5.9 Data Evaluation

The effectiveness of the implementation of the QAPP and the QA/QC procedures will be assessed at various times to ensure that the data needs of each project continue to be met. This evaluation will include conducting data quality assessments on the data as it is received. In the event that the data is found to fall outside the parameters of the DQOs, additional assessments and corrective actions will be taken. The additional assessments may include, but are not limited to, a review of the sampling method, sample handling and storage methods, and or review of the laboratory management system.

5.9.1 Data Quality Assessment

An initial quality assessment of the data should be made by the laboratory to ensure that the analytical DQOs are achieved. The assessment will include, but not be limited to, ensuring that the sample preparation and analyses were performed within the specified holding times for each analysis, identification of any source of contamination, and performing a review for internal laboratory quality control. The laboratory will note any QC deficiencies in the final laboratory report.

Hold time criteria begins at the time of sample collection. In order to remain in compliance with each analytical method, the sample extraction or preparation process must be completed as described by each analytical method prior to any necessary extract cleanup and/or volume reduction procedures, and must be completed within the specified time frame in accordance with EPA guidelines. The analysis is considered finished when all analytical runs, including dilutions and any required re-analyses, are completed.

5.9.2 Data Validation

Data validation, if applicable, will be performed for any supplemental site characterization and design activities. Data validation of monitoring data will not be performed unless the assessment of the analytical results warrants further evaluation. Data validation will be performed by a qualified chemist or data validation Consultant. Data validation is a review of the supplied data documentation to assess data quality. All analytical data for which validation is performed will be evaluated against the DQOs presented in this program specific QAPP, and the analytical method criteria. All program analytical data will be reviewed and evaluated according to the criteria established in this QAPP, and summarized in validation memos thereafter. In the case of parameters for which no criteria have been established in this QAPP, the laboratory's control limits will be used. All qualification will be documented in the validation reports and all professional judgment assessments will be clearly documented.

6.0 REFERENCES

United States Environmental Protection Agency. *USEPA Guidance for Quality Assurance Project Plans*, USEPA/QA/G-5, USEPA/600/R-98/018. February 1998.

United States Environmental Protection Agency. *USEPA Guidance for Quality Assurance Project Plans for Environmental Data Operations*. USEPA QA/R-5.March 2001.

United States Environmental Protection Agency. *Guidance for Data Quality Assessment, Practical Methods for Data Analysis.* USEPA QA/G-9, QA97 Version. July 2001.

United States Environmental Protection Agency. *Guidance for the Data Quality Objectives Process*. USEPA/QA/G-4, USEPA/600/R-96/055. August 2001.

United States Environmental Protection Agency. *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. USEPA*/540/R-99/008. October 1999.

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