REMEDIAL INVESTIGATION WORK PLAN

Western New York Workforce Training Center (C915310)
683 Northland Avenue
Buffalo, New York

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1.0 INTRODUCTION

NorDel II, LLC (NorDel) submitted a Draft Remedial Investigation Work Plan (RIWP) with the completed Brownfield Cleanup Program Application (under separate cover) on October 6, 2016. This document is the revised RIWP that incorporates revisions requested by the New York State Department of Environmental Conservation (NYSDEC) in a letter dated November 4, 2016

This RIWP includes a summary of site history, a summary of previous environmental assessments and investigations, a description of the Site geologic and Hydrogeologic setting, a summary of the subsurface features and sensitive receptors, and a plan for further delineation of areas of concern identified previously by others.

1.1 Site Setting

The Site is located at 683 Northland Avenue in the City of Buffalo, New York (Figure 1) on approximately 7.25 acres of land. The Site elevation along Niagara Street (eastern side of the Site) is approximately 645 feet above sea level and the Site slopes to the southwest. The Site is developed with an approximately 235,000 square foot (sf) factory building complex which comprises a four-story office area on the north side along Northland Avenue, a series of connecting ten manufacturing spaces, and a detached one-story shed located on the west side of the facility.

The Site is located in an urban setting with parking areas along Northland Avenue north of the Site and commercial/industrial properties along Northland Avenue to the east and west of the site. The Site is bordered to the south by the New York Central Railroad.

1.2 Site Background

The 683 Northland Avenue property is land zoned for manufacturing and comprises approximately 235,000 sf of buildings that were constructed between 1910 and 1981. The buildings are now vacant and were most recently used for miscellaneous storage. The former Niagara Machine and Tool Co. industrial complex is located on the south side of Northland Avenue between Chelsea Place and Longview Avenue. The building complex is comprised of a four-story office area on the north side along Northland Avenue, a series of ten connecting manufacturing spaces and a detached one-story shed located on the west side of the facility.

The building complex developed from numerous building expansions between 1911 through 1983. Niagara Machine and Tool primarily manufactured tools and machines for working with sheet metal, specializing in presses, punches, and rotary sheets at the Site. Operations at the plant included welding, steel fabricating, forging, and machining.

Despite being erected over several decades, building foundations, floor slabs, support columns, exterior walls, and roof framing systems throughout the various structures remain intact.

The Office portion of the building (approximately 35,000 sf) and approximately 52,000 sf of the former manufacturing area is slated for reuse as the Western New York Workforce Training Center to be redeveloped with funding from Governor Anrew Cuomo's "Buffalo Billion" redevelopment initiative and New York Power Authority. This re-use will require cleaning and stabilization of the manufacturing portion of the structure and improvements to the office building to support training center operations. The work would include, at a minimum, asbestos abatement, select demolition/removal of contaminated wood block flooring and unneeded equipment, industrial cleaning, brick repair, and roof, door, and window replacement.

1.3 Project Goals and Scope

The RIWP has been developed to achieve the following BCP objectives.

- To define the nature and extent of contamination on the Site.
- To identify if residual contaminant source areas are present on the Site.

- To determine whether remedial action is needed to protect human health and the environment.
- To produce data of sufficient quantity and quality to support the remediation of the Site, if warranted.

This RIWP was developed in general accordance with the NYSDEC's Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER-10), dated May 2010.

Specifically, this RIWP provides a summary of environmental conditions including the following information.

- Relevant information from existing environmental reports and previously conducted Site investigations.
- Technical overview and findings from previous reports.
- Planned investigation activities as outlined in Section 2.0 of the RIWP (including soil, soil vapor, and groundwater investigations).
- Site base mapping, supporting figures presenting sampling results/data and locations of planned investigation activities.
- Field Sampling Plan (FSP).
- Quality Assurance Project Plan (QAPP).
- Site specific Health and Safety Plan (HASP) with Community Air Monitoring Plan (CAMP).
- Citizen Participation Plan (CPP).

1.4 Previous Site Investigations

In support of the redevelopment project, Fisher Associates (Fisher) completed a Phase I Environmental Site Assessment (dated January 2015) for the Site and completed Phase II Investigations (Phase II Report dated September 2015 and Supplemental Assessment Report dated January 2016). The findings of these investigations are summarized below.

1.4.1 2015 Phase I Environmental Assessment

Fisher completed the Phase I ESA in 2015 and identified numerous recognized environmental conditions (RECs) and environmental conditions that are of concern at 683 Northland Avenue including: oil-impacted wooden block floors; presence of aboveground and underground storage tanks (ASTs/USTs); numerous drums stored on-site; hydraulic lifts; potentially impacted pits and sumps; debris piles; transformers/electrical switch gear; lead-based paint (LBP); asbestos; and, mold.

The Phase I report also noted that there was an on-site rail spur, transformers, and electrical switch gear. Suspect LBP, asbestos-containing materials (ACM), and mold were identified throughout the buildings. The Environmental Data Resources, Inc. (EDR) report summarized by Fisher identified the following USTs/ASTs as being registered by the owner of 683 Northland Avenue; however, the ownership was common to 631 Northland Avenue at the time the tanks were registered. The registered tanks include nine USTs and three ASTs including: three 23,380-gallon #6 fuel oil, two temporarily out of service, one in service; one 10,000-gallon "other" closed in 1991; two 1,000-gallon gasoline closed/removed; one 1,000-gallon diesel closed/removed; and, two 1,800-gallon other converted to non-regulated use.

The Phase I report indicated that a 2005 Phase II Investigation completed by Leader Professional Services, Inc. (Leader) identified exceedances of applicable NYSDEC recommended soil cleanup objectives (presumably Technical and Administrative Guidance Memorandum (TAGM) 4046 criteria) were detected in subsurface samples and pit water samples. Based on the Phase I findings, Fisher conducted Phase II investigations that included subsurface soil sampling and an extensive pit sampling program at 683 Northland Avenue.

1.4.2 Fisher Phase II Environmental Assessments

Fisher conducted sampling for their initial Phase II investigation in 2015. The Phase II Report prepared by Fisher included results from several other buildings that were in the project corridor. Data summary tables and sample location figures that relate to the 683 Northland Avenue property are provided in Attachments 1 and 2. A summary of sample locations where soil contaminants were reported in excess of NYSDEC Part 375 Commercial Use Soil Cleanup Objectives is provided in Figure 3.

Soil Sampling

Fisher advanced a total of 15 soil borings at 683 Northland Avenue with 11 borings in building interior areas and four in the exterior area west of the buildings (See Figure 2 in Attachment 1). All borings were screened for potential contamination and Fisher collected soil samples for chemical analysis from exterior borings SB009 and SB019 as well as interior borings ASB5 and ASB8. Fisher submitted soil samples for analysis for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), Resource Conservation and Recovery Act (RCRA) Metals, and polychlorinated biphenyls (PCBs). No VOCs were detected in the soil samples at concentrations above NYSDEC Part 375 Commercial Soil Cleanup Objectives (CSCOs). Exceedances of CSCOs were reported in the exterior borings for PCB (Aroclor 1254), arsenic, barium, and benzo(a)pyrene (Figure 3). Exceedances of CSCOs were reported in the interior borings for metals (arsenic, cadmium, lead, and mercury) at ASB8 and for SVOCs (benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene) and ASB5 (Figure 3).

Based on the initial results, Fisher conducted supplemental sampling at 683 Northland Avenue in November 2015 and prepared a Supplemental Phase II Environmental Assessment report which is provided in Attachment 2. The supplemental investigation included six additional interior borings each of which was sampled for VOCs, SVOCs, PCBs and RCRA metals. Exceedances of CSCOs were identified for PCB (Aroclor 1254) at location ASB12.

Environmental Waste Sampling – Pits and Floors

Fisher collected pit liquid samples from AP1, AP2, AP3-L, AP3-S, AP4-L, AP5-L, AP6-L, AP7-L, AP8-L, AP9-L, AP10-L, AP11-L, AP-13L, AP-14L, AP15-L, AP16-S, AP17-L, AP18-L, and AP-19-L (See Figure 3, Attachment 1). The liquid samples were analyzed for VOCs, SVOCs, RCRA metals, Pesticides, and PCBs. VOCs detected in these liquid samples included 4-Methyl-2-pentanone, Acetone, m, p-Xylene, 1, 4-Dichlorobenzene, Ethylbenzene, o-Xylene, and Tetrachloroethene. SVOCs were detected in AP6-L, AP8-L, AP11-L, and AP13-L. RCRA Metals were detected in AP2-L, AP4-L, AP5-L, AP6-L, AP7-L, AP8-L, AP9-L, AP10-L, AP11-L, AP13-L, AP14-L, AP15-L, AP17-L, AP18-L, AP19-L , ASB-L, AS2-L, and AWLTF. PCBs were detected in AS2-L, AP3-L, and AP9-L.

The supplemental investigation consisted primarily of waste characterization for pit solids including RCRA hazardous waste characteristic testing and Toxicity Characteristic Leaching Procedure (TCLP) testing. Pit solids were reported to be non-hazardous. Limited testing of pit liquids was also conducted.

1.4.3 Pre-Design PCB Testing to Support Building Cleaning

As noted previously, the Site is to be redeveloped into a Workforce Training Center. In support of the intended re-use, LiRo began to develop comprehensive building cleaning and asbestos abatement plans. Disposal of the wood flooring that is present within the manufacturing areas of the facility was a concern and therefore, LiRo conducted additional wood block testing as a pre-design investigation. The wood block is limited to the manufacturing portion of the building, but is present in nearly all manufacturing areas. The wood block flooring is installed over a concrete subfloor.

During the course of the wood block testing, LiRo identified elevated PCB concentrations in the wood block in the north-central area of the building. Based on that finding, LiRo also conducted concrete testing of the underlying concrete subfloor and subsurface soil sampling immediately below the concrete subfloor. The concrete was tested using chip samples from the top of the concrete (to a depth of approximately one inch). The results of the wood block testing, concrete testing, and sub-slab soil sampling are summarized in Figure 3. Based on the testing results, wood block and the concrete subfloor surface contain PCB concentrations in excess of 50 parts per million (ppm). The sub-slab soil samples reported PCB concentrations that were all less than 1 ppm.

There is no electrical equipment in the impacted portion of the Site and the contamination is likely a result of nearly 100 years of industrial use rather than a single release incident. Based on these findings, the floor removal and cleanup will require remediation/removal in accordance with the United States Environmental Protection Agency (USEPA) Toxic Substances Control Act (TSCA).

1.5 Physical Setting

The Site incorporates approximately 7.25 acres of fairly level land situated in the City of Buffalo, Erie County, New York. According to the United States Geological Survey (USGS) Topographic Map, Buffalo NE (1965), the Site lies at approximately 645 feet above Mean Sea Level.

1.5.1 Geologic Setting

The Site is located in the Erie-Ontario Lowlands physiographic province of New York State. Low Plains with little relief characterize the province with glacial deposition and shoreline deposits having modified topography. Erie County was buried by glacial ice and during subsequent retreats, glacially eroded soil and bedrock material were redeposited as a mixture of unconsolidated sediments across Erie County.

1.5.2 Hydrogeologic Setting

During the Phase II ESA, the approximate depth to the upper water-bearing zone was encountered between 4 and 12 feet below ground surface (ft bgs). Fill material was typically found across the site between depths of 2 to 14 ft bgs. Fill material was described as a fine to coarse sand, silt, clay, and gravel. Below the fill material was a natural brown silty clay. Fisher reported that the approximate direction of groundwater flow was from northeast to southwest.

While expected to be similar, the hydrogeological information from the Phase II ESA is based on off-Site monitoring wells. On-Site monitoring wells will be installed during the remedial investigation to confirm hydrogeological conditions and better define the direction of groundwater flow.

1.5.3 Subsurface Features

Based on the Fisher reports, five USTs are believed to be present at the Site. These include three

fuel oil tanks (reportedly 23,380-gallons each) located near the southwest corner of the building (Figure 2) and two oil tanks (reportedly 1,800-gallons) encased in concrete near the southeast portion of the Site. There is also a 6,000-gallon waste oil AST in a basement/vault in the south-central portion of the building.

All USTs and ASTs will be removed during Site redevelopment activities. All tank closures will be performed in accordance with the guidelines presented in DER-10, Section 5.5.

1.5.4 Sensitive Receptors

No sensitive ecological receptors such as wetlands have been identified adjacent to or near the Site. There is a residential area a short distance (approximately 180 feet to the nearest residence) to the north of the Site. The City of Buffalo is serviced by a municipal water supply.

2.0 REMEDIAL INVESTIGATION

The work described in this RIWP will be conducted in accordance with 6 New York Codes, Rules and Regulations (NYCRR) Part 375 – Brownfield Cleanup Regulations, and in general conformance with the NYSDEC DER-10 Technical Guidance for Investigation and Remediation. The remedial investigation (RI) work will also comply with the QAPP and FSP appended to this RIWP. The investigation process will involve sampling of soil/fill, native soil, soil vapor, and groundwater. Investigation and sampling locations may be modified during the field program based on observations made in the field.

The analytical data obtained during the RI will be compared to CSCOs and protection of groundwater soil cleanup objectives (SCOs) with the anticipated future use of the Site being commercial.

2.1 Purpose and Objectives

The purpose of this RIWP is to define the nature and extent of the contamination on the Site; to determine whether contamination is present that warrants remedial action; and, to provide data of sufficient quantity and quality to support development of a Remedial Action Alternatives Analysis, if remedial action is warranted for the Site.

This RIWP was developed to meet the following specific objectives:

- Delineate extent of PCB, SVOC, and metals soil contamination in exterior area along western margin of Site;
- Delineate extent of lead contaminated soil near interior boring ASB-08;
- Conduct additional borings for more complete characterization of subsurface soil contamination;
- Install groundwater monitoring wells to evaluate potential contamination and determine Site hydrogeological conditions;
- Collect sub-slab vapor data and soil vapor data to evaluate potential soil vapor intrusion concerns; and,

- Collect surface soil samples from the only non-paved areas that are present at the Site. The grass areas in the northwestern portion of the Site (shown on Figure 2), are the only areas where surface soil is exposed.

Soil borings will be sampled at the Site to determine the nature and extent of soil contamination. Monitoring wells will be installed at the Site to characterize the groundwater conditions at known or suspected contaminant source locations and also to evaluate hydraulic conditions at the Site. Soil vapor sampling will be performed to determine if soil vapor impacts present an unacceptable risk to human health.

Locations of the proposed samples are biased toward contaminant source areas or to delineate the extent of contamination in areas where historical samples exceeded CSCOs.

Proposed sampling locations are shown on Figure 4. Table 1 summarizes the proposed soil and groundwater sampling for each location.

2.1.1 Soil Investigation

In all work areas, LiRo's supervising geologist will screen soil from each core for the presence of organic vapors using a photoionization detector (PID) and will record field descriptions of the soil as well as PID readings.

Western Exterior Area

Fifteen soil borings and two monitoring well borings will be installed in the southwest portion of the Site in the vicinity of historic soil borings SB-09 and SB-19. Each soil boring will be advanced to the top of bedrock as directed by LiRo's supervising geologist. The sample intervals (for chemical analysis) are indicated on Table 1. A total of 34 investigative samples are proposed to be collected at these locations. Twenty-eight (28) of the samples will be collected and analyzed for delineation purposes. In the absence of PID or visual/olfactory evidence of petroleum contamination, these soil samples will be collected and analyzed for SVOCs, PCBs, and RCRA metals. If PID or visual/olfactory evidence of contamination is observed while drilling, the affected sample will also

be analyzed for VOCs. Six (6) of the samples will be collected and analyzed to confirm that the contamination in this area is fully characterized. These six soil samples will be collected and analyzed for VOCs, SVOCs, Pesticides, PCBs, TAL Metals, and Cyanide.

Delineation Area near ASB-08

Three soil borings and one monitoring well boring will be installed surrounding historical boring location ASB-08. Each soil boring will be advanced to the top of bedrock as directed by LiRo's supervising geologist. The sample intervals (for chemical analysis) are indicated on Table 1. In the absence of PID or visual/olfactory evidence of petroleum contamination, soil samples will be collected and analyzed for total RCRA metals and for leachable metals using both Toxicity Characteristic Leaching Procedure (TCLP) and Synthetic Precipitation Leaching Procedure (SPLP).

Additional Characterization Borings

Seven soil borings and four monitoring well borings will be installed in general characterization areas. Five of the soil borings and one of the monitoring well borings will be installed within the building in former manufacturing areas. Each soil boring will be advanced to the top of bedrock as directed by LiRo's supervising geologist. The sample intervals (for chemical analysis) are indicated on Table 1. One sample from each boring will be analyzed for VOCs, SVOCs, TAL metals (including cyanide), PCBs, and pesticides.

Additional Sub-Slab Soil PCB Testing

Based on the results of pre-design PCB testing, it does not appear that the PCB-contaminated wood block found in the former manufacturing areas within the building has migrated into the subsurface soil to any significant extent. The investigation of sub-slab soil will be deferred until after the wood block flooring has been removed and the underlying concrete floor has been inspected for cracks or other openings which may have allowed downward migration of PCB contamination into the underlying soil. The number and locations of these borings will be determined based on the inspection of the concrete floor. Soil samples will be collected from below the floor slab at 2-foot intervals to a depth of 4 feet (i.e. 0-2 feet below slab, 2-4 feet below slab) and analyzed for PCBs

Surface Soil Sampling

Surface soil samples (0 to 2 inches below vegetative cover) will be collected at four locations within two grass covered areas. In addition, one deeper (2 to 12 inches below vegetative cover) sample will be collected from each of the two grass covered areas. Each sample will be analyzed for SVOCs, TAL metals (including cyanide), PCBs, and pesticides.

2.1.2 Monitoring Well Installation and Groundwater Sampling

Six bedrock monitoring wells will be installed at the Site. One monitoring well will be installed in the northeast portion of the property (up-gradient), two monitoring wells will be installed within the building, and three monitoring wells will be installed in the southwest portion of the Site (presumed down-gradient). The locations of the monitoring wells are shown on Figure 4.

2.1.3 Soil Vapor Investigation

Five sub-slab vapor samples and two soil vapor samples will be collected at the Site. Two of the sub-slab samples will be collected from the within the former office/administration building area and three of the sub-slab samples will be collected from within the former manufacturing area. The soil vapor sample locations are located adjacent to the western margin of the former manufacturing area.

2.2 Soil Investigation Procedures

The soil investigation activities under this RIWP will be conducted in accordance with the field procedures detailed in the FSP (Attachment 3) and as described below.

2.2.1 Soil Borings

Soil borings will be advanced to the top of bedrock utilizing direct-push (macro-core sampling). Soils will be characterized and screened continuously for VOCs using a PID; any evidence of contamination (e.g., odor, staining, ash, cinders, slag, etc.) will be documented. Soil characterization and observations will be documented on log forms. Samples will be collected from the depth interval specified in Table 1.

2.3 Groundwater Monitoring Well Installation

Groundwater monitoring wells will be installed using procedures consistent with NYSDEC recommended practice as described below and in the FSP. The procedures will be modified if necessary based on field conditions. Based on the Phase II ESA soil boring logs, only limited groundwater was observed within the overburden soils. It is anticipated that the predominant groundwater flow in the vicinity of the Site is in the bedrock. All monitoring wells installed during the remedial investigation will be installed within the bedrock underlying the Site. Based on site conditions it is anticipated that bedrock monitoring wells will be installed to a depth of 20 to 25 feet below ground surface. Efforts will be made to ensure that wells are screened within the same geologic unit.

2.3.1 Bedrock Well Installation

Bedrock wells will be installed according to the procedures in the FSP. Based on site conditions, it is anticipated that bedrock monitoring wells will be installed to a depth of 20 to 25 feet below ground surface. Efforts will be made to ensure that wells are screened within the same geologic unit.

2.3.2 Well Development

Following installation, each monitoring well will be developed by surging, pumping, bailing, or a

combination thereof until the discharged water is relatively sediment free. Development water will be containerized within 55-gallon drums, and disposed of as per NYSDEC guidelines. The effectiveness of the development process will be monitored by recording measurements of temperature, pH, specific conductance, and turbidity using a portable water quality analyzer.

2.3.3 Groundwater Sampling

One complete round of groundwater sampling will be conducted a minimum of two weeks after completion of development activities. The groundwater sampling event will include water level monitoring and sample collection at each well.

Prior to sampling, the wells will be purged to remove water held in casing storage. If the well productivity is sufficient, the wells will be purged of at least three casing volumes prior to sampling. If the wells purge to dryness, the groundwater sample will be collected after the water level has returned to within 85 percent of the static condition. Groundwater samples will be analyzed for VOCs using USEPA Method 8260, SVOCs using Method 8270, PCBs using Method 8082, pesticides using Method 8081, TAL metals using Method 6010, and mercury using Method 7471.

2.4 Soil Vapor Investigation Procedures

Sub-slab vapor and soil vapor point installation and sampling will be conducted in general accordance with the New York State Department of Health (NYSDOH) Guidance for Evaluating Vapor Intrusion in the State of New York, dated October 2006, and in accordance with the FSP. The procedures are summarized in the sections below.

2.4.1 Soil Vapor Point Installation Procedure

Sub-slab vapor points will be installed within the building interior at the locations shown on Figure 4 using hand tools. The sub-slab probes will be completed as temporary points and will be

constructed using inert tubing (polyethylene or Teflon) extended no more than 2 inches into the sub-slab material. The probes will be backfilled (if needed) using a porous, inert backfill material (e.g., glass beads, washed #1 crushed stone, etc.) allowing a sampling zone immediately below the floor slab. The probe will be sealed to the surface with non-VOC-containing and non-shrinking modeling clay or equivalent.

Soil vapor probes will be installed to a depth corresponding to the depth of building footing foundations or to a depth of 1 foot above groundwater as determined in the field. The probes will be backfilled using a porous, inert backfill material (e.g., glass beads, washed #1 crushed stone, etc.) allowing a sampling zone of 1 to 2 feet in length, and sealed at the ground surface to prevent any inflow from ambient surface air. In order to prevent short circuiting of ambient air into the subsurface, the soil vapor probes will be sealed above the sampling zone with bentonite slurry for a minimum distance of three feet.

2.4.2 Soil Vapor Sampling Procedure

Soil vapor sampling will be conducted in conformance with the NYSDOH Guidance.

Sampling will occur for the duration of greater than two hours. Samples will be collected in appropriate sized Summa canisters that have been certified clean by the laboratory and samples will be analyzed by using USEPA Method TO-15. Flow rate for both purging and sampling will not exceed 0.2 liters per minute (L/min). 24-hours following soil vapor probe installation, one to three implant volumes shall be purged prior to the collection of any soil-gas samples.

As part of the vapor intrusion evaluation, a tracer gas will be used at the soil vapor sampling points in accordance with NYSDOH protocols to serve as a quality assurance/quality control (QA/QC) device to verify the integrity of the soil vapor probe seal. A container (box, plastic pail, etc.) will serve to keep the tracer gas in contact with the probe during testing. A portable monitoring device will be used to analyze a sample of soil vapor for the tracer gas prior to sampling. If the tracer sample results show a significant presence of the tracer, the probe seals will be adjusted to prevent infiltration.

2.5 Equipment Decontamination Procedures

2.5.1 Hand Sampling Equipment

Reusable equipment used to collect samples, such as sample trowels and mixing bowls, will be hand cleaned using a sequence of an alconox/water wash and distilled water rinse between each use. Dedicated (i.e., disposable) sampling equipment is for one-time use and will not require decontamination. Field instruments (i.e., PID, water quality meters) will be decontaminated by wiping with a damp cloth or in accordance with the manufacturer's recommendations.

2.5.2 Drilling Equipment

All reusable sampling equipment (i.e., split-spoons, core samplers, and augers/drilling rods) will be decontaminated between uses with standard techniques (i.e., alconox-water wash and distilled water rinse or steam clean). The drilling Contractor will be required to build a temporary decontamination pad to conduct large equipment decontamination at the Site.

2.6 Sample Handling and Analysis

Soil and groundwater samples will be collected into laboratory supplied, pre-cleaned sample jars. The jars will be labeled with a unique sample identification code, packed in a cooler with ice, and shipped under chain-of-custody control to a New York State Certified Laboratory analytical laboratory. Sample bottle requirements and holding times as well as details regarding laboratory QC procedures and field QA sampling are detailed in the QAPP. Soil samples will be collected and analyzed for chemical parameters as outlined in Table 1.

2.7 Surveying and Mapping

All sampling and monitoring well locations will be surveyed for horizontal and vertical coordinates by a licensed New York State surveyor.

2.8 Investigation Derived Waste

Auger cuttings, development water, purge water, and equipment decontamination water will be containerized, characterized, and disposed of at an off-site facility. Used personal protective equipment will be placed in contractor grade trash bags for off-site disposal.

2.9 Supporting Documents

Supporting Documents have been prepared and are provided as stand-alone attachments to this RIWP. The documents include:

- A FSP which describes the procedures and methods that will be employed to complete the sampling field work (Attachment 3).
- A QAPP which describes the procedures, methods, and means that will be employed to assure the quality and defensibility of data generated during the investigation (Attachment 4).
- A project Health and Safety Plan (HASP) with Community Air Monitoring Plan (CAMP) which details procedures and protocols that will be implemented to protect site workers and the surrounding community during the investigation including levels of personal protective equipment for planned Site activities, CAMP air monitoring requirements, action levels, and emergency response procedures (Attachment 5).
- A Citizen Participation Plan (CPP) which presents the means by which community members can be informed and involved in the BCP process and which meets the requirements of NYSDEC DER-23 and DER-10 guidance (Attachment 6).

3.0 REPORTING

Upon completion of the field investigation, LiRo will evaluate raw Site data and determine the need for additional Site investigations. The results of all Site investigations will be summarized in a comprehensive RI Report. The RI Report will present a detailed summary of Site physical conditions, chemical conditions, and potential risks to human health or the environment. The report will be structured in accordance with NYSDEC DER-10 guidance and will contain all required elements to support the development of remedial alternatives and preparation of a Remedial Action Work Plan (RAWP).

4.0 SCHEDULE

The schedule is dependent on acceptance into the BCP. We anticipate the following schedule:

- Submit BCP Application and RIWP – October 2016
- Formal acceptance into program and conduct RI field work – January 2017
- Evaluate data and submit Draft RIR – March 2017

TABLES

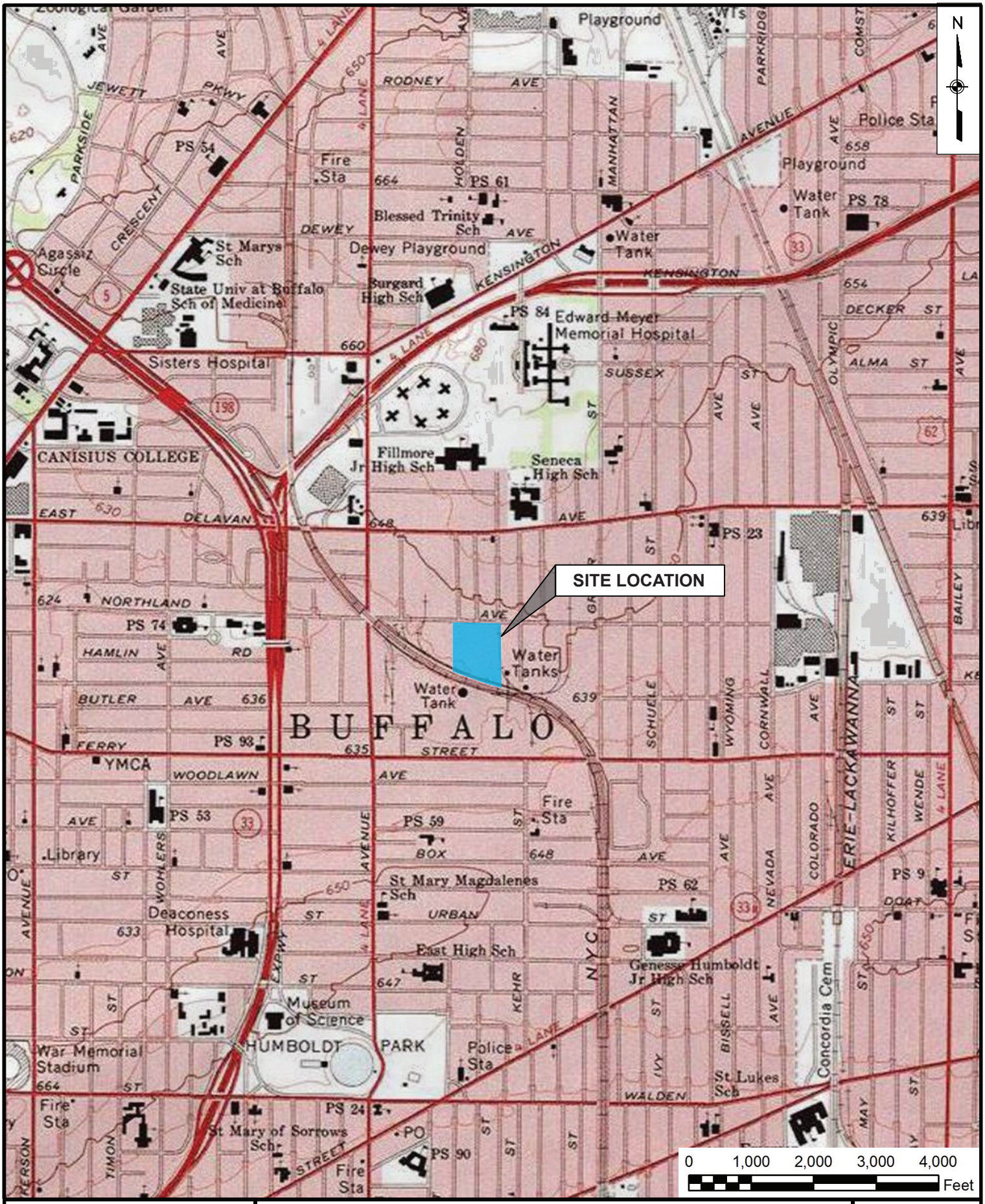
TABLE 1
Proposed Soil and Groundwater Sampling - Remedial Investigation
Western New York Workforce Training Center

Proposed Sample Location	Proposed Sampling Method	Proposed Boring Depth	Rationale/Target	Proposed Soil Sample Depth	Proposed Analytical Parameters
LB-01 through LB-15	Geoprobe	Top of Bedrock (anticpated ~ 8 feet)	Delineate extent of contamination western exterior portion of Site	0 - 4 feet 4 feet to Bottom	SVOC, PCBs, RCRA Metals* or Full Suite (see Note 1)
LW-01/LW-02 (soil)	Auger/ Splitspoon	Install Bedrock Well			
LB-16 through LB-20, LB-24, LB-25	Geoprobe	Top of Bedrock	General Site Characterization Building Interior, Loading Dock Area and Upgradient Area	Interval with Screening Evidence of Contamination or 1 feet to 3 feet if no Evidence	VOC, SVOC, Pesticides, PCBs, TAL Metals (+ cyanide)
LB-21 through LB-23	Geoprobe	Top of Bedrock	Delineate Extent of Metals Contamination Contamination Near ASB-08	0 - 4 feet	RCRA Metals (total), TCLP Metals and SPLP Metals
LW-05	Auger/ Splitspoon	Install BedrockWell			
LW-04	Auger/ Splitspoon	Install Bedrock Well	Evaluate Upgradient Conditions	Interval with Screening Evidence of Contamination or 1 feet to 3 feet if no Evidence	VOC, SVOC, Pesticides, PCBs, TAL Metals (+ cyanide)
LW-03	Auger/ Splitspoon	Install Bedrock Well	General Site Characterization Downgradient of Fuel Oil UST Area	Interval with Screening Evidence of Contamination or 1 feet to 3 feet if no Evidence	VOC, SVOC, Pesticides, PCBs, TAL Metals (+ cyanide)
LW-06	Auger/ Splitspoon	Install Bedrock Well	General Site Characterization Downgradient of Waste Oil AST	Interval with Screening Evidence of Contamination or 1 feet to 3 feet if no Evidence	VOC, SVOC, Pesticides, PCBs, TAL Metals (+ cyanide)
SFC-1 through SFC-4	Hand Trowel	0 to 2 inches below Vegetative Cover	Surface Soil - Only Unpaved Areas	0 to 2 inches	SVOC, Pesticides, PCBs, TAL Metals (+ cyanide)
SFC-2 and SFC-4	Hand Trowel	2 to 12 inches below Vegetative Cover	Surface Soil - Only Unpaved Areas	2 to 12 inches	SVOC, Pesticides, PCBs, TAL Metals (+ cyanide)
LW-01 through LW-06 (groundwater)	Auger/ Splitspoon	Install Bedrock Well	Evaulate Groundwater Quality and Hydrogeologic Conditions	Groundwater	VOC, SVOC, Pesticides, PCBs, TAL Metals (+ cyanide)

* If screening shows evidence of contamination, grab sample will be collected for VOC analysis.

Notes
1. Six of these samples will be analyzed for Full Suite of Contaminatinants: VOC, SVOC, Pesticides, PCBs, TAL Metals (+ cyanide)

FIGURES



LiRo-Engineers, Inc.
690 Delaware Ave.
Buffalo, New York

683 NORTHLAND AVENUE
TOPOGRAPHIC SITE LOCATION MAP

FIGURE NO.

1

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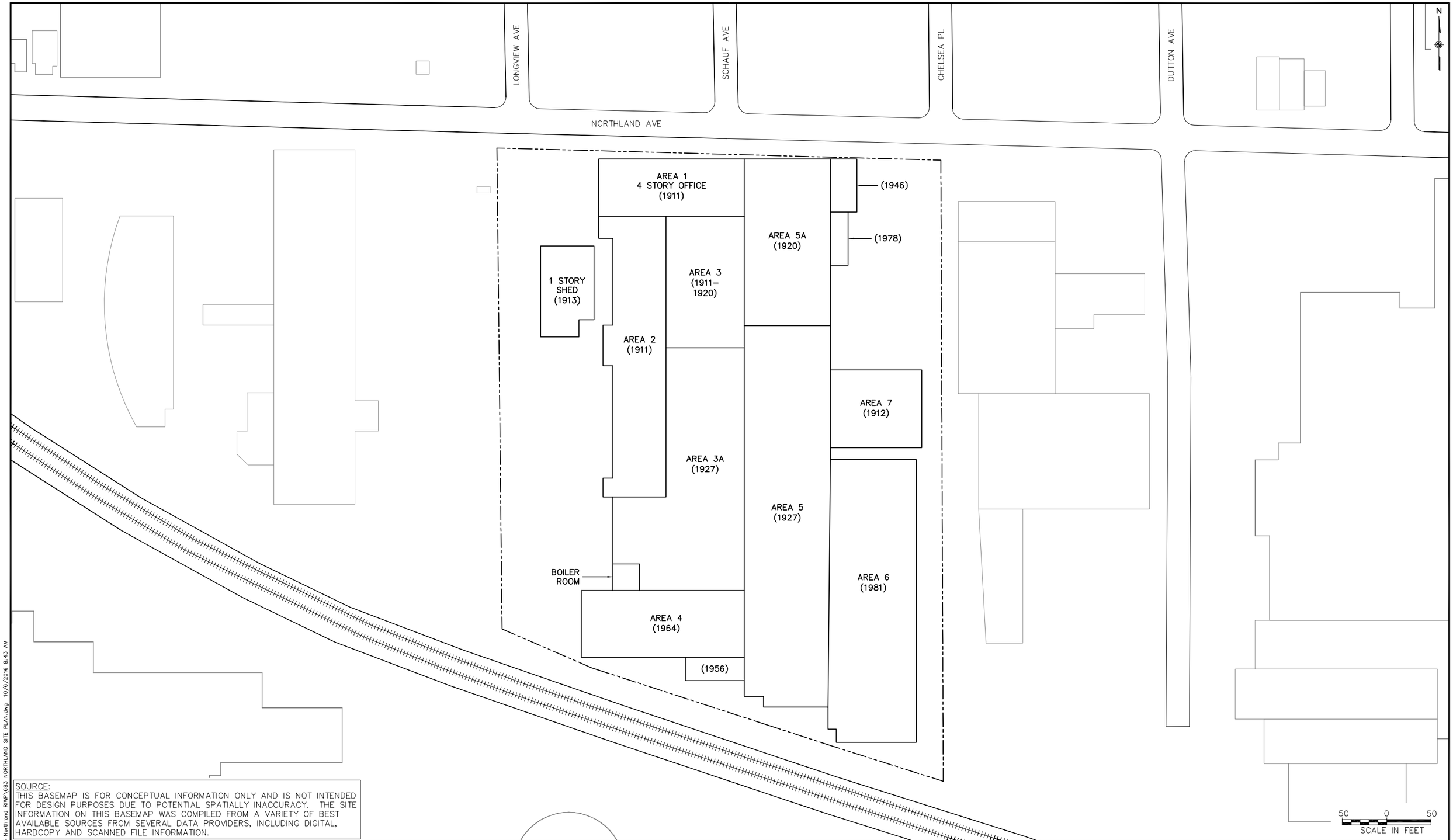


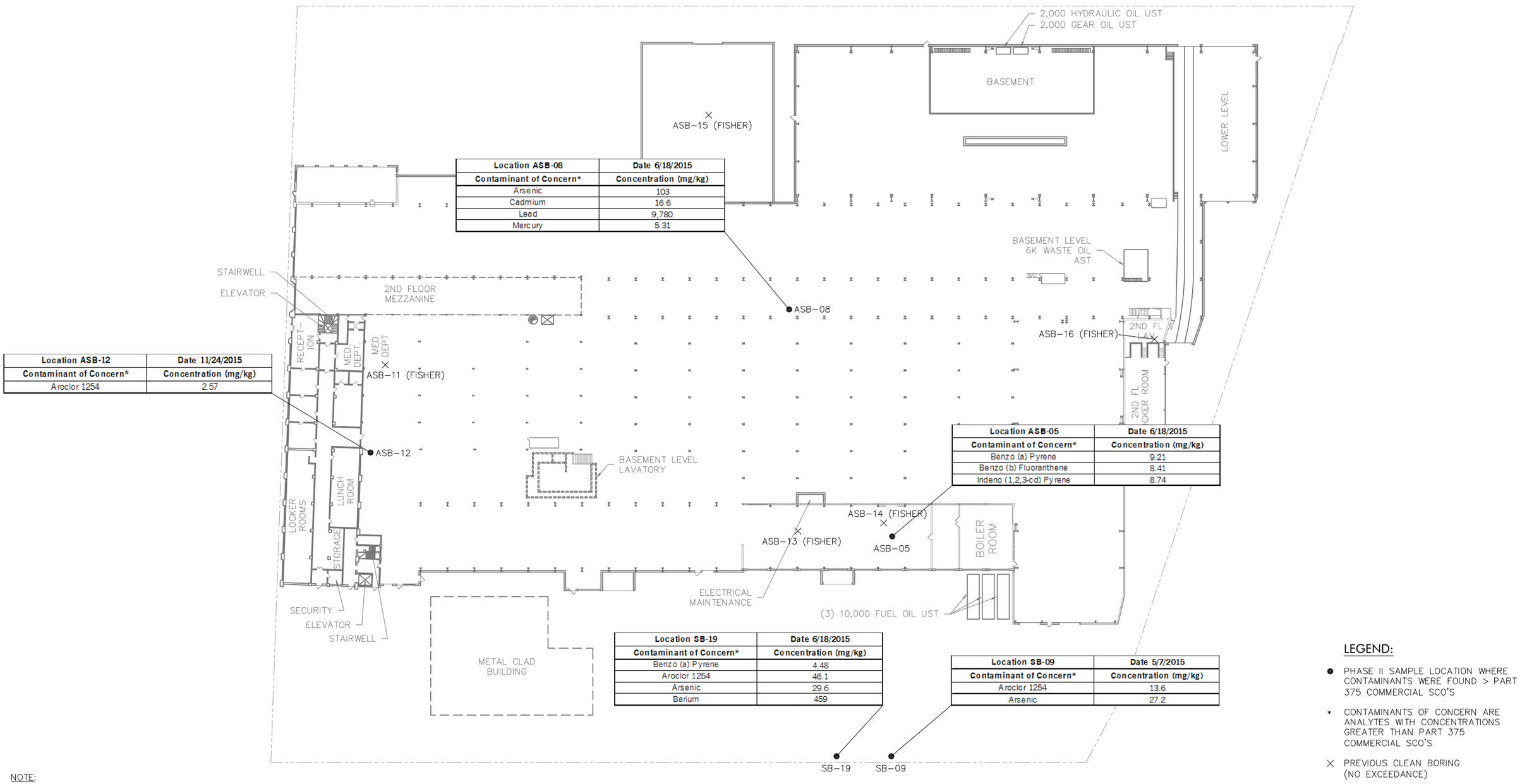
SOURCE:
THIS BASEMAP IS FOR CONCEPTUAL INFORMATION ONLY AND IS NOT INTENDED FOR DESIGN PURPOSES DUE TO POTENTIAL SPATIALLY INACCURACY. THE SITE INFORMATION ON THIS BASEMAP WAS COMPILED FROM A VARIETY OF BEST AVAILABLE SOURCES FROM SEVERAL DATA PROVIDERS, INCLUDING DIGITAL, HARDCOPY AND SCANNED FILE INFORMATION.

NO.	DATE	DESCRIPTION
REVISIONS		

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, New York

PROJ. ENG.:	CLIENT: NORDEL II, LLC	JOB TITLE AND LOCATION: 683 NORTHLAND AVENUE BROWNFIELD CLEANUP	LIRO JOB NO.: 15–029–1054
DESIGNED BY:			SHEET OF
CHECKED BY:		DRAWING TITLE: 683 NORTHLAND AVE SITE DEVELOPMENT PLAN	FIGURE NO. 2
DRAWN BY: A.M.K.	DATE: SEPTEMBER 2016	SCALE: AS SHOWN	

J:\15-029-1054 BUDC\CAD\683 Northland RIWP\683 NORTHLAND SITE PLAN.dwg 10/6/2016 8:43 AM



NOTE:
FLOOR PLANS DERIVED FROM HISTORICAL DRAWINGS AND FIELD OBSERVATIONS OF CURRENT CONDITIONS. THE FLOOR PLANS ARE PROVIDED FOR PLANNING PURPOSES. INTERIOR WALLS AND PARTITIONS WERE NOT SURVEYED AND LOCATIONS ARE APPROXIMATED BASED ON FIELD MEASUREMENTS.

LEGEND:

- ● PHASE II SAMPLE LOCATION WHERE CONTAMINANTS WERE FOUND > PART 375 COMMERCIAL SCO'S
- * CONTAMINANTS OF CONCERN ARE ANALYTES WITH CONCENTRATIONS GREATER THAN PART 375 COMMERCIAL SCO'S
- × PREVIOUS CLEAN BORING (NO EXCEEDANCE)

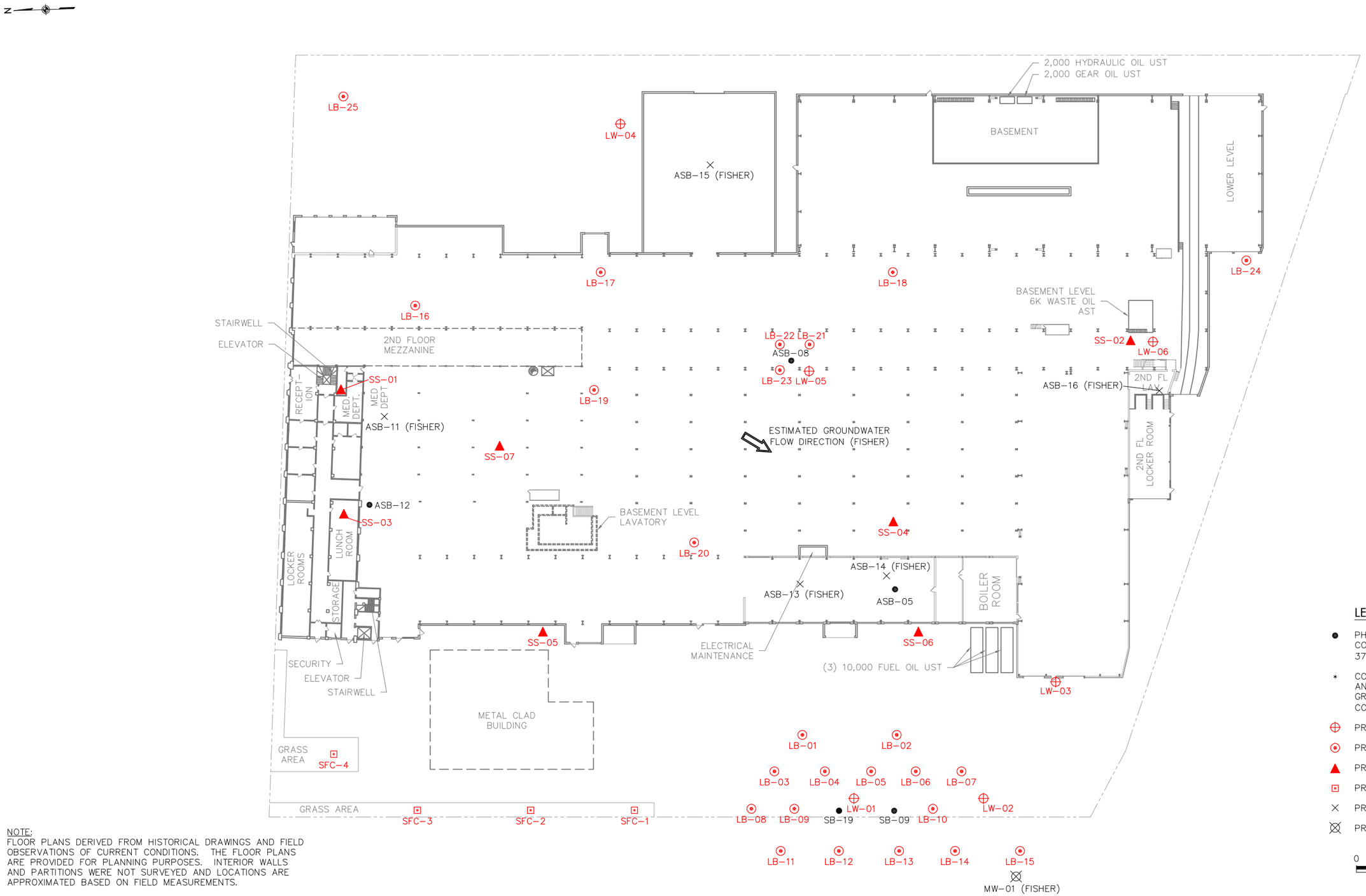
0 16 32 64
SCALE IN FEET

NO.	DATE	DESCRIPTION
		REVISIONS

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, New York

PROJ. ENG.:	CLIENT:	JOB TITLE AND LOCATION:	LIRO JOB NO.:
DESIGNED BY:	NORDEL II, LLC	683 NORTHLAND AVENUE BROWNFIELD CLEANUP	15-029-1054
CHECKED BY:			SHEET OF
DRAWN BY: A.M.K.	DATE: SEPTEMBER 2016 / SCALE: AS SHOWN	DRAWING TITLE: HISTORICAL SUB-SURFACE SAMPLE LOCATIONS AND PART 375 COMMERCIAL SCO EXCEEDANCES	FIGURE NO. 3

J:\15-029-1054 BUDC\CAD\683 Northland RWP\683 Northland Ave Phase II COC.dwg 10/6/2016 8:36 AM



NOTE:
FLOOR PLANS DERIVED FROM HISTORICAL DRAWINGS AND FIELD OBSERVATIONS OF CURRENT CONDITIONS. THE FLOOR PLANS ARE PROVIDED FOR PLANNING PURPOSES. INTERIOR WALLS AND PARTITIONS WERE NOT SURVEYED AND LOCATIONS ARE APPROXIMATED BASED ON FIELD MEASUREMENTS.

LEGEND:

- ● PHASE II SAMPLE LOCATION WHERE CONTAMINANTS WERE FOUND > PART 375 COMMERCIAL SCO'S
- * CONTAMINANTS OF CONCERN ARE ANALYTES WITH CONCENTRATIONS GREATER THAN PART 375 COMMERCIAL SCO'S
- ⊕ PROPOSED MONITORING WELL
- ⊙ PROPOSED BORING
- ▲ PROPOSED SUB-SURFACE VAPOR POINT
- ⊡ PROPOSED SURFACE SOIL SAMPLE
- × PREVIOUS CLEAN BORING
- ⊠ PREVIOUS CLEAN MW

0 16 32 64
SCALE IN FEET

NO.	DATE	DESCRIPTION
REVISIONS		

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, New York

PROJ. ENG.:	
DESIGNED BY:	
CHECKED BY:	
DRAWN BY:	A.M.K.
CLIENT:	NORDEL II, LLC
DATE:	SEPTEMBER 2016
SCALE:	AS SHOWN
JOB TITLE AND LOCATION:	683 NORTHLAND AVENUE BROWNFIELD CLEANUP
LIRO JOB NO.:	15-029-1054
SHEET	OF
DRAWING TITLE:	PROPOSED SAMPLING LOCATIONS
FIGURE NO.	4

J:\15-029-1054 BUDC\CAD\683 Northland RWP\683 Northland Ave Prop Sample Loc.dwg 10/6/2016 8:37 AM

ATTACHMENT 1

Fisher Phase II ESA Excerpts

FIGURE 2
BUILDING A&B SOIL BORING AND MONITORING WELL LOCATIONS
NORTHLAND AVENUE PROPERTIES
683 NORTHLAND AVE, BUFFALO, NY 14211

LEGEND

- Internal Soil Boring (ASB1) (BSB1)
- External Soil Boring (SB008)
- Monitoring Well (MW-1)
- Railroad
- Buildings A & B

0 100 Feet

N

REGIONAL MAP

AUTHOR: AK/DT
REVISION DATE: 8/17/2015 8:45:47 AM
Coordinate System: NAD 1983 StatePlane New York West FIPS 3103 Feet
Projection: Transverse Mercator
DATA SOURCES:
Aerials: ESRI World Imagery http://goto.arcgisonline.com/maps/World_Imagery
Roads: NYS ALIS 2013 http://www.nysgis.state.ny.us/

*Samples collected June 2015

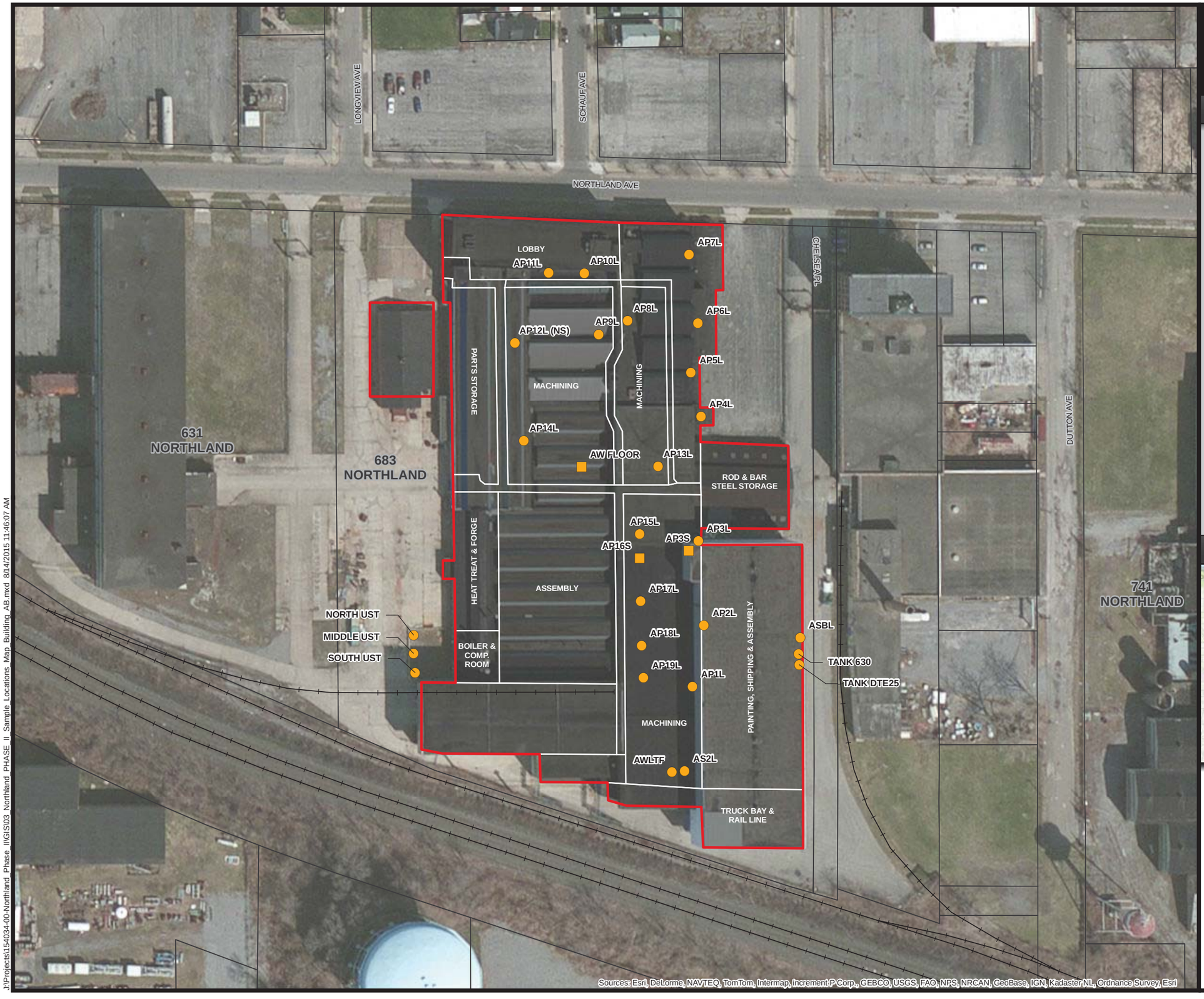
FISHER ASSOCIATES
www.fisherassoc.com

LONGVIEW AVE
SCHAUF AVE
NORTHLAND AVE
CHELSEA PL
DUTTON AVE
631 NORTHLAND
683 NORTHLAND
741 NORTHLAND
LOBBY
ASB2
ASB1
BSB1
ASB3
PARTS STORAGE
MACHINING
MACHINING
SB008
ASB6
ASB7
ROD & BAR STEEL STORAGE
MW-2
HEAT TREAT & FORGE
ASB4
ASB8
SB019
SB009
ASB5
ASSEMBLY
SB010
SB011
BOILER & COMP. ROOM
MACHINING
PAINTING, SHIPPING & ASSEMBLY
MW-1
ASB9
ASB10
TRUCK BAY & RAIL LINE

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri

J:\Projects\154034-00-Northland_Phase_II\GIS\02_Northland_PHASE_II_Soil_Borings_Building_AB.mxd 8/17/2015 8:45:47 AM

FIGURE 3
BUILDING A&B SURFACE LIQUIDS AND SOLIDS SAMPLE LOCATIONS
NORTHLAND AVENUE PROPERTIES
683 NORTHLAND AVE, BUFFALO, NY 14211



LEGEND

- Solid Sample Location (AP3S)
- Liquid Sample Location (AP3L)
- Railroad
- Parcel Boundary
- Site Buildings A & B

NS = Not Sampled
P1 = Former Machinery Pits
AWFLOOR = Wood Block
UST = Underground Storage Tank
ASB = Sump Basement

0 100 Feet

N

REGIONAL MAP

AUTHOR: AK/DT
REVISION DATE: 8/14/2015 11:46:07 AM
Coordinate System: NAD 1983 StatePlane New York West FIPS 3103 Feet
Projection: Transverse Mercator
DATA SOURCES:
Aerials: ESRI World Imagery http://goto.arcgisonline.com/maps/World_Imagery
Roads: NYS ALIS 2013 http://www.nysgis.state.ny.us/

*Samples collected June 2015

FISHER ASSOCIATES
www.fisherassoc.com

J:\Projects\154034-00-Northland_Phase_II\GIS\03_Northland_PHASE_II_Sample_Locations_Map_Building_AB.mxd 8/14/2015 11:46:07 AM

Table 1
Summary of Volatile Organic Compounds Within Soil Boring Samples
Northand Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compounds	Concentration (ppm)		
~~SB006 (0-4')~~	~~NONE DETECTED~~	~~NA~~	~~NA~~	~~NA~~
SB009 (0-4')	1,2,4 - Trimethylbenzene	2.27	190	380
	1,3,5 - Trimethylbenzene	1.35	190	380
	m,p - Xylene	0.073	500	1000
	Methylcyclohexane	0.143	NA	NA
	Naphthalene	0.239	NA	NA
	p-Isopropyltoluene	0.167	NA	NA
	sec - Butylbenzene	0.139	390	1000
~~SB010 (4-8')~~	~~Acetone~~	~~0.12~~	~~500~~	~~1000~~
	~~1,2,4 - Trimethylbenzene~~	~~0.025~~	~~190~~	~~380~~
	~~Isopropylbenzene~~	~~0.147~~	~~NA~~	~~NA~~
	~~m,p - Xylene~~	~~0.026~~	~~500~~	~~1000~~
	~~Methylcyclohexane~~	~~0.036~~	~~NA~~	~~NA~~
	~~n-Butylbenzene~~	~~0.091~~	~~NA~~	~~NA~~
	~~n-Propylbenzene~~	~~0.1~~	~~500~~	~~1000~~
	~~sec - Butylbenzene~~	~~0.163~~	~~390~~	~~1000~~
	~~Tetrachloroethene~~	~~0.016~~	~~150~~	~~300~~
~~SB015 (4-9')~~	~~NONE DETECTED~~	~~NA~~	~~NA~~	~~NA~~
~~SB016 (4-8')~~	~~NONE DETECTED~~	~~NA~~	~~NA~~	~~NA~~
~~SB018 (4-8')~~	~~NONE DETECTED~~	~~NA~~	~~NA~~	~~NA~~
SB019 (0-4')	1,2,4 - Trimethylbenzene	0.014	190	380
	1,3,5 - Trimethylbenzene	0.019	190	380
	Carbon disulfide	0.019	NA	NA
	Methylcyclohexane	0.013	NA	NA
	Naphthalene	0.049	NA	NA
	p-Isopropyltoluene	0.016	NA	NA
	sec - Butylbenzene	0.009	390	1000

NOTES: Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 2
Summary of Semi-Volatile Compounds Within Soil Boring Samples
Northand Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compounds	Concentration (ppm)		
~~SB006 (0-4')~~	~~Acenaphthene~~	~~0.443~~	~~500~~	~~1000~~
	~~Benzo (a) anthracene~~	~~1.27~~	~~5.6~~	~~11~~
	~~Benzo (a) pyrene~~	~~1.24~~	~~1.0~~	~~1.1~~
	~~Benzo (b) fluoranthene~~	~~1.55~~	~~5.6~~	~~11~~
	~~Benzo (g,h,i) perylene~~	~~0.819~~	~~500~~	~~1000~~
	~~Benzo (k) fluoranthane~~	~~0.550~~	~~56~~	~~110~~
	~~Chrysene~~	~~1.19~~	~~56~~	~~110~~
	~~Fluoranthene~~	~~2.24~~	~~NA~~	~~NA~~
	~~Indeno(1,2,3-cd)pyrene~~	~~1.10~~	~~5.6~~	~~11~~
	~~Phenanthrene~~	~~1.29~~	~~500~~	~~1000~~
	~~Pyrene~~	~~1.85~~	~~500~~	~~1000~~
SB009 (0-4')	Anthracene	0.357	500	1000
	Benzo (a) anthracene	0.952	5.6	11
	Benzo (a) pyrene	0.909	1.0	1.1
	Benzo (b) fluoranthene	0.604	5.6	11
	Benzo (g,h,i) perylene	0.770	500	1000
	Benzo (k) fluoranthane	1.15	56	110
	Chrysene	1.11	56	110
	Fluoranthene	2.30	500	1000
	Indeno(1,2,3-cd)pyrene	0.94	5.6	11
	Naphthalene	0.42	500	1000
	Phenanthrene	1.72	500	1000
	Pyrene	2.37	500	1000

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 2
Summary of Semi-Volatile Compounds Within Soil Boring Samples
Northand Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compounds	Concentration (ppm)		
~~SB010 (4-8')~~	~~Acenaphthene~~	~~0.332~~	~~500~~	~~1000~~
	~~Benzo (a) anthracene~~	~~0.422~~	~~5.6~~	~~11~~
	~~Benzo (a) pyrene~~	~~0.896~~	~~1.0~~	~~1.1~~
	~~Benzo (b) fluoranthene~~	~~0.494~~	~~5.6~~	~~11~~
	~~Benzo (g,h,i) perylene~~	~~0.506~~	~~500~~	~~1000~~
	~~Benzo (k) fluoranthane~~	~~0.985~~	~~56~~	~~110~~
	~~Chrysene~~	~~1.42~~	~~56~~	~~110~~
	~~Fluoranthene~~	~~1.70~~	~~500~~	~~1000~~
	~~Indeno(1,2,3-cd)pyrene~~	~~0.587~~	~~5.6~~	~~11.0~~
	~~Phenanthrene~~	~~1.26~~	~~500~~	~~1000~~
	~~Pyrene~~	~~1.62~~	~~500~~	~~1000~~
~~SB015 (4-9')~~	~~NONE DETECTED~~	~~NA~~	~~NA~~	~~NA~~
~~SB016 (4-8')~~	~~Benzo (a) anthracene~~	~~1.08~~	~~5.6~~	~~11~~
	~~Benzo (a) pyrene~~	~~1.9~~	~~1.0~~	~~1.1~~
	~~Benzo (b) fluoranthene~~	~~2.11~~	~~5.6~~	~~11~~
	~~Benzo (g,h,i) perylene~~	~~1.450~~	~~500~~	~~1000~~
	~~Benzo (k) fluoranthane~~	~~1.450~~	~~56~~	~~110~~
	~~Chrysene~~	~~1.20~~	~~56~~	~~110~~
	~~Dibenz (a,h) anthracene~~	~~0.796~~	~~0.56~~	~~1.1~~
	~~Fluoranthene~~	~~0.82~~	~~500~~	~~1000~~
	~~Indeno(1,2,3-cd)pyrene~~	~~1.97~~	~~5.6~~	~~11~~
	~~Phenanthrene~~	~~0.399~~	~~500~~	~~1000~~
	~~Pyrene~~	~~0.73~~	~~500~~	~~1000~~

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 2
Summary of Semi-Volatile Compounds Within Soil Boring Samples
Northand Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compounds	Concentration (ppm)		
~~SB018 (4-8')~~	~~Acenaphthene~~	~~0.506~~	~~500~~	~~1000~~
	~~Anthracene~~	~~0.544~~	~~500~~	~~1000~~
	~~Benzo (a) anthracene~~	~~2.34~~	~~5.6~~	~~11~~
	~~Benzo (a) pyrene~~	~~2.37~~	~~1.0~~	~~1.1~~
	~~Benzo (b) fluoranthene~~	~~2.94~~	~~5.6~~	~~11~~
	~~Benzo (g,h,i) perylene~~	~~1.780~~	~~500~~	~~1000~~
	~~Benzo (k) fluoranthane~~	~~1.480~~	~~56~~	~~110~~
	~~Chrysene~~	~~2.31~~	~~56~~	~~110~~
	~~Dibenz (a,h) anthracene~~	~~0.691~~	~~0.56~~	~~1.1~~
	~~Fluoranthene~~	~~4.05~~	~~500~~	~~1000~~
	~~Indeno(1,2,3-cd)pyrene~~	~~2.17~~	~~5.6~~	~~11~~
	~~Phenanthrene~~	~~1.440~~	~~500~~	~~1000~~
	~~Pyrene~~	~~3.15~~	~~500~~	~~1000~~
SB019 (0-4')	Benzo (a) anthracene	3.56	5.6	11
	Benzo (a) pyrene	4.48	1.0	1.1
	Benzo (b) fluoranthene	5.53	5.6	11
	Benzo (g,h,i) perylene	3.85	500	1000
	Benzo (k) fluoranthane	2.84	56	110
	Chrysene	4.47	56	110
	Fluoranthene	7.59	500	1000
	Indeno (1,2,3-cd) pyrene	4.43	NA	NA
	Phenanthrene	6.04	NA	NA
	Pyrene	8.18	NA	NA

NOTES:

Highlighted indicatates exceedence of Restricted Commercial and/or Industrial Use Guidance

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 3
Summary of RCRA Metals Within Soil Boring Samples
Northland Supplemental Project, Buffalo

Sample I.D.	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrialial Use Soil Cleanup Objectives (ppm)
	Compound	Concentration (ppm)		
~~SB006 (0-4')~~	~~Arsenic~~	~~40.8~~	~~16~~	~~16~~
	~~Barium~~	~~657~~	~~400~~	~~10000~~
	~~Cadmium~~	~~10.9~~	~~9.3~~	~~60~~
	~~Chromium~~	~~385~~	~~1,500~~	~~6,800~~
	~~Lead~~	~~117~~	~~1,000~~	~~3,900~~
	~~Selenium~~	~~39.3~~	~~1,500~~	~~6,800~~
	~~Silver~~	~~11.50~~	~~1,500~~	~~6,800~~
	~~Mercury~~	~~0.0274~~	~~2.8~~	~~5.7~~
SB009 (0-4')	Arsenic	27.2	16	16
	Barium	150	400	10000
	Cadmium	4.07	9.3	60
	Chromium	256	1,500	6,800
	Lead	174	1,000	3,900
	Selenium	16.0	1,500	6,800
	Silver	2.88	1,500	6,800
	Mercury	0.149	2.8	5.7
~~SB010 (4-8')~~	~~Arsenic~~	~~7.63~~	~~16~~	~~16~~
	~~Barium~~	~~127~~	~~400~~	~~10000~~
	~~Cadmium~~	~~0.589~~	~~9.3~~	~~60~~
	~~Chromium~~	~~31.3~~	~~1,500~~	~~6,800~~
	~~Lead~~	~~63.4~~	~~1,000~~	~~3,900~~
	~~Selenium~~	~~3.44~~	~~1,500~~	~~6,800~~
	~~Silver~~	~~1.40~~	~~1,500~~	~~6,800~~
	~~Mercury~~	~~0.049~~	~~2.8~~	~~5.7~~
~~SB015 (4-9')~~	~~Arsenic~~	~~8.53~~	~~16~~	~~16~~
	~~Barium~~	~~70.3~~	~~400~~	~~10000~~
	~~Cadmium~~	~~0.687~~	~~9.3~~	~~60~~
	~~Chromium~~	~~16.5~~	~~1,500~~	~~6,800~~
	~~Lead~~	~~65.3~~	~~1,000~~	~~3,900~~
	~~Selenium~~	~~5.03~~	~~1,500~~	~~6,800~~
	~~Silver~~	~~ND < 0.638~~	~~1,500~~	~~6,800~~
	~~Mercury~~	~~0.0238~~	~~2.8~~	~~5.7~~
~~SB016 (4-8')~~	~~Arsenic~~	~~3.89~~	~~16~~	~~16~~
	~~Barium~~	~~29.0~~	~~400~~	~~10000~~
	~~Cadmium~~	~~0.416~~	~~9.3~~	~~60~~
	~~Chromium~~	~~25.3~~	~~1,500~~	~~6,800~~
	~~Lead~~	~~40.5~~	~~1,000~~	~~3,900~~
	~~Selenium~~	~~2.79~~	~~1,500~~	~~6,800~~
	~~Silver~~	~~1.43~~	~~1,500~~	~~6,800~~
	~~Mercury~~	~~0.0400~~	~~2.8~~	~~5.7~~
~~SB018 (4-8')~~	~~Arsenic~~	~~12.80~~	~~16~~	~~16~~
	~~Barium~~	~~78.8~~	~~400~~	~~10000~~
	~~Cadmium~~	~~0.809~~	~~9.3~~	~~60~~
	~~Chromium~~	~~17.3~~	~~1,500~~	~~6,800~~
	~~Lead~~	~~227.0~~	~~1,000~~	~~3,900~~
	~~Selenium~~	~~2.91~~	~~1,500~~	~~6,800~~
	~~Silver~~	~~ND < 0.591~~	~~1,500~~	~~6,800~~
	~~Mercury~~	~~0.0579~~	~~2.8~~	~~5.7~~

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 3
Summary of RCRA Metals Within Soil Boring Samples
Northland Supplemental Project, Buffalo

Sample I.D.	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrialial Use Soil Cleanup Objectives (ppm)
	Compound	Concentration (ppm)		
SB019 (0-4')	Arsenic	29.6	16	16
	Barium	459	400	10000
	Cadmium	5.53	9.3	60
	Chromium	636	1,500	6,800
	Lead	375	1,000	3,900
	Selenium	8.58	1,500	6,800
	Silver	4.73	1,500	6,800
	Mercury	0.139	2.8	5.7

NOTES:

Highlighted indicates exceedence of Restricted Commercial and/or Industrial Use Soil Cleanup Guidance

Table 4
Summary of PCBs/Pesticides Within Soil Boring Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)
	Compound	Concentration (ppm)		
~~SB006 (0-4')~~	~~PCB-1254~~	~~0.551~~	~~1~~	~~25~~
	~~4,4-DDD~~	~~0.082~~	~~92~~	~~180~~
	~~4,4-DDE~~	~~0.031~~	~~62~~	~~120~~
	~~4,4-DDT~~	~~0.104~~	~~47~~	~~94~~
	~~beta-BHC~~	~~0.006 (P)~~	~~3~~	~~14~~
	~~Dieldrin~~	~~0.033 (P)~~	~~1.4~~	~~2.8~~
	~~Endosulfan II~~	~~0.005 (P)~~	~~NA~~	~~NA~~
	~~Endosulfan Sulfate~~	~~0.011 (P)~~	~~200~~	~~920~~
	~~Endrin~~	~~0.007 (P)~~	~~89~~	~~410~~
	~~Endrin Aldehyde~~	~~0.012 (P)~~	~~NA~~	~~NA~~
	~~Endrin Ketone~~	~~0.004 (P)~~	~~NA~~	~~NA~~
	~~Heptachlor Epoxide~~	~~0.047 (P)~~	~~NA~~	~~NA~~
	~~Methoxychlor~~	~~0.017 (P)~~	~~NA~~	~~NA~~
	~~trans-Chlordane~~	~~0.012 (P)~~	~~NA~~	~~NA~~
SB009 (0-4')	PCB-1254	13.6	1	25
	4,4-DDD	1.47	92	180
	4,4-DDE	0.634	62	120
	4,4-DDT	1.77	47	94
	Dieldrin	0.72 (P)	1.4	2.8
	Endosulfan Sulfate	0.199 (P)	200	920
	Endrin	0.215	89	410
	Endrin Aldehyde	0.247 (P)	NA	NA
	Endrin Ketone	0.250 (P)	NA	NA
	Heptachlor Epoxide	0.906	NA	NA
	Methoxychlor	0.279	NA	NA
	trans-Chlordane	0.398 (P)	NA	NA
~~SB010 (4-8')~~	~~PCB-1254~~	~~1.78~~	~~1~~	~~25~~
	~~4,4-DDD~~	~~0.212~~	~~92~~	~~180~~
	~~4,4-DDE~~	~~0.119~~	~~62~~	~~120~~
	~~4,4-DDT~~	~~0.280~~	~~47~~	~~94~~
	~~Dieldrin~~	~~0.090 (P)~~	~~1.4~~	~~2.8~~
	~~Endosulfan II~~	~~0.018 (P)~~	~~200~~	~~920~~
	~~Endosulfan Sulfate~~	~~0.024 (P)~~	~~200~~	~~920~~
	~~Endrin~~	~~0.023 (P)~~	~~89~~	~~410~~
	~~Endrin Aldehyde~~	~~0.025 (P)~~	~~NA~~	~~NA~~
	~~Heptachlor Epoxide~~	~~0.169~~	~~NA~~	~~NA~~
	~~Methoxychlor~~	~~0.049~~	~~NA~~	~~NA~~
	~~trans-Chlordane~~	~~0.048 (P)~~	~~NA~~	~~NA~~

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 4
Summary of PCBs/Pesticides Within Soil Boring Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)
	Compound	Concentration (ppm)		
~~SB015 (4-9')~~	~~NONE DETECTED~~	~~NA~~	~~NA~~	~~NA~~
~~SB016 (4-8')~~	~~beta-BHC~~	~~0.004~~	~~3~~	~~14~~
	~~Methoxychlor~~	~~0.004 (P)~~	~~NA~~	~~NA~~
~~SB018 (4-8')~~	~~4,4-DDD~~	~~0.005~~	~~92~~	~~180~~
	~~4,4-DDT~~	~~0.004 (P)~~	~~47~~	~~94~~
	~~Endrin Aldehyde~~	~~0.004~~	~~NA~~	~~NA~~
	~~Endrin Ketone~~	~~0.008 (P)~~	~~NA~~	~~NA~~
	~~Methoxychlor~~	~~0.011 (P)~~	~~NA~~	~~NA~~
SB019 (0-4')	PCB-1254	46.1	1	25
	4,4-DDD	1.79 (P)	92	180
	4,4-DDE	2.02 (P)	62	120
	4,4-DDT	5.53	47	94
	Dieldrin	0.497 (P)	1.4	2.8
	Endosulfan I	0.597 (P)	200	920
	Endosulfan II	0.486	200	920
	Endrin	3.63	89	410
	Heptachlor Epoxide	0.481	NA	NA
	Methoxychlor	1.16	NA	NA
	trans-Chlordane	1.60	NA	NA

Notes:
(P) >40% difference between primary and secondary analytical columns
Highlighted indicates exceedence of Restricted Commercial and/or Industrial Use Soil Cleanup Guidance

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 1
Summary of Volatile Organic Compounds Within Soil Boring Internal Samples
Northand Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compounds	Concentration (ppm)		
ASB5 (4-8')	1,2,4 - Trimethylbenzene	3.7	190	380
	1,3,5 - Trimethylbenzene	1.27	190	380
	Cyclohexane	0.99	NA	NA
	Isopropylbenzene	0.532	NA	NA
	m,p - Xylene	0.494	500	1000
	Methycyclohexane	4.3	NA	NA
	Napthalene	5.02	NA	NA
	n-Butylbenzene	2.03	NA	NA
	n - Propylbenzene	0.882	500	1000
	o-Xylene	0.404	NA	NA
	p-Isopropyltoluene	1.04	NA	NA
	sec - Butylbenzene	0.469	390	1000
ASB5 (8-10.2')	Acetone	0.136	500	1000
	Isopropylbenzene	0.028	NA	NA
	Methylcyclohexane	0.1	NA	NA
	n- Butylbenzene	0.088	NA	NA
	sec - Butylbenzene	0.034	500	1000
ASB8 (0-4')	NONE DETECTED	NA	NA	NA
	Methylcyclohexane	0.008	NA	NA
~~CSB3 (0-4')~~	~~Methylene chloride~~	~~0.034~~	~~500~~	~~1000~~
	~~Trichloroethene~~	~~0.011~~	~~200~~	~~400~~
~~DSB2 (0-4')~~	~~NONE DETECTED~~	~~NA~~	~~NA~~	~~NA~~

NOTES:

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 2
Summary of Semi-Volatile Compounds Within Soil Boring Internal Samples
Northand Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compounds	Concentration (ppm)		
ASB5 (4-8')	2-Methylnapthalene	37.7	NA	NA
	Acenaphthene	4.92	500	1000
	Anthracene	4.96	500	1000
	Benzo (a) anthracene	5.18	5.6	11
	Benzo (a) pyrene	9.21	1.0	1.1
	Benzo (b) fluoranthene	8.41	5.6	11.0
	Benzo (g,h,i) perylene	5.70	500	1000
	Benzo (k) fluoranthene	4.33	56	110
	Chrysene	6.37	56	110
	Dibenzofuran	3.40	NA	NA
	Fluoranthene	7.40	500	1000
	Fluorene	5.35	500	1000
	Indeno(1,2,3-cd)pyrene	8.74	5.6	11.0
	Naphthalene	4.65	500	1000
	N-Nitrosodiphenylamine	3.62	NA	NA
	Phenanthrene	23.2	500	1000
	Pyrene	10.7	500	1000
ASB5 (8-10.2)	Phenanthrene	0.635	500	1000
ASB8 (0-4')	Bis (2-ethylhexyl) phthalate	0.559	NA	NA
	Fluoranthene	0.778	500	1000
	Phenanthrene	0.596	500	1000
	Pyrene	0.57	500	1000

Table 3
Summary of RCRA Metals Within Soil Boring Internal Samples
Northland Supplemental Project, Buffalo

Sample I.D.	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compound	Concentration (ppm)		
ASB5 (4-8')	Arsenic	4.48	16	16
	Barium	24.5	400	10000
	Chromium	5.02	1,500	6,800
	Lead	10.4	1,000	3,900
	Selenium	0.642	1,500	6,800
	Mercury	0.0204	2.8	5.7
ASB5 (8-10.2')	Arsenic	4.72	16	16
	Barium	128	400	10000
	Cadmium	0.449	9.3	60
	Chromium	24.3	1,500	6,800
	Lead	14.9	1,000	3,900
	Silver	1.42	1,500	6,800
	Mercury	0.028	2.8	5.7
ASB8 (0-4')	Arsenic	103	16	16
	Barium	137	400	10000
	Cadmium	16.6	9.3	60
	Chromium	99.8	1,500	6,800
	Lead	9780	1,000	3,900
	Selenium	19.8	1,500	6,800
	Mercury	5.31	2.8	5.7
~~CSB3 (0-4')~~	~~Arsenic~~	~~12.1~~	~~16~~	~~16~~
	~~Barium~~	~~92.3~~	~~400~~	~~10000~~
	~~Cadmium~~	~~0.579~~	~~9.3~~	~~60~~
	~~Chromium~~	~~28.2~~	~~1,500~~	~~6,800~~
	~~Lead~~	~~75.6~~	~~1,000~~	~~3,900~~
	~~Selenium~~	~~2.40~~	~~1,500~~	~~6,800~~
	~~Silver~~	~~1.15~~	~~1,500~~	~~6,800~~
	~~Mercury~~	~~0.237~~	~~2.8~~	~~5.7~~
~~DSB2 (0-4')~~	~~Arsenic~~	~~12.7~~	~~16~~	~~16~~
	~~Barium~~	~~69.9~~	~~400~~	~~10000~~
	~~Cadmium~~	~~1.33~~	~~9.3~~	~~60~~
	~~Chromium~~	~~67.5~~	~~1,500~~	~~6,800~~
	~~Lead~~	~~193.0~~	~~1,000~~	~~3,900~~
	~~Selenium~~	~~3.17~~	~~1,500~~	~~6,800~~
	~~Silver~~	~~4.53~~	~~1,500~~	~~6,800~~
	~~Mercury~~	~~0.139~~	~~2.8~~	~~5.7~~

NOTES:

Highlighted indicates exceedence of Restricted Commercial Use Soil Cleanup Guidance

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 4
Summary of PCBs/Pesticides Within Soil Boring Internal Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compound	Concentration (ppm)		
ASB5 (4-8')	4,4-DDD	0.009	92	180
	Aldrin	0.014 (P)	0.68	1.4
	cis-Chlordane	0.004 (P)	NA	NA
	Endosulfan I	0.003 (P)	200	920
	Endosulfan Sulfate	0.004 (P)	200	920
	Endrin Ketone	0.009	NA	NA
	Heptachlor Epoxide	0.011	NA	NA
	Methoxychlor	0.01 (P)	NA	NA
	trans-Chlordane	0.01 (P)	NA	NA
ASB5 (8-10.2')	NONE DETECTED	NA	NA	NA
ASB8 (0-4')	PCB-1254	0.126	1	25
	4,4-DDE	0.004 (P)	62	120
	4,4-DDT	0.018 (P)	47	94
	Endosulfan Sulfate	0.004	NA	NA
	Heptachlor Epoxide	0.007	NA	NA
	Methoxychlor	0.009 (P)	NA	NA
~~CSB3 (0-4')~~	~~PCB-1254~~	~~0.034~~	~~1~~	~~25~~
	~~alpha-BHC~~	~~0.003~~	~~3.4~~	~~6.8~~
	~~beta-BHC~~	~~0.007 (P)~~	~~3~~	~~14~~
	~~cis-Chlordane~~	~~0.006~~	~~NA~~	~~NA~~
	~~Methoxychlor~~	~~0.023 (P)~~	~~NA~~	~~NA~~
~~DSB2 (0-4')~~	~~beta-BHC~~	~~0.015~~	~~3~~	~~14~~
	~~cis-Chlordane~~	~~0.010~~	~~NA~~	~~NA~~
	~~Endosulfan Sulfate~~	~~0.012 (P)~~	~~200~~	~~200~~
	~~Methoxychlor~~	~~0.02 (P)~~	~~NA~~	~~NA~~

Notes:
(P) >40% difference between primary and secondary analytical columns

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 1
Summary of Volatile Organic Compounds Within Pits/Sumps Liquid Samples
Northand Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected	
	Compounds	Concentration (ppm)
AP1-L	NON-DETECTED	ND<9.71
AP2-L	4-Methyl-2-pentanone	0.075
	Acetone	0.648
	m,p-Xylene	0.010
AP3-L	NON-DETECTED	ND<9.80
AP4-L	NON-DETECTED	ND<0.02
AP5-L	4-Methyl-2-pentanone	0.012
AP6-L	NON-DETECTED	ND<0.02
AP7-L	NON-DETECTED	ND<9.90
AP8-L	Acetone	0.065
AP9-L	NON-DETECTED	ND<0.02
AP10-L	1,4-Dichlorobenzene	0.004
AP11-L	4-Methyl-2-pentanone	2.58
	Acetone	11.7
	Ethylbenzene	0.719
	m,p-Xylene	3.18
	o-Xylene	1.11
AP13-L	Acetone	0.016
AP14-L	NON-DETECTED	ND<0.02
AP15-L	Acetone	7.49
AP17-L	NON-DETECTED	ND<0.091
AP18-L	NON-DETECTED	ND<18.8
AP19-L	NON-DETECTED	ND<9.52
ASB-L	NON-DETECTED	ND<9.71
AS2-L	NON-DETECTED	ND<0.02
AWLTF	NON-DETECTED	ND<9.71
~~CP1-L~~	~~NON-DETECTED~~	~~ND<0.01~~
~~CP2-L~~	~~NON-DETECTED~~	~~ND<0.01~~
~~CS1-L~~	~~NON-DETECTED~~	~~ND<0.02~~
~~DP1-L~~	~~Tetrachloroethene~~	~~0.0043~~
~~DP2-L~~	~~Acetone~~	~~0.168~~

NOTES:
Non-detected (ND)

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 2
Summary of Semi-Volatile Compounds Within Pits/Sumps Liquid Samples
Northand Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected	
	Compounds	**Concentration (ppm)**
AP4-L	NON-DETECTED	ND<0.2
AP5-L	NON-DETECTED	ND<0.1
AP6-L	Benzo (a) anthracene	0.017
	Benzo (b) fluoranthene	0.012
	Chrysene	0.013
	Fluoranthene	0.061
	Pyrene	0.06
AP8-L	Anthracene	0.012
	Pyrene	0.012
AP9-L	NON-DETECTED	ND<0.02
AP10-L	NON-DETECTED	ND<0.02
AP11-L	2,4-Dimethylphenol	0.025
	3&4-Methylphenol	0.028
	Naphthalene	0.012
AP13-L	Fluoranthene	0.025
	Pyrene	0.014
AP14-L	NON-DETECTED	ND<0.02
AS2-L	NON-DETECTED	ND<0.5
~~CP1-L~~	~~NON-DETECTED~~	~~ND<0.02~~
~~CP2-L~~	~~NON-DETECTED~~	~~ND<0.02~~
~~CS1-L~~	~~NON-DETECTED~~	~~ND<0.02~~
~~DP1-L~~	~~NON-DETECTED~~	~~ND<0.02~~
~~DP2-L~~	~~NON-DETECTED~~	~~ND<0.02~~

NOTES:
Non-detected (ND)
(ppm) parts per million

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 3
Summary of RCRA Metals Within Pits/Sumps Liquid Samples
Northland Supplemental Project, Buffalo

Sample I.D.	Compounds Detected	
	Compound	Concentration (ppm)
AP1-L	NON-DETECTED	ND<5.0
AP2-L	Barium	19.9
	Cadmium	0.758
	Chromium	7.38
	Lead	8.87
AP3-L	NON-DETECTED	ND<4.55
AP4-L	Lead	0.06
AP5-L	Chromium	0.05
	Lead	0.02
	Selenium	0.025
	Mercury	0.0005
AP6-L	Arsenic	0.006
	Chromium	0.022
	Selenium	0.007
AP7-L	Barium	7.19
	Chromium	0.757
	Lead	1.81
AP8-L	Chromium	0.023
	Lead	0.04
AP9-L	Barium	0.112
	Lead	0.006
AP10-L	Chromium	0.048
AP11-L	Barium	0.07
	Chromium	0.058
	Lead	0.030
	Selenium	0.009

Table 3
Summary of RCRA Metals Within Pits/Sumps Liquid Samples
Northland Supplemental Project, Buffalo

Sample I.D.	Compounds Detected	
	Compound	**Concentration (ppm)**
AP13-L	Arsenic	0.021
	Cadmium	0.136
	Chromium	0.027
	Lead	2.34
	Silver	0.006
	Mercury	0.0005
AP14-L	Barium	0.079
	Lead	0.013
A15-L	Barium	24.3
	Cadmium	1.05
	Chromium	7.09
	Lead	47.5
A17-L	Barium	71.6
	Cadmium	0.42
	Chromium	6.84
	Lead	37.8
A18-L	Barium	31.0
	Cadmium	0.69
	Chromium	5.98
	Lead	30.1
A19-L	Barium	25.8
	Cadmium	4.41
	Chromium	5.22
	Lead	21.0

Table 3
Summary of RCRA Metals Within Pits/Sumps Liquid Samples
Northland Supplemental Project, Buffalo

Sample I.D.	Compounds Detected	
	Compound	Concentration (ppm)
ASB-L	Chromium	1.75
	Lead	1.03
AS2-L	Cadmium	0.04
	Chromium	0.35
	Lead	1.05
	Mercury	0.0009
AWLTF	Cadmium	1.69
	Chromium	1.13
	Lead	8.73
~~CP1-L~~	~~Chromium~~	~~0.010~~
	~~Lead~~	~~0.018~~
~~CP2-L~~	~~Chromium~~	~~0.042~~
	~~Selenium~~	~~0.008~~
~~CS1-L~~	~~NON-DETECTED~~	~~ND<0.001~~
~~DP1-L~~	~~Selenium~~	~~0.007~~
~~DP2-L~~	~~Selenium~~	~~0.008~~

NOTES:
Non-detected (ND)

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 4
Summary of PCBs Within Pits/Sumps Liquid Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected	
	Compound	Concentration (ppm)
AP1-L	NON-DETECTED	ND<0.962
AP2-L	NON-DETECTED	ND<0.822
ASB-L	NON-DETECTED	ND<0.952
AS2-L	PCB-1254	0.0025
AP3-L	PCB-1254	0.0021
AP4-L	NON-DETECTED	ND<0.001
AP5-L	NON-DETECTED	ND<0.001
AP6-L	NON-DETECTED	ND<0.001
AP7-L	NON-DETECTED	ND<0.001
AP8-L	NON-DETECTED	ND<0.001
AP9-L	PCB-1254	0.002
AP10-L	NON-DETECTED	ND<0.001
AP11-L	NON-DETECTED	ND<0.001
AP13-L	NON-DETECTED	ND<0.001
AP14-L	NON-DETECTED	ND<0.001
AP15-L	NON-DETECTED	ND<0.001
AP17-L	NON-DETECTED	ND<0.001
AP18-L	NON-DETECTED	ND<0.001
AP19-L	NON-DETECTED	ND<0.001
AWLTF	NON-DETECTED	ND<0.001
~~CP1-L~~	~~NON-DETECTED~~	~~ND<0.001~~
~~CP2-L~~	~~NON-DETECTED~~	~~ND<0.001~~
~~CS1-L~~	~~NON-DETECTED~~	~~ND<0.001~~
~~DP1-L~~	~~NON-DETECTED~~	~~ND<0.001~~
~~DP2-L~~	~~NON-DETECTED~~	~~ND<0.001~~

Notes:

Non-detected (ND)

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

Table 2
Summary of Semi-Volatile Compounds Within Pits/Flooring/Drain Solid Samples
Northand Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected	
	Compounds	**Concentration (ppm)**
AP3-S	Acenaphthene	0.305
	Bis (2-ethlyhexyl) phthalate	0.444
	Dibenzofuran	0.524
	Fluoranthene	0.858
	Phenanthrene	1.46
	Pyrene	0.615
AP16-S	Benzo (a) anthracene	2.46
	Benzo (a) pyrene	2.03
	Benzo (b) fluoranthene	3.63
	Benzo (g,h,i) perylene	1.61
	Chrysene	3.24
	Fluoranthene	9.05
	Indeno (1,2,3-cd) pyrene	1.95
	Phenanthrene	8.59
	Pyrene	5.27
AWFloor (Wood)	Benzo (a) anthracene	498
	Benzo (a) pyrene	357
	Benzo (b) fluoranthene	416
	Benzo (k) fluoranthene	323
	Chrysene	555
	Fluoranthene	1510
	Indeno (1,2,3-cd) pyrene	316
	Phenanthrene	1220
	Pyrene	1100

Table 3
Summary of RCRA Metals Within Pits/Flooring/Drain Solid Samples
Northland Supplemental Project, Buffalo

Sample I.D.	Compounds Detected	
	Compound	**Concentration (ppm)**
AP3-S	Arsenic	10.3
	Barium	19.9
	Cadmium	0.682
	Chromium	4.81
	Lead	18.3
	Selenium	3.1
AP16-S	Arsenic	82.5
	Barium	865
	Cadmium	24.6
	Chromium	1310
	Lead	77.1
	Selenium	29.1
	Mercury	0.0890
AWFloor (Wood)	Arsenic	1.95
	Barium	71.2
	Cadmium	1.39
	Chromium	30.3
	Lead	68.4
	Selenium	1.2
	Silver	0.931
	Mercury	0.0102

Table 4
Summary of PCBs/Pesticides Within Pits/Flooring/Drain Solid Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected	
	Compound	Concentration (ppm)
AWFloor (Wood)	PCB-1254	0.59
~~CWFloor (Wood)~~	~~PCB-1254~~	~~1.42~~
~~CFS1 (Sand)~~	~~NON-DETECTED~~	~~ND<0.452~~
~~DSD1 (Sediment Drains)~~	~~NON-DETECTED~~	~~ND<0.0389~~
	~~4,4-DDD~~	~~0.050 (P)~~
	~~4,4-DDE~~	~~0.029 (P)~~
	~~4,4-DDT~~	~~0.108~~
	~~alpha-BHC~~	~~0.011 (P)~~
	~~cis-Chlordane~~	~~0.004 (P)~~
	~~delta-BHC~~	~~0.005 (P)~~
	~~Dieldrin~~	~~0.004 (P)~~
	~~Endosulfan II~~	~~0.008 (P)~~
	~~Endosulfin Sulfate~~	~~0.009~~
	~~Endrin Aldehyde~~	~~0.006 (P)~~
	~~Endrin Ketone~~	~~0.013~~
	~~gamma-BHC (Lindane)~~	~~0.005 (P)~~
	~~Methoxychlor~~	~~0.110 (P)~~
	~~trans-Chlordane~~	~~0.013~~

Notes:
Non-detected (ND)
(P) >40% difference between primary and secondary analytical columns

Strike-Outs added by LiRo to indicate that sample was not collected at 683 Northland

FISHERASSOCIATES

BORING LOG

Project Number:	143016	Test Boring Number:	SB008
Project Name:	Empire State Development	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	May 7, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
1	1, 4.0 Feet	Concrete Gravel 6" Yellowish Red, 5YR 4/6, Fill, sand & clay, med. Stiff, dry/moist	0.5 PPM
2			
3			
4			
5	2, 3.5 Feet	Yellowish Red, 5YR 4/6, Fill, sand & clay, very hard, dry/moist	0.1 PPM
6			
7			
8		Light Brown 10YR 8/3, F-C Silt, some F-C sand, trace cobbles, moist, loose	
9		Bottom of Boring = Refusal 7.8 feet BGS	
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	143016	Test Boring Number:	SB009
Project Name:	Empire State Development	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	May 7, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
1	1, 1.5 Feet	Concrete Gravel 6" Dark Gray N3, Fill, soft, saturated, petroleum like odor	572 PPM
2			
3			
4			
5	2, 2.0 Feet	Dark Gray N3, Fill, soft, saturated, petroleum like odor, wood debris at bottom	131 PPM
6			
7			
8		Bottom of Boring = Refusal 7.2 feet BGS	
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	143016	Test Boring Number:	SB011
Project Name:	Empire State Development	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	May 8, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
1	1, 3.0 Feet	Grass Topsoil 3" Yellowish Red 5YR 4/6, Fill, loose, dry/damp	0.1 PPM
2			
3			
4			
5	2, 3.0 Feet	Brown 10YR 5/3, Fill, gravel pack around former tank area, soft, dry/moist	0.3 PPM
6			
7			
8			
9		Bottom of Boring = Refusal 8.1 feet BGS	
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	143016	Test Boring Number:	SB019
Project Name:	Empire State Development	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 18, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
1	1, 3.0 Feet	Grass Topsoil 3" Yellowish Red 5YR 4/6, Fill, Loose, moist	3.2 PPM
2			
3			
4			
5	2, 2.5 Feet	Dark Gray N3, Fill, loose, moist	10.5 PPM
6			
7		6.5' Bottom of Boring Refusal	
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	154034	Test Boring Number:	ASB-1
Project Name:	Buffalo Urban Development Corp.	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 18, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
		Concrete Floor 4"	
1	1, 4.0 Feet	Yellowish Red 5YR 4/6, Fill, Medium stiff, moist	1.6 PPM
2			
3			
4	2, 3 inches	4.7' Bottom of Boring Refusal	2.4 PPM
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	154034	Test Boring Number:	ASB-2
Project Name:	Buffalo Urban Development Corp.	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 18, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
		Concrete Floor 8"	
1	1, 4.0 Feet	Yellowish Red 5YR 4/6, Fill, f-c silt and sand, some f-c gravel, interbedded w/cobbles,Medium stiff, moist	1.7 PPM
2			
3			
4			
	2, 2 inches	4.6' Bottom of Boring Refusal	2.2 PPM
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	154034	Test Boring Number:	ASB-3
Project Name:	Buffalo Urban Development Corp.	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 18, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
	1, 0.0 Feet	Concrete Floor 12+" (two locations) No Boring	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	154034	Test Boring Number:	ASB-4
Project Name:	Buffalo Urban Development Corp.	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 18, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
		Brick Floor 3"	
	1, 4.0 Feet	Yellowish Red 5YR 4/6, Fill, ,Medium stiff, moist	2.7 PPM
1			
2			
3			
4			
	2, 1.5 Feet		3.6 PPM
5			
6			
7		6.4' Bottom of Boring Refusal	
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	154034	Test Boring Number:	ASB-5
Project Name:	Buffalo Urban Development Corp.	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 18, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
1	1,3.0 Feet	Brick Floor 3" Yellowish Red 5YR 4/6, Fill, ,Soft, moist	98 PPM
2			
3			
4	2,3.5 Feet		282 PPM
5			
6			
7			
8		Black (Dark Gray N3), Fill	
9	3,2.0 Feet	Brown 10 YR 5/3, Fill, Med Stiff, moist	51 PPM
10			
11		10.2' Bottom of Boring Refusal	
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	154034	Test Boring Number:	ASB-6
Project Name:	Buffalo Urban Development Corp.	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 18, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
1	1,3.0 Feet	Concrete 6" Yellowish Red 5YR 4/6, Fill, ,Soft, moist	3.4 PPM
2			
3			
4		3.8' Bottom of Boring Refusal	
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	154034	Test Boring Number:	ASB-7
Project Name:	Buffalo Urban Development Corp.	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 18, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
		Concrete 5"	
	1, 2.0 Feet	Yellowish Red 5YR 4/6, Fill, ,Soft, moist	2.1 PPM
1			
2			
3			
4	2, 2.0 Feet		2.1 PPM
5			
6			
7			
8		7.2' Bottom of Boring Refusal	
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	154034	Test Boring Number:	ASB-8
Project Name:	Buffalo Urban Development Corp.	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 18, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
1	1, 2.5 Feet	Wood/Concrete 12" Brown 10YR 5/3, Fill, ,loose, dry/moist	5.1 PPM
2			
3		Yellowish Red 5 YR 4/6, Fill, loose, moist	
		Reddish Brown 10 YR 3/6, Fill, loose, moist	
4	2, 3.0 Feet	Yellowish Red 5 YR 4/6, Fill, med stiff, moist	2.2 PPM
5			
6			
7			
8		7.10' Bottom of Boring Refusal	
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	154034	Test Boring Number:	ASB-9
Project Name:	Buffalo Urban Development Corp.	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 18, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
1	1, 3 Feet	Wood/Concrete 10" Brownish Yellow to Yellowish Red 5YR 4/6, soft, moist	4.5 PPM
2			
3			
4	2, 4 Feet	Yellowish Red 5 YR 4/6, Fill, med stiff, moist	1.9 PPM
5			
6			
7			
8		7.10' Bottom of Boring Refusal	
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	154034	Test Boring Number:	ASB-10
Project Name:	Buffalo Urban Development Corp.	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 18, 2015
Operator:	Doug	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
1	1, 3 Feet	Wood/Concrete 8" Brown 10YR 5/3, loose, dry	1.9 PPM
2			
3			
4		3.5' Bottom of Boring Refusal	
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHERASSOCIATES

BORING LOG

Project Number:	154034	Test Boring Number:	BSB-1
Project Name:	Buffalo Urban Development Corp.	Surface Elevation:	NA
Project Location:	631,683,741,777 Northland Avenue	Location:	NA
Contractor:	Nature's Way Environmental	Date:	June 19, 2015
Operator:	Nathan	Weather:	Sunny 80 Degrees F
Equipment:	Simco - Earthprobe 200	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Num. Recovery	Soil Description	PID Reading (ppm)
1	1, 4 Feet	Concrete 4" Yellowish Red 5YR 4/6, Fill, med stiff, moist	4.5 PPM
2			
3		Yellowish Red 5YR 4/6, f-c Sand, loose, dry/moist	
4	2, 2.5 Feet	Yellowish Red 5YR 4/6, Till, med stiff, moist	1.5 PPM
5			
6			
7			
8		7.2' Bottom of Boring Refusal	
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

ATTACHMENT 2

Fisher Supplemental Phase II ESA

Supplemental Phase II Environmental Site Assessment

683Northland Avenue

City of Buffalo, Erie County, New York

Prepared For:
Nordell II, LLC
95 Perry Street, Suite 404
Buffalo, NY 14203

January 2016

Prepared By:

FISHER ASSOCIATES

Table of Contents

EXECUTIVE SUMMARY

This report has been prepared to summarize additional field activities conducted at the property located at 683 Northland Avenue, City of Buffalo, Erie County, New York (subject property). The work was completed on behalf of NorDell II, LLC (NorDell II).

The subject property is currently being considered by NorDell II for new uses. Limited site investigations were previously conducted at two (2) of the subject properties. A limited Phase II Environmental Site Assessment (ESA) was conducted at 644 and 683 Northland Avenue in June 2005 by Leader Professional Services, Inc. which identified residual contamination in subsurface soils and groundwater. Fisher Associates recommended a Phase II ESA after it completed a Phase I ESA in June 2015. The Phase I ESA identified recognized environmental conditions (RECs) based on a number of observations including, but not limited to; on-site storage tanks and containers, waste storage, and the historic use of the subject properties and adjacent properties. After the initial Phase II ESA was completed, additional investigative work was requested to further characterize the RECs on this property.

Due to the RECs identified in the Phase I ESA, historic use of the subject properties, the results of the Phase II ESA conducted in 2005, and initial Phase II ESA investigation work conducted by Fisher Associates, it was determined that supplemental Phase II ESA work would be conducted to better assist with remedial activities prior to building/site reuse.

The soils recovered from soil borings were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), Resource Conservation and Recovery Act (RCRA) metals, and polychlorinated biphenyls (PCBs). Solid and liquid samples from the existing subfloor pits were collected to identify the type and quantity of material still present. Solid samples of the wood flooring that accounts for much of the floor material throughout Building A were also collected to determine potential disposal options. These solid and wood samples were analyzed using a Toxicity Characteristic Leaching Procedure (TCLP) for VOCs, SVOCs, RCRA metals, Herbicides, and Pesticides. These samples were also analyzed for Total Cyanide. Liquid pit samples were analyzed for SVOCs, RCRA metals, and PCBs.

Soils

The soil boring locations did not contain concentrations of VOCs or SVOCs above the NYSDEC's *Part 375-6 Remedial Program Soil Cleanup Levels (375-6.4) Soil Cleanup Objectives* (SCOs) or were below the laboratory method detection limit (MDL). RCRA metals were detected within the soil borings for Arsenic, Barium, Cadmium, Lead, and Mercury. PCBs (specifically PCB-1254) were detected in two (2) of the borings, one of which was over the SCO for Commercial use but under the Industrial SCO. Based on the results of the sampling and laboratory analysis, with the exception of the area where PCBs were detected, the soils can remain in place for use as a commercial property. The PCBs can be removed to meet the Commercial SCO for the site.

Solid Wood and Pit Samples

Solid wood and pit samples were analyzed for VOCs, SVOCs, RCRA metals, Herbicides, and Pesticides using TCLP (characterized for corrosivity via USEPA Method 9045D, Flash Point via USEPA Method 1010A, Cyanide Reactivity via USEPA Method 7.3.3.2, Sulfide Reactivity via USEPA Method 7.3.4.2, and Total Cyanide via USEPA Method 9014). These samples were also analyzed for Total Cyanide.

All of the solid wood and pit samples were below TCLP regulatory limits. The VOC concentrations were below laboratory MDLs for both solid wood and pit samples. SVOCs were detected in all but one (1) of the solid wood samples, but not in the solid pit samples. RCRA metals were detected in all solid wood and pit samples and included Barium, Chromium, Cadmium, Lead, and Cyanide depending upon the specific sample. Pesticides or Herbicides were below laboratory MDL for solid wood and pit samples.

Based on the laboratory results, the solid wood and pit samples are non-hazardous solid waste as they do not exceed TCLP regulatory limits.

Liquid Pit Samples

The liquid pit samples contained the SVOC phenanthrene in two (2) of the three (3) samples collected. RCRA metals were detected in all liquid samples and contained Arsenic, Barium, Chromium, Lead and Mercury, depending upon the specific sample. PCB concentrations were below laboratory MDLs for all liquid pit samples.

Recommendations

Based on the laboratory analytical results, PID data collected, and field observations, it is recommended that a soil management plan (SMP) be prepared and implemented for any on-site excavations or other intrusive work. Cleaning and removal of existing waste in pits and on pit walls and wood flooring will need to be conducted, and associated waste handled properly for disposal. Solid wood and pit samples may require additional sampling for landfill profile approval before disposal.

The liquid wastes that are contained within the former machinery pits will need to be collected and transported off-site to a disposal facility that treats liquid waste. Additional sampling may be required by the disposal facility.

1.0 INTRODUCTION

This report presents the results of a Supplemental Phase II Environmental Site Assessment (ESA) conducted by Fisher Associates on behalf of NorDell II, LLC (NorDell II) for property located at 683 Northland Avenue in the City of Buffalo (subject property).

1.1 Site Background

The subject property is located along the south side of Northland Avenue, in the City of Buffalo, New York. The property is a former industrial facility that utilized cutting oils, lube oils, grease, other petroleum products, and degreasing agents.

Review of historic Sanborn Maps acquired by Fisher Associates for the Phase I ESA dated June 2015 indicates that the subject property included industrial operations beginning in the early 1900s. Niagara Machine & Tool Works operated on the subject properties as early as 1917, and Otis Elevator (later called Buffalo Stainless Casting Corporation) operated in the mid-1950s. In 1986, Niagara Machine & Tool Works still existed with Curtiss Wright Corporation-Metal Processing Division located east of the subject properties.

1.2 Purpose and Scope

The purpose of the Supplemental Phase II ESA was to further determine the potential for encountering contaminated soils and more accurately characterize surface and subsurface facility environmental conditions prior to remedial activities and building/site reuse. The Supplemental Phase II ESA included a total of six (6) soil borings, as well as analytical laboratory testing on soils, liquids/solids contained in subfloor pits, and testing of wood flooring. A separate Hazardous Materials Assessment for asbestos, lead, and PCBs was also conducted and a report prepred under separate cover.

2.0 FIELD INVESTIGATIONS

2.1 Soil Borings

During November 2015, representatives from Fisher Associates and Nature's Way Environmental Consultants & Contractors, Inc. (Nature's Way), advanced a total of six (6) soil borings, using truck-mounted direct push soil sampling technology at locations within the subject properties as shown in Figure 1, Appendix A.

The six (6) soil test borings were pneumatically driven to refusal conditions (i.e. bedrock), which was assumed to be 10 to 18 feet below ground surface (bgs). During drilling, the soils recovered from the borings were monitored at 4.0 foot (ft.) intervals using a RAE Systems MiniRAE 3000 photoionization detector (PID) equipped with a 10.7 eV lamp. The soil samples were scanned for the presence of organic compounds, and the subsurface conditions were documented during the investigation. Copies of the soil boring logs prepared by Fisher Associates are contained in Appendix B.

Representative soil samples were taken from the borings which produced the highest PID reading above background (at a depth where the highest PID reading was obtained during monitoring). Samples were collected from soil borings at the following locations: ASB11 (4-4.5'), ASB12 (4-

4.5'), ASB13 (8-8.5'), ASB14 (8-10'), ASB15 (0-4'), and ASB16 (4-8'). See Figure 2 in Appendix A for soil sampling locations. The results of the soil sample headspace scanning are shown on the soil boring logs contained in Appendix B.

Once collected, the soil samples were placed in laboratory grade glass jars and submitted under standard chain-of-custody protocol to Paradigm Environmental Services (Paradigm), a New York State Department of Health (NYSDOH)-approved laboratory for analysis. The samples were analyzed for TCL VOCs via United States Environmental Protection Agency (USEPA) Methods 8260C and 5035A, SVOCs via USEPA Method 8270D and 3550C, RCRA Metals via USEPA Methods 6010C and 3050, Mercury via USEPA Method 7471B, PCBs via USEPA Methods 8082A and 3550C. The analytical laboratory summarized tables (Tables 1-4) are provided in Appendix C and the analytical laboratory report and chain-of-custody forms are contained in Appendix D.

2.2 Facility Environmental Waste Identification

Within the existing on-site buildings, several sampling points were identified to properly characterize potential hazardous materials stored or contained on the subject property for removal and off-site disposal. Several industrial pits associated with machinery previously housed within the on-site building were identified, and samples of liquid and solid materials contained in those pits were sampled. A total of four (4) solid composite wood block floor and two (2) solid composite material pit samples were collected. In addition, three (3) composite liquid material pit samples were collected.

Wood block floors were sampled within Building A at locations designated: Area A, Area B, Area C, and Area D. Composite samples were collected within these designated areas in Building A as shown in Figure 2, Appendix A. Samples were placed in laboratory grade glass jars and submitted under standard chain-of-custody protocol to Paradigm for analysis. The samples were analyzed using a Toxicity Characteristic Leaching Procedure (TCLP) for VOCs via USEPA Method 8260C and 1311/3510C, SVOCs via USEPA Method 8270D and 1311/3510C, RCRA Metals via USEPA Methods 6010C and 1311/3005, Herbicides via USEPA Method 8151A and 1311, and Pesticides via USEPA Method 8081B and 1311/3510C.

The pits sampled in Building A were former locations of industrial machinery that also had residual petroleum-like liquid and surface water contained in them. In addition to the liquids, leftover solid waste materials were placed within some of the pits. The following representative solid composite samples were collected from the identified pit locations inside Building A. The composite sample identification is shown with the individual discreet sample identifiers listed in parenthesis: PC1 (P3, P16, P18), and PC2 (P2, P6, P10, P11, P12, P13, P14). Liquid composite samples were collected from the following identified pit locations inside Building A: PC1 (P2, P3, P6, P7, P8, P9, P10, P11), PC2 (P4, P5, P7), and PC3 (P13, P15). These sample locations are depicted in Figure 2, Appendix A.

The analytical laboratory summarized tables (Tables 5-8 and 12) are provided in Appendix C, and the analytical laboratory report and chain-of-custody forms are contained in Appendix D.

The liquid and solid samples collected from the pit locations were placed in laboratory grade glass jars and then submitted under standard chain-of-custody protocol to Paradigm for analysis. The solid

samples were analyzed using TCLP for VOCs, SVOCs, RCRA Metals, Herbicides, and Pesticides. In addition to the TCLP analyses, solid samples were also analyzed for Total Cyanide, corrosivity, reactivity (cyanide and sulfide), and flash point (see Table 12, Appendix C). Liquid samples were analyzed for SVOCs, RCRA Metals, and PCBs. The analytical laboratory summarized tables for the solid composite samples can be found in Tables 5-8 in Appendix C, and liquid composite results can be found in Tables 9-11 in Appendix C. Analytical laboratory report and chain-of-custody forms are provided in Appendix D for both solid and liquid composite samples.

3.0 INVESTIGATION AND ANALYTICAL TEST RESULTS

3.1 Soil Borings

Soil samples were collected within the on-site building footprint beneath the existing floor from borings at the following locations: ASB11 (4-4.5'), ASB12 (4-4.5'), ASB13 (8-8.5'), ASB14 (8-10'), ASB15 (0-4'), ASB16 (4-8'). Samples were analyzed by Paradigm for TCL VOCs, SVOCs, RCRA Metals, and PCBs. The analytical laboratory summarized tables (Table 1-4) are provided in Appendix C and the analytical laboratory report and chain-of-custody forms are contained in Appendix D.

The NYSDEC Department of Environmental Remediation (DER) publication *DER-10* contains cleanup guidelines for various types of existing or proposed land uses. The DER 10, Section 1.12 Use of Site guidelines, indicates that the subject properties would fall under restricted use commercial or industrial use criteria.

The laboratory analysis results were compared to the NYSDEC's *Part 375-6 Remedial Program Soil Cleanup Levels (375-6.4) Soil Cleanup Objectives* (SCOs) for Commercial and Industrial use. Soil boring analytical results showed that VOCs were detected in all but ASB11, which was below the laboratory MDL. However, VOCs detected in the other soil borings (ASB12-ASB16) were below restricted levels in the NYSDEC SCOs for Commercial and/or Industrial. SVOCs were detected at levels above the laboratory MDLs but below the NYSDEC SCOs for samples ASB12 and ASB14. The other samples collected from ASB11, ASB13, ASB15, and ASB16 were below the laboratory MDLs for SVOCs. RCRA Metals were detected at levels below the NYSDEC's SCOs for all samples collected. PCBs were detected at sample ASB12 above the NYSDEC SCOs Commercial Use limits but below the Industrial Use limits for PCB-1254. ASB14 also contained PCB-1254, but at levels below the NYSDEC SCOs.

Therefore, except for the areas where PCBs were encountered above the NYSDEC SCOs for restricted commercial use, the soils can remain in place if future building/site use are limited to commercial and/or industrial activities. Once the PCBs have been remediated, the entire site would qualify for restricted commercial use.

3.2 Facility Environmental Waste

Solid samples were also collected from pits and from wood flooring at the following locations: Area A, Area B, Area C, Area D, PC1, and PC2. Samples were collected and analyzed using a TCLP for VOCs, SVOCs, RCRA Metals, Herbicides, and Pesticides. Samples were also analyzed for Total

Cyanide. VOCs were below laboratory MDLs for all the samples (Table 5, Appendix C). SVOC compounds were detected at locations Area A, Area B, and Area C (Table 6, Appendix C). RCRA Metals were detected at all sample locations (Table 7, Appendix C) while Total Cyanide was detected at Area A, Area B, Area C, and PC2 (Table 7, Appendix C). No Pesticides or Herbicides were detected above laboratory MDLs at any of the wood flooring or solid pit sample locations (Table 8, Appendix C). The wood floor and solid pit samples that were characterized for corrosivity, Flash Point, Cyanide Reactivity, Sulfide Reactivity, and Total Cyanide did not exceed regulatory limits for those hazardous characteristic parameters (Table 12, Appendix C).

Liquid pit samples were collected from the following locations: PC1, PC2, and PC3. Samples were collected and analyzed for the presence of SVOCs, RCRA Metals, and PCBs. SVOCs were detected in PC1 and PC3 and results are shown in Table 9, Appendix C. RCRA Metals were also detected at PC1, PC2 and PC3 (Table 10, Appendix C). No PCBs were detected in samples PC1, PC2 or PC3 (Table 11, Appendix C).

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Subsurface Soils

The purpose of the supplemental subsurface investigation was to further determine the potential for encountering potential contaminated soils from on-site or off-site sources. To accomplish this, a total of six (6) soil borings were advanced to provide additional environmental data for the subject property. The soils recovered were monitored for the presence of VOCs on site, placed in laboratory grade containers, and analyzed by Paradigm for VOCs, SVOCs, RCRA metals, and PCBs.

In comparing the results to the NYSDEC's *Part 375-6 Remedial Program Soil Cleanup Levels (375-6.4) Soil Cleanup Objectives* (SCOs) for Commercial and Industrial use, the soil boring analytical results showed that VOCs were detected in all the soil samples except ASB11, which was below the laboratory MDL. However, VOCs detected in the other soil borings (ASB12-ASB16) were below restricted levels in the NYSDEC SCOs for Commercial and/or Industrial. SVOCs were detected at levels above the laboratory MDLs but below the NYSDEC SCOs for samples ASB12 and ASB14. The other samples collected from ASB11, ASB13, ASB15, and ASB16 were below the laboratory MDLs for SVOCs. RCRA Metals were detected at levels below the NYSDEC's SCOs for all samples collected. PCBs were detected at sample ASB12 above the NYSDEC SCOs Commercial Use limits but below the Industrial Use limits for PCB-1254. ASB14 also contained PCB-1254, but at levels below the NYSDEC SCOs.

Based on the laboratory results, PID data collected, and field observations, it is recommended that a soil management plan (SMP) be prepared and implemented for any on-site excavations or other intrusive work. In addition, field soil sampling to determine the localized horizontal and vertical extent of contamination surrounding ASB12 should also be performed to identify the areal extent to remediate. This area has elevated levels of PCBs, with noticeable petroleum staining and product. Any soils to be left in place on site should be evaluated to determine the depth to contamination encountered and the need for a sub-slab vapor extraction system or similar engineering controls.

4.2 Facility Environmental Waste

Solid waste samples were also collected in pits at the following locations: PC1 (P3, P16, P18), and PC2 (P2, P6, P10, P11, P12, P13, P14). Samples were collected and analyzed using TCLP for VOCs, SVOCs, RCRA Metals, Herbicides, and Pesticides. Samples were also analyzed for Total Cyanide. No VOCs were detected in any of the samples (Table 5, Appendix C). SVOCs were detected at locations Area A, Area B, Area C (Table 6, Appendix C). RCRA Metals were detected at all of the sample locations (Table 7, Appendix C). Total Cyanide was detected at all samples locations except Area D and PC1. No Pesticides or Herbicides were detected in any of the wood samples collected (Table 8, Appendix C). The wood floor and solid pit samples that were characterized for corrosivity, Flash Point, Cyanide Reactivity, Sulfide Reactivity, and Total Cyanide did not did exceed regulatory limits for those hazardous characteristic parameters (Table 12, Appendix C) and therefore can be disposed as non-hazardous solid waste.

Composite liquid pit samples were collected from the following locations: PC1 (P2, P3, P6, P7, P8, P9, P10, P11), PC2 (P4, P5, P7), and PC3 (P13, P15). Samples were collected and analyzed for the presence of SVOCs, RCRA Metals, and PCBs. SVOCs were detected in PC1 and PC2 and included in Table 9 in Appendix C. RCRA Metals were also detected at in all liquid samples collected (Table 10, Appendix C). No PCBs were detected in any of the composite samples collected (Table 11, Appendix C). The liquid wastes that are contained within the former machinery pits will need to be collected and transported off-site to a disposal facility that treats liquid waste. Additional sampling may be required by the disposal facility.

Cleaning and removal of existing waste in pits and on pit walls and wood flooring will need to be conducted and associated waste handled properly for disposal. Additional sampling may be required for landfill waste profile approval before disposal of any materials contained in these subfloor pits. This will be conducted by the contractor based on the requirements of the selected disposal facility.

APPENDIX A

PROJECT LOCATION MAPS

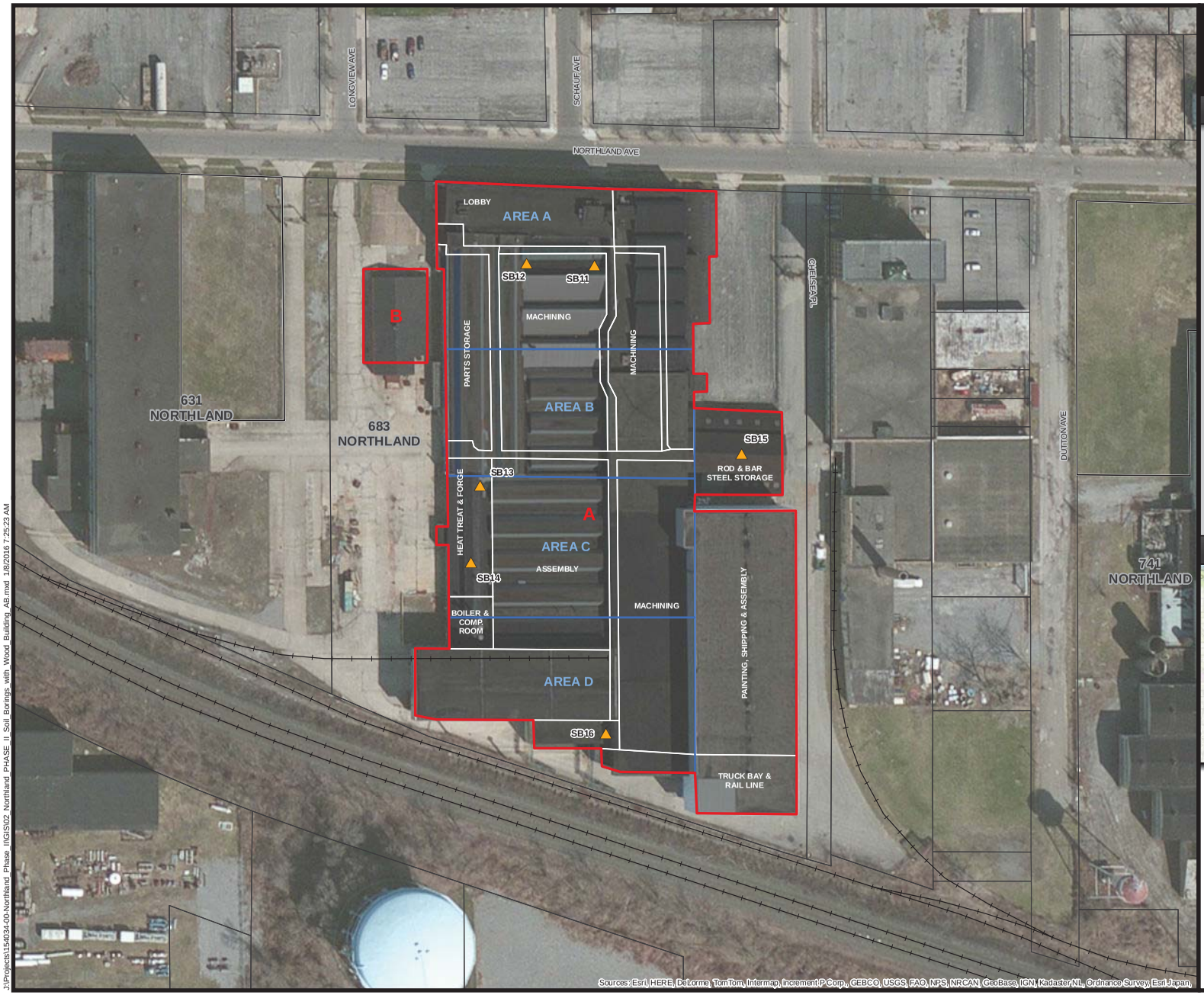


FIGURE 1
BUILDING A&B SOIL BORING LOCATIONS
NORTHLAND AVENUE PROPERTIES
683 NORTHLAND AVE, BUFFALO, NY 14211

LEGEND

- Soil Boring
- Railroad
- Parcel Boundary
- Buildings A & B
- Wood Composite Sample Area

NOTE: Composite wood samples were collected from Area A, B, C, D.

0 100 Feet

REGIONAL MAP

AUTHOR: AK
REVISION DATE: 1/8/2016 7:25:23 AM
Coordinate System: NAD 1983 StatePlane New York West FIPS 3103 Feet
Projection: Transverse Mercator
DATA SOURCES:
Aerials: ESRI World Imagery http://goto.arcgisonline.com/maps/World_Imagery
Roads: NYS ALIS 2013 http://www.nysgis.state.ny.us/

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J:\Projects\154034-00-Northland_Phase_II\GIS\02_Northland_PHASE_II_Soil_Borings_with_Wood_Building_AB.mxd 1/8/2016 7:25:23 AM

FIGURE 3
BUILDING A&B SURFACE LIQUIDS AND SOLIDS SAMPLE LOCATIONS NORTHLAND AVENUE PROPERTIES 683 NORTHLAND AVE, BUFFALO, NY 14211

LEGEND

Type

- Liquid & Solid Sample Location
- Solid Sample Location
- Liquid Sample Location

Sub Type

- PC1S
- PC2S
- PC1L
- PC2L
- PC3L
- PC1L & PC2L
- PC2S & PC1L
- PC2S & PC3L
- Railroad
- Parcel Boundary
- Site Buildings A & B

0 100 Feet

REGIONAL MAP

AUTHOR: AK
REVISION DATE: 1/8/2016 7:25:37 AM
Coordinate System: NAD 1983 StatePlane New York West FIPS 3103 Feet
Projection: Transverse Mercator
DATA SOURCES:
Aerials: ESRI World Imagery http://goto.arcgisonline.com/maps/World_Imagery
Roads: NYS ALIS 2013 http://www.nysgis.state.ny.us/

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APPENDIX B

SOIL BORING LOGS

FISHER ASSOCIATES

BORING LOG

Project Number:	153022	Test Boring Number:	ASB-11
Project Name:	Supplemental Phase II ESA	Surface Elevation:	NA
Project Location:	683 Northland Avenue	Location:	Refer to Site Plan
Contractor:	Nature's Way Environmental	Date:	November 24, 2015
Operator:	Jamal	Weather:	overcast, 32°F
Equipment:	Direct Push	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Number	Soil Description	PID Reading (ppm)
		4" Concrete Floor	
1			
2	3.8' Recovery	10 YR 5/4 Yellowish Brown, Till, Medium Stiff, Dry	0.3 ppm
3			
4	0.6" Recovery	10 YR 5/4 Yellowish Brown, Till, Medium Soft, Dry	0.6 ppm (Sampled)
5		Bottom of Boring, 4.5' Below Concrete Slab	
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHER ASSOCIATES

BORING LOG

Project Number:	153022	Test Boring Number:	ASB-12
Project Name:	Supplemental Phase II ESA	Surface Elevation:	NA
Project Location:	683 Northland Avenue	Location:	Refer to Site Plan
Contractor:	Nature's Way Environmental	Date:	November 24, 2015
Operator:	Jamal	Weather:	Overcast, 32°F
Equipment:	Direct Push	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Number	Soil Description	PID Reading (ppm)
1			
2	4.5'	Yellowish brown 10 YR 5/4, Till, Medium Soft, Dry/moist	0.5 ppm
3			
4	6"	Yellowish brown 10 YR 5/4, Till, Medium Soft, Moist	Sampled 4-4.5'
5		BOB 4.5' Below Concrete Slab Refusal	1.9 ppm
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHER ASSOCIATES

BORING LOG

Project Number:	153022	Test Boring Number:	ASB13
Project Name:	Supplemental Phase II ESA	Surface Elevation:	NA
Project Location:	683 Northland Ave	Location:	Refer to Site Plan
Contractor:	Nature's Way Environmental	Date:	November 24, 2015
Operator:	Jamal	Weather:	Overcast, 32°F
Equipment:	Direct Push	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Number	Soil Description	PID Reading (ppm)
	Recovery	Brick 4"	
1		Yellowish Red 5 YR 4/2, Fill, Medium Soft, Moist/Dry	
2	3.7'		3.5 ppm
3			
4			
5			
6		Black 4/2 Fill, Soft, Dry	20.4 ppm
7			
8		Yellowish Red 5 YR 4/2, Fill, Soft, Moist	54.3 ppm (Sampled)
9		Bottom of Boring 8.5' BGS	
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHER ASSOCIATES

BORING LOG

Project Number:	153022	Test Boring Number:	ASB14
Project Name:	Supplemental Phase II ESA	Surface Elevation:	NA
Project Location:	683 Northland Ave	Location:	Refer to Site Plan
Contractor:	Nature's Way Environmental	Date:	November 24, 2010
Operator:	Jamal	Weather:	Overcast, 32°F
Equipment:	Direct Push	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Number	Soil Description	PID Reading (ppm)
		Brick 4"	
1		Yellowish Red 5 YR 4/2, Fill, Medium Soft, Dry/Moist	
2	2.0'		2.6
3			
4			
5			
6	3.5	Brown/Black, Fill, Medium Soft, Moist (odor)	136.0 ppm
7			
8		Yellowish Red, 5 YR 4/2, Till/Fill, Medium Stiff, Moist/Wet	
9	2.0'		285.0 ppm (Sampled)
10		Bottom of Boring 10' BGS	
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHER ASSOCIATES

BORING LOG

Project Number:	153022	Test Boring Number:	ASB15
Project Name:	Supplemental Phase II ESA	Surface Elevation:	NA
Project Location:	683 Northland Ave	Location:	Refer to Site Plan
Contractor:	Nature's way Environmental	Date:	November 24, 2015
Operator:	Jamal	Weather:	Overcast, 35°F
Equipment:	Direct Push	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Number	Soil Description	PID Reading (ppm)
		Concrete 4"	
1		Yellowish Red 5 YR 4/2, Fill, Medium Soft, Dry/Moist	
2	3.7'		1.0 ppm (Sampled)
3			
4		Yellowish Red 5/yr 4/6, Till, Moist Soft	
5	2.0'		0.1 ppm
6			
		Bottom of Boring 6.1' BGS (Rock fragments)	
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

FISHER ASSOCIATES

BORING LOG

Project Number:	153022	Test Boring Number:	ASB16
Project Name:	Supplemental Phase II ESA	Surface Elevation:	NA
Project Location:	683 Northland Ave	Location:	Refer to Site Plan
Contractor:	Nature's Way Environmental	Date:	November 24, 2015
Operator:	Jamal	Weather:	Overcast, 35°F
Equipment:	Direct Push	Fisher Associates Rep.:	J. Moore

Depth (Feet)	Sample Number	Soil Description	PID Reading (ppm)
		Concrete	
1		Brown, Fill, Loose, Dry	
2			0.9 ppm
3			
4		Brown Black, Fill, Loose, Dry/Moist	
5			5.5 ppm (sampled)
6			
7		Black to Gray, Fill, Medium Stiff, Moist	
8			
9		Yellowish Red, 5 YR 4/2, Till, Stiff, Dry	0.3 ppm
10			
11			
12		Bottom of Boring 11.5' BGS	
13			
14			
15			
16			
17			
18			
19			
20			

APPENDIX C

ANALYTICAL SUMMARY TABLES

Table 1
Summary of Volatile Organic Compounds Within Soil Boring Interior Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compounds	Concentration (ppm)		
ASB11 (4-4.5')	NONE DETECTED	NA	NA	NA
ASB12 (4-4.5')	1,2,4-Trimethylbenzene	0.0295	190	380
	Acetone	0.0914	500	1000
	Naphthalene	0.0285	NA	NA
ASB13 (8-8.5')	Acetone	0.162	500	1000
ASB14 (8-10')	Acetone	0.151	500	1000
	Isopropylbenzene	0.0121	NA	NA
	Methylcyclohexane	0.0712	NA	NA
	n-Butylbenzene	0.0575	NA	NA
	sec-Butylbenzene	0.0358	500	1000
ASB15 (0-4')	m,p-Xylene	0.0107	500	1000
	Toluene	0.023	500	1000
ASB16 (4-8')	2-Butanone	0.0839	NA	NA
	Acetone	0.422	500	1000
	Carbon disulfide	0.0111	NA	NA
	Methylcyclohexane	0.0101	NA	NA

Table 2
Summary of Semi-Volatile Compounds Within Soil Boring Interior Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compounds	Concentration (ppm)		
ASB11 (4-4.5')	NONE DETECTED	NA	NA	NA
ASB12 (4-4.5')	Benzo (a) anthracene	0.372	5.6	11
	Benzo (b) fluoranthene	0.419	5.6	11
	Chrysene	0.427	56	110
	Fluoranthene	1.570	500	1000
	Phenanthrene	1.830	500	1000
	Pyrene	1.230	500	1000
ASB13 (8-8.5')	NONE DETECTED	NA	NA	NA
ASB14 (8-10')	Ancenaphthene	0.416	500	1000
	Chrysene	0.364	56.0	110
	Fluoranthene	0.371	500	1000
	Fluorene	0.676	500	1000
	Phenanthrene	0.662	500	1000
	Pyrene	0.854	500	1000
ASB15 (0-4')	NONE DETECTED	NA	NA	NA
ASB16 (4-8')	NONE DETECTED	NA	NA	NA

Table 3
Summary of RCRA Metals Within Soil Boring Interior Samples
Northland Supplemental Project, Buffalo

Sample I.D.	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compound	Concentration (ppm)		
ASB11 (4-4.5')	Arsenic	3.46	16	16
	Barium	73.5	400	10,000
	Chromium	15.5	1,500	6,800
	Lead	13.9	1,000	3,900
	Mercury	0.0326	2.8	5.7
ASB12 (4-4.5')	Arsenic	4.53	16	16
	Barium	77.2	400	10,000
	Chromium	16.7	1,500	6,800
	Lead	15.8	1,000	3,900
	Mercury	0.0241	2.8	5.7
ASB13 (8-8.5')	Arsenic	3.47	16	16
	Barium	79.4	400	10,000
	Chromium	16.5	1,500	6,800
	Lead	21.6	1,000	3,900
	Mercury	0.0275	2.8	5.7
ASB14 (8-10')	Arsenic	3.74	16	16
	Barium	106	400	10,000
	Chromium	17.4	1,500	6,800
	Lead	10.5	1,000	3,900
	Mercury	0.0369	2.8	5.7
ASB15 (0-4')	Arsenic	4.04	16	16
	Barium	89.6	400	10,000
	Chromium	17.9	1,500	6,800

Table 3 Continued Summary of RCRA Metals Within Soil Boring Interior Samples Northland Supplemental Project, Buffalo				
Sample I.D.	**Compounds Detected**		**NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)**	**NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)**
	Compound	**Concentration (ppm)**		
ASB15 (0-4')	Lead	22.6	1,000	3,900
	Mercury	0.0699	2.8	5.7
ASB16 (4-8')	Arsenic	6.21	16	16
	Barium	89.9	400	10,000
	Chromium	22.0	1,500	6,800
	Lead	25.0	1,000	3,900
	Mercury	0.0861	2.8	5.7

Table 4
Summary of Polychlorinated Biphenyl (PCB)s Within Soil Boring Interior Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		NYSDEC Part 375-6.4 Restricted Commercial Use Soil Cleanup Objectives (ppm)	NYSDEC Part 375-6.4 Restricted Industrial Use Soil Cleanup Objectives (ppm)
	Compound	Concentration (ppm)		
ASB11 (4-4.5')	NONE DETECTED	NA	NA	NA
ASB12 (4-4.5')	PCB-1254	**2.570**	1	25
ASB13 (8-8.5')	NONE DETECTED	NA	NA	NA
ASB14 (8-10')	PCB-1254	0.938	1	25
ASB15 (0-4')	NONE DETECTED	NA	NA	NA
ASB16 (4-8')	NONE DETECTED	NA	NA	NA

Note: **Bold** indicates exceeding Part 375 Restricted Commercial Use SCOs

Table 5
Summary of Toxicity Characteristic Leaching Procedure (TCLP)
Volatile Compounds Within Pits/Flooring/Drain, Solid Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		
	Compounds	Concentration (ppm)	Regulatory Limit (ppm)
Area A - Wood	NONE DETECTED	NA	NA
Area B - Wood	NONE DETECTED	NA	NA
Area C - Wood	NONE DETECTED	NA	NA
Area D - Wood	NONE DETECTED	NA	NA
PC1 - Solid	NONE DETECTED	NA	NA
PC2 - Solid	NONE DETECTED	NA	NA

Table 6
Summary of Toxicity Characteristic Leaching Procedure (TCLP)
Semi-Volatile Compounds Within Pits/Flooring/Drain, Solid Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		
	Compounds	**Concentration (ppm)**	**Regulatory Limit (ppm)**
Area A - Wood	Cresols (as m,p,o-Cresol)	0.0945	200
Area B - Wood	Cresols (as m,p,o-Cresol)	0.316	200
Area C - Wood	Cresols (as m,p,o-Cresol)	0.101	200
Area D - Wood	NONE DETECTED	NA	NA
PC1 - Solid	NONE DETECTED	NA	NA
PC2 - Solid	NONE DETECTED	NA	NA

Table 7
Summary of Toxicity Characteristic Leaching Procedure (TCLP)
RCRA Metals Within Pits/Flooring/Drain, Solid Samples
Northland Supplemental Project, Buffalo

Sample I.D.	Compounds Detected		
	Compound	**Concentration (ppm)**	**Regulatory Limit (ppm)**
Area A - Wood	Barium	0.5480	100
	Chromium	0.0642	5
	Lead	0.1390	5
	Cyanide (Total*)	1.3100	NA
Area B - Wood	Barium	0.5450	100
	Cadmium	0.0351	1
	Lead	0.1680	5
	Cyanide (Total*)	0.4500	NA
Area C - Wood	Barium	2.0800	100
	Cadmium	0.1730	1
	Chromium	0.2280	5
	Lead	1.2800	5
	Cyanide (Total*)	0.7360	NA
Area D - Wood	Barium	0.9700	100
	Cadmium	0.0396	1
	Lead	1.1200	5
PC1 - Solid	Barium	1.1100	100
	Chromium	0.1000	5
PC2 - Solid	Barium	0.5150	100
	Cyanide (Total*)	0.6510	NA

*Note that cyanide was not tested for Toxicity Characteristic Leaching Procedure (TCLP) but was tested for total.

Table 8
Summary of Toxicity Characteristic Leaching Procedure (TCLP)
Pesticides and Herbicides Within Pits/Flooring/Drain, Solid Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected		
	Compound	Concentration (ppm)	Regulatory Limit (ppm)
Area A- Wood	NONE DETECTED	NA	NA
Area B - Wood	NONE DETECTED	NA	NA
Area C - Wood	NONE DETECTED	NA	NA
Area D - Wood	NONE DETECTED	NA	NA
PC1 - Solid	NONE DETECTED	NA	NA
PC2 – Solid	NONE DETECTED	NA	NA

Table 9
Semi-Volatile Compounds Within Pits/Sumps, Liquid Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected	
	Compounds	Concentration (ppm)
PC1 - Liquid	Phenanthrene	0.0131
PC2 - Liquid	NON-DETECTED	NA
PC3 - Liquid	Phenanthrene	0.0171

Table 10
RCRA Metals Within Pits/Sumps, Liquid Samples
Northland Supplemental Project, Buffalo

Sample I.D.	Compounds Detected	
	Compound	Concentration (ppm)
PC1 - Liquid	Barium	0.05050
	Chromium	0.02980
	Lead	0.00802
	Mercury	0.000248
PC2 - Liquid	Arsenic	0.0105
	Barium	0.0799
	Chromium	0.0599
	Lead	0.0458
	Mercury	0.000476
PC3 - Liquid	Barium	0.1760
	Chromium	0.0148
	Lead	1.4400

Table 11
Polychlorinated Biphenyl (PCB)s Within Pits/Sumps Liquid Samples
Northland Supplemental Project, Buffalo

Sample I.D./ Location	Compounds Detected	
	Compound	Concentration (ppm)
PC1 - Liquid	NONE DETECTED	NA
PC2 - Liquid	NONE DETECTED	NA
PC3 - Liquid	NONE DETECTED	NA

Table 12
Summary of Disposal Characteristics Within Pits/Sumps Solid Samples
Northland Supplemental Project, Buffalo

	Sample I.D./Location						
Analyte	**Area A - Wood**	**Area B - Wood**	**Area C - Wood**	**Area D -Wood**	**PC1**	**PC2**	**Regulatory Limit**
Corrosivity (pH)	6.99 @ 23.7^0 C	6.21 @ 23.4^0 C	6.34 @ 23.2^0 C	6.69 @ 22.5^0 C	7.93 @ 22.8^0 C	6.78 @ 22.3^0 C	<2 or >12.5
Flash Point	>70	>70.0	>70.0	>70.0	>70.0	>70.0	<70.0^0 C
Reactive Cyanide	<100	<100	<100	<100	<100	<100	100
Reactive Sulfide	<100	<100	<100	<100	<100	<100	100
Total Cyanide (ppm)	1.31	0.45	0.736	<0.479	<0.380	0.651	

ATTACHMENT 3

Field Sampling Plan (FSP) – ON CD

FIELD SAMPLING PLAN

For the

Western New York Workforce Training Center
683 Northland Avenue
Buffalo, New York

PREPARED FOR:
NorDel II, LLC

PREPARED BY:

LIRO ENGINEERS, INC.
690 DELAWARE AVENUE
BUFFALO, NEW YORK 11356

December 2016

Table of Contents

1.0 SOP INTRODUCTION

This section contains standard methods and procedures that will be used for the Remedial Investigation (RI) activities in the Remedial Investigation Work Plan (RIWP) for the Western New York Workforce Training Center Site located at 683 Northland Avenue in the City of Buffalo, New York. Field sampling procedures described in these sections are consistent with the requirements and procedures described in the New York State Department of Environmental Conservation (NYSDEC) and United States Environmental Protection Agency (USEPA) field investigation guidance documents. This SOP follows NYSDEC Brownfield Cleanup Program (BCP) requirements and the DER-10 Guidance Document.

2.0 DRILLING

2.1 General

Drilling activities will be performed by qualified well drillers, under the supervision of a qualified and experienced geologist(s). Prior to any intrusive work, underground structures such as storage tanks and the like, utilities, such as gas, electric, oil pipelines, telephone, and sewer and water lines will be identified and the locations of boreholes and monitoring wells will be adjusted, as necessary. The clearance procedure will utilize the resources of the New York "Call Center" as well as the information previously provided to LiRo. During ground intrusive activities such as drilling, the community air monitoring program (CAMP) will be in place.

The drilling rig will be set up and operated in accordance with standard earthwork practice, and in a manner that will allow for safe and efficient operation of the equipment. Overhead power lines, buried utilities, or underground storage tanks will be avoided. Intrusive operations at each soil boring and monitoring well location will include monitoring for potential organic and explosive vapors to protect the workers.

2.2 Geoprobe Sampling

The Geoprobe sampling system employs direct-push technology, which involves a truck-mounted hydraulic probe that is used to advance interconnected small-diameter steel pipe to the required

sampling depth. Samples of soil vapor, soil, and groundwater may be collected using the Geoprobe system. Sample locations situated in paved areas will require the creation of a pilot hole prior to probe use. The Geoprobe soil sampling procedures are as follows:

1. Advance a pilot hole through any surface paving materials.
2. Push the Geoprobe Macro-Core Sampler at 4-foot intervals to prescribed depth or refusal.
3. Retract sampler from the probe hole.
4. Split inner plastic sleeve of the sample, screen sample with photoionization detector (PID) and record readings.
5. Transfer the soil sample from the inner plastic sleeve of the sampler to appropriate sample containers (if samples are required) and label.
6. Examine and describe soil in accordance with Section 6.2. Note and record soil type and any obvious signs of contamination (discoloration, sheen, and odor).

Environmental samples will be collected directly from the Geoprobe sampler with a pre-cleaned or dedicated polyethylene or stainless steel sample trowel and placed in laboratory-provided bottles.

2.3 Hollow-Stem Augering

Drilling performed for monitoring well installation will use a conventional drill rig with hollow stem augers (HSA) and 2-inch or 3-inch split spoon samplers. Field descriptions, observations and air monitoring results will be recorded in a field log book as described in Section 8.5 and on Field Activity Form Geologic Boring Log. The hollow-stem augers will be advanced using a mobile rotary drilling rig as follows:

1. Advance the boring by rotating and advancing the augers to the desired depth below ground surface using ASTM practice D1452. The borings must be advanced incrementally to permit recovery of soil samples for geologic profiling at specified intervals. Samples will be collected using a split-spoon sampler or other appropriate sampling device. Collect drill cuttings for disposal. Do not allow cuttings to form a large pile around the augers.
2. Remove center plug from augers and collect sample.

3. Withdraw sampling device.
4. Lower center plug into augers and advance auger to next sampling depth. The auger will be advanced to a depth in such a manner that minimum disturbance is caused to the ground below the depth designated for sample collection.

The borehole will be advanced, with appropriate soil sampling equipment, until the proper termination depth is reached, as specified in the RIWP. The only exception to this will be if "refusal" occurs during split-spoon sampling. Refusal may occur if the borehole encounters bedrock, rubble, or a boulder. If refusal occurs while sampling, the obstruction will first be attempted to be cleared by rotating the HSA bit through the obstruction. If the HSA cannot penetrate the obstruction, the borehole will be offset and re-drilled.

2.4 Split-spoon Sampling

Split-spoon samples will be collected using ASTM Method D1586-84 (replaced D1586-67), "Standard Method for Penetration Test and Split-Barrel Sampling Procedures" described below.

1. Once the boring is advanced to the desired sampling depth using hollow-stem augering procedures, attach split-spoon sampler to the drill rods and lower into borehole. Do not allow sampler to drop onto the soil to be sampled.
2. Position the hammer and anvil above and attach to the drill rods.
3. Rest the weight of the sampler, drill rods, and hammer on the bottom of the boring and apply a seating blow. If excess cuttings are encountered (not expected since center plug is to be used), remove sampler from the borehole and spin augers until the excess cuttings are removed.
4. Mark the drill rods in four successive 6-inch increments so that the advance of the sampler under the impact of the hammer may easily be observed for each 6-inch increment.
5. Drive the sampler with blows from a 140-pound hammer raised 30 inches and allowed to strike the anvil. Count the number of blows applied in each 6-inch increment until one of the following occurs:
    - A total of 50 blows have been applied during any one of the four 6-inch increments.

        - A total of 100 blows have been applied.
    - There is no observed advancement of the sampler during the application of 10 successive blows. If any of the above three circumstances occur, "refusal" will be declared for this depth and recorded as such.
        - The sampler is advanced the complete length (18 or 24 inches).

6. Record the number of blows required for each 6-inch penetration or fraction thereof. The first 6 inches is considered the seating drive. The sum of the second and third 6 inches of penetration is considered the "Standard Penetration Resistance" or the "N" value. If the sampler is driven less than 18 inches, the number of blows per completed 6 inches will be recorded on the boring log. If the sampler penetrates the full length under the static weight of the drill rods, this information will be recorded on the boring log.
7. Bring the spoon to the surface and open. Record the percent recovery or the length of soil sample recovered. Describe the soil samples recovered as composition, color, stratification, condition and other pertinent information, as outlined in Section 6.2.
8. Obtain an aliquot of sample for chemical analysis from the prescribed intervals of the boring if required.
9. The remainder of the sample may then be disposed of in the borehole, unless a sample is required for laboratory testing of soil properties, such as grain size distribution or Atterberg limits. If a sample is to be submitted for physical testing, place the remainder of the sample into a soil sample jar without distorting the original stratification. Seal container to minimize evaporation and affix label identifying site, boring number, sample depth, the number of blows per six inches, and the testing to be done on the sample.

The ASTM procedure may be modified during the field investigation by driving the sampler the entire length of the split-spoon (24 inches), and/or using a 3-inch diameter sampler (mainly if sample recovery in coarser materials is poor).

2.5 Rock Drilling

Rock drilling will be used if bedrock wells are required. Rock drilling may be performed using a 3-7/8-inch roller type bit or by using a coring device resulting in a 4-inch rock hole. Rock drilling

will be conducted in a manner that prevents any downward migration of contaminants into the bedrock strata. Record field descriptions, observations and air monitoring results in a field log book as described in Section 8.5 and on Field Activity Form Geologic Boring Log. Drilling will be performed following the procedures outlined below.

1. Advance boring using hollow stem augers to refusal.
2. Determine the need for casing off overburden. In contaminated areas, prepare a rock socket and grout permanent 4-inch casing into the rock socket.
3. Prepare for rock drilling by setting up a water circulation system.
4. Assemble and lower the rock bit and drill pipe into the augers or casing.
5. Perform drilling until the desired length of the rock hole is completed.
6. If coring is required, use 5-foot core runs and record rock observations as described in Section 6.3.

2.6 Monitoring Well Installation

Monitoring wells will be installed at locations identified in the Site Investigation Plan. It is anticipated that only shallow overburden wells will be installed; however, in the event that bedrock monitoring wells are required these procedures are included. Monitoring wells will be constructed and developed in accordance with the following procedures:

2.7 Overburden Monitoring Wells

1. Advance subsurface boring to the desired depth by means of hollow-stem auger drilling.
2. Remove center plug from augers and verify borehole depth using weighted measuring tape.
3. Add washed and graded medium sand as needed to base of borehole.
4. Insert 20-slot PVC well screen and riser pipe into borehole through the hollow-stem augers. Cap the riser to prevent well construction materials from entering the well.
5. Add a number 2 graded sand to the screen section of the well while slowly removing augers. Sand pack should extend from 1 to 2 feet above the screen section within the borehole. Measure with a weighted tape.

6. Slowly add bentonite pellet seal to borehole as augers are slowly removed. The bentonite seal should extend at least 2 feet above the top of the sand pack section. Measure with tape.
7. If bentonite seal is placed above the groundwater level within the borehole, add water to the borehole to hydrate the bentonite pellets. Allow pellets to hydrate at least 2 hours.
8. Mix cement/bentonite grout with the general mixture ratios as follows:
   Grout Slurry Composition (% Weight)

1.5 to 3.0%	Bentonite (quick gel)
40 to 60%	Cement (Portland Type I)
40 to 60%	Water

9. Add grout to borehole through tremie pipe or hose from the top of the bentonite seal to the ground surface.
10. Remove remaining augers from borehole.
11. Top off grout in borehole. Grout should extend to approximately 2 feet below ground surface.
12. Cut well riser pipe to about 2 feet above ground surface for stick-up type wells. Flush-mount well risers should be cut off just below surface grade.
13. Backfill remaining two feet of borehole with concrete.
14. Install protective casing over well riser pipe and set into concrete backfill.
15. Lock protective casing cap.
16. Document well construction on Field Activity Form Monitoring Well Construction Detail.

2.8 Bedrock Well Construction

1. Advance 6-1/4 inch I.D. hollow-stem augers to the top of bedrock and continue augering to create a rock socket through the bedrock weathered zone.
2. Pressure grout 4-inch steel casing into rock socket.
3. Remove hollow-stem augers and grout annular space between casing and borehole wall.

Let grout cure a minimum of 24 hours before continuing with the boring.

4. Insert nominal 4-inch corer into 4"steel casing and core 15 feet into bedrock or to intersection of sufficient fractures in bedrock to allow adequate water flow.
5. Verify borehole depth using weighted measuring tape.
6. Add washed and graded medium sand as needed to base of borehole.
7. Insert 20-slot PVC well screen and riser pipe into borehole through 4" steel casing. Cap the riser to prevent well construction materials from entering the well.
8. Add a number 2 graded sand to the screen section of the well. Sand pack should extend from 1 to 2 feet above the screen section within the borehole. Measure with a weighted tape.
9. Slowly add bentonite pellet seal to borehole. The bentonite seal should extend at least 2 feet above the top of the sand pack section. Measure with weighted tape.
10. If bentonite seal is placed above the groundwater level within the borehole, add water to the borehole to hydrate the bentonite pellets. Allow pellets to hydrate at least 2 hours.
11. Mix cement/bentonite grout with the general mixture ratios as follows:
    Grout Slurry Composition (% Weight)

1.5 to 3.0%	Bentonite (quick gel)
40 to 60%	Cement (Portland Type I)
40 to 60%	Water

12. Add grout to borehole through tremie pipe or hose from the top of the bentonite seal to approximately 2 feet below ground surface.
13. Cut well riser pipe to about 2 feet above ground surface for stick-up type wells. Flush-mount well risers should be cut off just below surface grade.
14. Backfill remaining two feet of borehole with concrete.
15. Install protective casing over well riser pipe and set into concrete backfill.
16. Lock protective cap.
17. Document well construction details on Field Activity Form Monitoring Well Construction.

3.0 VISUAL IDENTIFICATION/GEOLOGICAL DESCRIPTION

3.1 Field Equipment Requirements

The geologist will prepare geologic descriptions of the in-place subsurface soils, residue, and native materials, and collect representative samples from the prescribed intervals for chemical analysis. Prior to the start of drilling, care will be taken that, as a minimum, the following documents, equipment and supplies are available and in good working order:

- Copies of Work Plan
- List of appropriate contacts, with phone numbers
- Field logbook and paper
- Site topographic map
- Waterproof marking pens (for sample boxes and containers)
- Sample jars and chemical analysis vials and bottles
- Health and Safety equipment, per HASP
- Field monitoring instruments, per HASP
- Other specialized equipment per site-specific work activities.

3.2 Soil Classification

Soils will be classified using the Unified Soil Classification System (USCS) as described in ASTM Method D2488-84, "Practice for Description and Identification of Soil visual-Manual Procedure", and ASTM D2487-85, "Test Method for Classification of Soils for Engineering Purposes". According to the USCS system, soils are divided into three major groups: coarse-grained, fine-grained, and highly organic (peaty). The boundary between coarse-grained and fine-grained soils is the 200-mesh sieve (0.074 mm). In the field the distinction is based on whether the individual particles can be seen with the unaided eye. If more than 50% of the soil by weight is judged to consist of grains that can be distinguished separately, the soil is described to be coarse-grained. The coarse-grained soils are divided into gravelly (G) or sandy (S) soils, depending on whether more or less than 50% of the visible grains are larger than the No.4 sieve (3/16 inch). They are each divided further into four subgroups:

W: Well graded; fairly clean (<5% finer than 0.074 mm)

P: Poorly graded (gap-graded); fairly clean (<5% finer than 0.074 mm)

C: Dirty (>12% finer than 0.074 mm); plastic (clayey) fines

M: Dirty (>12% finer than 0.074 mm); non-plastic or silty fines

The soils are represented by symbols such as GW or SP. Borderline materials are represented by a double symbol, such as GW-GP.

The fine-grained soils are divided into three groups: inorganic silts (M), inorganic clays (C), and organic silts and clays (O). The soils are further subdivided into those having liquid limits lower than 50% (ML, CL, OL), or higher (MH, CH, OH).

The distinction between inorganic clays and silts, or organic silts and clays, is made on the basis of plasticity. Organic soils, O, are distinguished from inorganic soils by their characteristic odor and dark color.

In the field, the fine-grained soils may be differentiated by their dry strength, their reaction to the shaking test, or their toughness near the plastic limit. Borderline materials are represented by a double symbol, such as CL-ML. Like all procedures based on grain size or remolded properties of soil, the classification cannot fully represent the engineering response of the in-situ soil mass. Soil properties required to define the USCS designation and provide a geologic description are the primary features considered in field identification. These properties and other observed characteristics normally identified in a soil description are defined in this section and include:

a. Color (using Munsell color chart)

b. Moisture condition

c. Grain size

(1) Estimated maximum grain size

(2) Estimated percent by weight of fines (material passing No. 200 sieve)

d. Gradation (well graded, poorly graded)

e. Grain shape (angular, subangular, and rounded)

f. Plasticity

g. Predominant soil type

h. Secondary components of soil

i. Classification symbol

j. Other features such as:

- Organic, chemical, or metallic content
- Compactness
- Consistency Cohesiveness near plastic limit
- Dry strength
- Source: residual, or transported (aeolian, waterborne, glacial deposit, etc.).

3.3 Rock Description

It is not anticipated that bedrock will be encountered during monitoring well installation. However; if bedrock is encountered, the following procedures will be followed.

Rock core descriptions should include, at a minimum, rock type, color, relative hardness, brokenness, core recovery, and rock quality designation (RQD). In addition, pertinent drilling observations such as coring rate, loss of drilling water, and presence of voids should be recorded in the field logbook and boring logs.

In describing the rock core, naturally occurring breaks or discontinuities should be described in detail. The discontinuity description should include spacing and orientation (dip) of fractures as well as distinction between bedding plane, joint or foliation features and evidence of water-bearing zones (solution features or stained fracture surfaces) within the rock core.

4.0 SURVEY OF SAMPLE LOCATIONS

Soil boring, monitoring well, and soil vapor and air sampling locations will be surveyed for horizontal and vertical coordinates by a licensed New York State surveyor and referenced to the existing site survey. Basement boring locations or interior room locations that are inaccessible to survey equipment will be located by tape measuring from at least two adjacent building exterior wall corners.

5.0 SAMPLE COLLECTION PROCEDURES FOR CHEMICAL ANALYSIS

5.1 Soils

Soil samples will be collected for chemical analysis as described in the Site Investigation Plan. This section discusses the procedures for collecting an aliquot of sample for chemical analysis at the intervals specified in the work plan. All chemical analysis for soils must be performed by a New York State Department of Health certified laboratory.

The detailed procedure for soil sample collection is outlined below:

1. Screen soil with PID. Record any physical characteristics (e.g., obvious contamination, or discoloration) in the field logbook.
2. Using a pre-cleaned trowel or spoon, collect a sample for volatile organic analysis from soil showing the highest PID reading or other evidence of contamination
3. If additional chemical analysis is required (i.e., semi-volatile organics, metals, PCBs), use a pre-cleaned trowel or spoon to place three aliquots of soil in a decontaminated mixing bowl and thoroughly mix soil using cone & quarter method until a consistent physical appearance is achieved.
4. Transfer sample to laboratory-cleaned (I-Chem Series 300 or equivalent) sample containers.
5. Record field sampling information in the field logbook as outlined in Section 6.
6. Label each sample container with the appropriate sample identification data and place sample in a cooler for shipment to the laboratory.
7. Initiate chain-of-custody procedures.

5.2 Groundwater

Groundwater samples will be collected for chemical analysis as described in the Site Investigation Plan. This section discusses the procedures for collecting a sample of groundwater for chemical analysis from a monitoring well. To collect representative groundwater samples, groundwater wells must be adequately developed and purged prior to sampling. Development and purging field

information will be recorded on Field Activity Forms Well Development Log and Well Purge Log. Purging will require the removal of three to five volumes of standing water in rapidly recharging wells and at least one volume from wells with slow recharge rates. Shallow wells in which the screen intersects the water table should require a minimum amount of purging since the groundwater would flow through the screen and not be entrapped in the casing. Deeper wells should be purged more thoroughly since they may be located in confined aquifers and water may rise up into the casing. A thorough purging would require the removal of several volumes of this trapped water to ensure that representative groundwater is brought into the casing for sampling. Sampling should commence as soon as adequate recharge has occurred.

All chemical analysis for groundwater must be performed by a New York State Department of Health certified laboratory. Groundwater samples will be labeled and shipped following procedures outlined in Section 8.3 and 8.4 and analyzed according the program outlined in Section 2.2 of the Site Investigation Plan.

5.3 Well Purging Procedures

1. The well cover will be unlocked and carefully removed to avoid having any foreign material enter the well. The interior of the riser pipe will be monitored for organic vapors using a PID. If a reading of greater than 5 ppm is recorded, the well will be vented until levels are below 5 ppm before purging starts.
2. Using an electronic water level detector, the water level below top of casing will be measured. Knowing the total depth of well, it will be possible to determine the volume of water in the well. The end of the probe will be soap and water washed and de-ionized water-rinsed between wells.
3. On wells with water levels that remain 25 feet or less below the top of casing, a suction-lift pump will be used to remove three to five times the well volume, measured into a calibrated pail. (A well volume will be defined as the volume of water standing inside the casing measured prior to evacuation.) Dedicated new polyethylene discharge and intake tubing (3/8” inner-diameter (I.D.) low-density polyethylene) will be used for each well.

During this evacuation of the well, the intake opening of the pump tubing will be positioned just below the surface of the well water. If the water level drops, then the tubing will be lowered as needed to maintain flow. Pumping from the top of the water column will ensure proper flushing of the well. Pumping will continue until required volumes are removed.

If the well purges to dryness and recharges rapidly (within 15 minutes), water will continue to be removed as it recharges until the required volumes are removed. If the well purges to dryness and is slow to recharge (greater than 15 minutes), evacuation will be terminated.

4. If the water level of a well is initially below 25 feet, or draws down to this level because of a slow recharge rate, then a 1-1/2 inch bailer, 5 to 10 feet in length, will be used to evacuate the well. The line for this bailer will be dedicated new ¼-inch nylon. It will be discarded after use. Prior to use in the field, the dedicated purging bailer will be cleaned per Section 8.6 procedures.
5. Purging will continue until three volumes of water have been removed. Well volume will be calculated as detailed on the Well Purge Log. Measurements for pH, turbidity, and conductivity will be recorded during purging. The stability of these measurements with time will be used to guide the decision to discontinue purging.
6. All well purge water will be discharged to the ground surface unless there is evidence of contamination (historical data indicates limited groundwater contamination) or as directed by the NYSDEC representative in which case it will be containerized for off-site disposal.
7. Well field data are to be recorded in the field notebook and Field Activity Forms Well Development Log and Well Purge Log.

5.4 Groundwater Sampling Procedures

1. Groundwater samples will be collected on the same day as well purging at any time after the well has recovered sufficiently to sample, or within 24 hours after evacuation, if the well recharges slowly. If a well does not contain or yield sufficient volume for all required laboratory analytical testing (including quality control), then a decision will be made to prioritize analyses. If a well takes longer than 24 hours to recharge, then a decision will be

made after consultation with the NYSDEC representative whether or not the groundwater sample will be considered valid.

2. After well purging is completed and the well has recharged sufficiently per the previous item, a sample will be collected into appropriate containers using a dedicated HDPE bailer. The bailer will have a 5-foot monofilament polypropylene or stainless steel "leader" which will be attached to a clean, dedicated ¼-inch nylon line. The bailer will be lowered below the surface of the water so as to allow the water to touch only the "leader" and not the nylon rope.
3. All sample bottles will be labeled in the field using a waterproof permanent marker. Procedures outlined for Sample Labeling (Section 8.3) and Sample Shipping (Section 8.4) will be followed.
4. Samples will be collected into verifiably clean sample bottles (containing required preservatives) and placed on ice in coolers prior to shipment to the analytical laboratory. Chain of custody will be initiated by completing Field Activity Form Chain of Custody. The analytical laboratory will certify that the sample bottles are analyte-free.
5. A separate sample of approximately 200 ml will be collected into a 60-ounce plastic bottle to measure pH, conductivity, turbidity, and temperature of the well in the field.
6. Well sampling data are to be recorded in the field notebook and on Field Activity Form Well Purge Log.

5.5 Indoor and Ambient Air Sampling Procedures

Indoor and ambient air samples will be collected in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (New York State Department of Health [NYSDOH] October 2006). Sampling will occur for the duration of greater than two hours. Samples will be collected in appropriate sized Summa canisters that have been certified clean by the laboratory and samples will be analyzed by using United States Environmental Protection Agency (USEPA) Method TO-15. Flow rate for both purging and sampling will not exceed 0.2 L/min.

5.6 Soil Vapor Sampling Procedures

Soil vapor samples will be collected in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH October 2006). The soil vapor sampling implants will be fitted with inert tubing (e.g., polyethylene, stainless steel, nylon, Teflon®, etc.) of the appropriate size (typically 1/8 inch to 1/4 inch diameter) and of laboratory or food grade quality to the surface. Soil vapor probes will be sealed above the sampling zone with bentonite slurry for a minimum distance of three feet to prevent outdoor air infiltration and the remainder of the borehole backfilled with clean material.

Sampling will occur for the duration of greater than two hours. Samples will be collected in appropriate sized Summa canisters that have been certified clean by the laboratory and samples will be analyzed by using United States Environmental Protection Agency (USEPA) Method TO-15. Flow rate for both purging and sampling will not exceed 0.2 L/min. 24-hours following soil vapor probe installation, one to three implant volumes shall be purged prior to the collection of any soil-gas samples.

As part of the vapor intrusion evaluation, a tracer gas will be used in accordance with NYSDOH protocols to serve as a quality assurance/quality control (QA/QC) device to verify the integrity of the soil vapor probe seal. A container (box, plastic pail, etc.) will serve to keep the tracer gas in contact with the probe during testing. A portable monitoring device will be used to analyze a sample of soil vapor for the tracer gas prior to sampling. If the tracer sample results show a significant presence of the tracer, the probe seals will be adjusted to prevent infiltration. At the conclusion of the sampling round, tracer monitoring will be performed a second time to confirm the integrity of the probe seals.

5.7 Sample Labeling

In order to prevent misidentification and to aid in the handling of environmental samples collected during the field investigation, the following procedures will be followed:

1. Affixed to each sample will be a non-removable (when wet) label. The sample bottle will

be wrapped with 2-inch cellophane tape. Apply label and wrap with tape to cover label.

2. The following information will be written with permanent marker:
    - Site name
    - Sample identification
    - Project number
    - Date/time
    - Sampler's initials
    - Sample preservation
    - Analysis required.
3. Each sample of each matrix will be assigned a unique identification alpha-numeric code utilizing the following abbreviations:
    - MW = monitoring well
    - S = shallow
    - D = deep
    - GW = groundwater sample
    - LW = leachate sample
    - TB = trip blank
    - RB = rinse blank
    - MS = matrix spike
    - MSD = matrix spike duplicate.

5.8 Sample Shipping

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 presentation of sample analytical chemistry 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.

1. The chain-of-custody should be completed with relevant information and placed inside the

sample cooler.

2. Cushion the bottom, sides and top of the cooler with bubble pack material.
3. Place bottles in cooler in such a way that they do not touch using bubble pack.
4. Pack coolers with ice in ziplock plastic bags.
5. Secure the cooler lid.
6. Place lab address on top of cooler and ship samples via overnight carrier the same day that they are collected to the laboratory.

5.9 Field Log Book

Field activities including drilling and sampling will be documented daily in bound logbooks with pre-numbered pages. These books are to accompany the samplers to each sample location. Maintenance and legibility of the field logbooks is the responsibility of each sampler. Logbook entries will be made in indelible ink. All changes to field notes will be initialed in ink. Information to be recorded during environmental sampling activities shall include such items as:

- name of site and type of sample
- purpose of sampling (i.e., monitoring, sample collection)
- sample number, volume, and description
- procedure performed during sampling
- sampling location, including sketch with measurements to physical features
- date and time of each sampling event
- sampler name(s)
- field instrument calibration information
- field measurements such as PID and methane readings
- weather conditions
- sample distribution and shipping.

Information to be recorded during drilling activities shall include such items as:

- names of field investigators and drilling personnel
- start and completion times of each drilling event
- measurements and quantities of materials used during drilling

- depth and identification number of soil samples collected for chemical analysis
- monitoring well completion data
- water level measurements and grout levels (borehole sealing information)
- record of site visitors
- PID measurements.

5.10 General Documentation Requirements

The results of all field activities will be documented in the field log book and appropriate field activity forms. The field activity forms anticipated for this project include: Geologic Boring Log, Monitoring Well Construction Detail, Well Development Log, Well Purging Log, and Chain of Custody Form.

5.11 Equipment Decontamination and Investigation-Derived Soil and Water

Reusable equipment used to collect samples, such as macro-core tubes and stainless steel mixing bowls will be hand cleaned using a sequence of: an alconox/water wash, tap water rinse and de-ionized water rinse between each use. Dedicated (i.e., disposable) sampling equipment is for one-time use and will not require decontamination. All IDW will be managed in accordance with DER-10.

Auger cuttings, development water, purge water and equipment decontamination water will be containerized, characterized and disposed of at an off-site facility. Used personal protective equipment will be placed in contractor grade trash bags for off-site disposal.

ATTACHMENT 4

Quality Assurance Project Plan (QAPP) – ON CD

QUALITY ASSURANCE PROJECT PLAN
FOR THE

Western New York Workforce Training Center
683 Northland Avenue
Buffalo, New York

PREPARED FOR:

NorDel II, LLC

PREPARED BY:

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1.0 QAPP INTRODUCTION

This QAPP provides an overview of quality assurance/quality control (QA/QC) programs which will be adhered to during the Remedial Investigation activities described in the Remedial Investigation Work Plan (RIWP). This QAPP gives specific methods and QA/QC procedures for chemical testing of environmental samples obtained from the site, which will ensure the quality and ultimate defensibility of data produced during the Remedial Investigation.

This QAPP was prepared using elements from the following guidance documents below:

1. Sampling Guidelines and Protocols, New York State Department of Environmental Conservation, September 1992;
2. Guidance for the Data Quality Objective Process, EPA QA/G-4(EPA/600/R-96/055), dated August 2000;
3. Test Methods for Evaluating Solid Waste – Physical/Chemical Methods, SW-846, Third Edition, November 1986; Final Update IIIA, March 1999;
4. EPA Region II Contract Lab Program Organics Data Review and Preliminary Review, Standard Operating Procedures #HW-6, Revision 12, and;
5. Evaluation of Metals Data for the Contract Laboratory Program, Standard Operating Procedure #HW-2, Revision 11;

1.1 Data Quality Objectives (DQO)

The USEPA DQO Guidance document specifies that sampling programs be designed in order to meet the requirements of the investigation and achieve the DQOs. Part of this process is to determine what data is being collected and how it will be used in assessing Site conditions. For the purposes of this project, two types of data will be produced. Definitive data will be collected from samples that are submitted to an approved laboratory for analysis. Screening data will be produced using field measurement instruments in order to refine the sampling program so as to provide a complete set of definitive data.

These objectives will be attained by strict adherence to the RIWP, the Field Sampling Plan, and the QAPP as well as by utilizing trained and experienced personnel to perform all tasks required to collect the data. Specific QA/QC objectives of the various program elements are discussed in the following sections.

Laboratory QA procedures regarding personnel, management structure, analytical equipment, and data management are contained in the laboratory's Quality Assurance Plan (LQAP). A copy of the LQAP will be provided under separate cover if requested.

1.2 QA/QC for Environmental Samples

The project QA/QC goals will be attained for the collection of environmental samples by strict compliance with the sampling methods and procedures outlined in the RIWP. Only trained personnel, after consultation with the Project Manager as listed in the RIWP, will carry out these sampling procedures. QA/QC will also be assured by the use of appropriate containers and preservation methods. In addition, the holding times and sample preservation listed in Tables 6 and 7 will be followed to ensure integrity of all environmental samples. All samples will be held under proper chains of custody and be controlled by appropriate labels/paperwork as outlined in this QAPP. The laboratory will be required to analyze the samples in accordance with the methods, laboratory precision and recovery limits specified in Tables 1 through 4, and provide data deliverables in compliance with NYSDEC Analytical Services Protocol (ASP).

1.3 Analytical Methods

To achieve the QA/QC goals, the chemical analysis indicated in Tables 1 and 3 will be performed in accordance with the referenced USEPA test methods which are cited in NYSDEC ASP. The investigation requires very strict QA/QC procedures which will be followed on all samples for the parameters listed below.

- Target Compound List (TCL) Volatile Organics
- TCL Semi Volatile Organics
- TCL Pesticides/PCBs

- Target Analyte List (TAL) Metals and RCRA Metals

Tables 6 and 7 also summarize the sample bottle and holding time requirements for the site investigation. The environmental samples will not be diluted to remove chemical interferences. Dilutions are permitted only to bring TCL/TAL analytes within instrument calibration range. If analytical cleanups are necessary, then the laboratory must make best efforts to remove interferences through the cleanup techniques described in EPA Publication SW-846 or the EPA "Contract Laboratory Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration" in effect as of the date of sample analysis. QA/QC goals are also achieved by the use of the required number of field and laboratory quality control samples as indicated on Table 8. The definitions of each QC sample type are found in this QAPP.

Prior to any modifications from the listed test methodologies, the Laboratory Director will contact the RI Project Chemist to review the modification(s).

1.4 QA/QC Objectives for Chemical Measurement

In general, data quality indicators include precision, accuracy, representativeness, completeness, and comparability (PARCC). Each indicator may be defined as follows:

1. Precision is the agreement or reproducibility among individual measurements of the same property, usually made under the same conditions;
2. Accuracy is the degree of agreement of a measurement with the true or accepted value;
3. Representativeness is the degree to which a measurement accurately and precisely represents a characteristic of a population, parameter, or variations at a sampling point, a process condition, or an environmental condition;
4. Completeness is a measure of the amount of valid data obtained from a measurement system compared with the amount that was expected to be obtained under correct normal conditions; and,
5. Comparability is an expression of the confidence with which one data set can be compared with another data set in regard to the same property.

QA objectives vary according to the specific objectives of each analysis. The *accuracy and precision* of data will be functions of the sample origin, analytical procedures and the specific sample matrices. QC practices used to evaluate these data quality indicators include use of accepted analytical procedures, adherence to sample preservation and hold time, and analysis of QC samples such as blanks, replicates, spikes, calibration standards and reference standards.

For each analytical parameter, quantitative objectives for precision, accuracy and sensitivity (reporting limits) were established in accordance with the specific analytical method employed, published historical data, laboratory method validation studies, and laboratory experience with similar samples. Tables 1 through 4 summarize the accuracy and precision for groundwater and soil samples, and Table 5 identifies the sensitivity goals for the TCL/TAL. Notably, these reporting limits are the minimum reporting limits appropriate for undiluted samples. The actual reporting limits for individual samples and analyses may be elevated due to contaminant concentrations in excess of the method calibration range, sample matrix cleanup procedures, and percent moisture adjustment for soil samples.

Representativeness is a qualitative characteristic which primarily addresses proper design of a sampling program in terms of number and location of samples and sample collection techniques. The rationale for the number and location of samples for this project is discussed in the RIWP and the sampling procedures are described in Section 8.0 of this Work Plan. The representativeness of the analytical data is also a function of the procedures used to process the samples. Standard USEPA or USEPA-accepted analytical procedures will be followed as identified in Section 9.3 and the LQAP.

Completeness is a quantitative characteristic which is defined as the percentage of valid data obtained from a measurement system (sampling and analysis), as compared to that which was planned. Completeness can be less than 100 percent due to low sample recovery, inaccessibility to sample locations, sample loss during shipment, or disqualification of sample results which are outside of specific quality control criteria due to laboratory error or matrix-specific interference. Completeness is documented through field and laboratory reports which allow the data user to

assess the quality and usability of the results. The completeness goal for laboratory measurements will be 90 percent, and the overall project completeness goal (field and laboratory) will be 85 percent.

Comparability is a qualitative characteristic which allows for comparison of analytical results with those obtained by other laboratories. This may be accomplished through the use of standard accepted methodologies, traceability of standards to National Bureau of Standards (NBS) or USEPA sources, use of appropriate levels of quality control, reporting results in consistent, standard units of measure and participation in inter-laboratory studies designed to evaluate laboratory performance.

Samples collected during the project will be analyzed for the parameters outlined in Tables 1 and 3. The PARCC criteria in Tables 1 through 4 may not always be achievable. The NYSDEC ASP data validation guidelines provide direction for the determination of data usability. Qualified data can often provide useful information, although the degree of certainty associated with the results may not be as planned. Professional judgment will be used to determine data usability with respect to project goals.

2.0 CHEMICAL DATA REDUCTION

NYSDEC ASP will be employed for documentation and reporting of all data. The deliverables package will conform to the latest NYSDEC ASP. Additional deliverables may also be required for data validation.

Laboratory data reduction procedures are identified in the QAPP. In general, identification of all analytes must be accomplished with an authentic standard of the analyte, traceable to National Institute of Standards (NIST) or EPA sources. When authentic standards are not available, identification is tentative (as is the case with volatile and semi-volatile Tentatively Identified Compounds). Other criteria that must be utilized when determining the presence or absence of target compounds are mass spectra comparisons, retention time windows and response factors relative to those of the authentic standard. Data reduction is to be performed by individuals experienced with a particular analysis.

All field records will be compiled and retained in LiRo's project files. Analytical data packages will contain all information necessary for data validation, if data validation should be required. At a minimum, the following information is needed as appropriate to the analytical methodology:

- Case narrative;
- Chain of Custody (COC) records;
- QC summaries (i.e.: blanks, spikes, duplicates, serial dilutions);
- Analytical data report;
- Calibration information (including instrument performance checks);
- Chromatograms;
- Quantitation reports;
- Spectra;
- Analytical sequence logs; and,
- Sample preparation logs.

The laboratory will keep sample evidence files containing the following items:

- COC records;

- Sample log-in information (if applicable);
- Copies of laboratory records and notebook pages;
- Copies of laboratory bench data sheets;
- Instrument raw data, both hardcopy and electronic;
- Chromatograms;
- Pertinent correspondence memoranda; and,
- Final report file.

LiRo will retain relevant and appropriate project information in project files. The information contained in these files includes, but is not limited to, the following items:

- COC records;
- Field notes and information;
- Correspondence and telephone memoranda;
- Meeting notes;
- Laboratory information;
- Data validation information;
- Reference information;
- Audit information; and,
- Copies of reports.

2.1 Data Validation

Validation will be performed by a third party data validator. The data will be audited and validated for compliance with the ASP requirements. Data deliverables will be reviewed for completeness, sample preservation and holding time compliance, calibration and method blank contamination, instrument calibrations, analytical spike recoveries and compound identification. If discrepancies or deviations are found in the data package, the laboratory will be contacted to clarify specific issues.

Data validation techniques include screening and accepting, rejecting or qualifying data on the basis of specific quality control criteria for sample preservation and holding time compliance,

instrument calibration, method blank results, analytical spike results, surrogates, and laboratory and field duplicates. Data validation is a process whereby erroneous data may be identified prior to entering the project record. Validation of field measurements will be performed by field personnel in consultation with technical supervisors. Field personnel will validate the field data through review of calibration and duplicate data readings. The data will be reviewed to determine if there are any anomalous readings. Anomalies will be resolved immediately by means such as re-calibration or re-acquisition of the measurement.

For all analytical samples associated with this project, the laboratory will produce NYDEC data packages that will contain all information needed for formal validation of the data. Data validation will be performed in accordance with the USEPA Region II Standard Operating Procedures (SOPs) HW-6, Revision 12 (TCL Organics data) and HW-2, Revision 11 (TAL Inorganics data). These procedures are specific with regard to evaluation of holding time, surrogate and spike recoveries, precision of duplicate measurements, calibration and instrument performance, blank contamination, compound identification, and compound quantification. Data will be qualified as necessary in accordance with the SOPs and any qualification will be explained in a data validation narrative.

Once the validation process is completed, the data usability will be determined. A data usability summary report (DUSR) will be appended to the Site Investigation Report. The data usability report will identify data deficiencies, analytical protocol deviations and quality control problems. The report will include recommendations for data usability and any required resampling or reanalysis.

2.2 Quality Control Samples

Various QA/QC samples will be analyzed to assess the quality of the data resulting from the field sampling and analytical programs. The following identifies the QA/QC samples to be analyzed, at a minimum as well as the frequency of analysis.

2.2.1 Laboratory Quality Control Samples

A. Method Blanks: Method blank is defined as laboratory-demonstrated analyte-free water that

is carried through the entire analytical procedure. Method and field/rinsate are not expected to contain any target analytes with concentrations greater than the reported detection limit with the possible exception of common laboratory contaminants (i.e., methylene chloride, acetone, 2-butanone, and phthalate esters). Method blanks are analyzed at a frequency defined by the ASP document.

B. Matrix Spike Samples: An aliquot of a matrix (water or soil) is spiked with known concentrations of specific compounds as stipulated in the ASP document. The matrix spike and matrix spike duplicate are subjected to the entire analytical procedure in order to indicate both accuracy and precision of the method for the matrix by measuring the percent recovery and Relative Percent Difference (RPD) of the two spiked samples. MS/MSD data are assessed based upon the percent recovery of spiked analytes using the following equation:

$$\% R = \frac{(SSR - SR)}{SA} \times 100\%$$

where, SSR = Spiked sample result for analyte x;
SR = Sample result for analyte x; and,
SA = Spike added of analyte x.

The relative percent difference between the MS/MSD results is calculated using the RPD equation presented above. Each matrix spike set includes a matrix spike blank sample. MS/MSDs are analyzed at a frequency stated in Table 8.

C. Laboratory Control Samples: Laboratory control spike samples (LCS) provide information about the accuracy of the analytical system, independent of matrix. LCS are laboratory-generated sample spikes with target analytes at concentrations appropriate to the analyses. LCS will be analyzed as part of every analytical batch.

2.2.2 Field Quality Control Samples

A. Trip Blanks - The primary purpose of the trip blank is to detect additional sources of contamination that might potentially influence contaminant values reported in actual

samples both quantitatively and qualitatively. Possible sources of contamination may be laboratory reagent water, sample containers, and sample handling procedures in the field and at the laboratory. Trip blanks will be defined as two 40 ml Volatile Organics Analysis (VOA) vials filled with laboratory-demonstrated analyte-free water. This water must originate from one common source within the laboratory and must be the same water used by the laboratory performing the analysis. Trip blanks should be handled and transported in the same manner as the samples acquired that day, except that trip blanks are not opened in the field. Instead, they travel with the sample containers. Trip blanks must return to the laboratory with the same set of containers they accompanied to the field, and are analyzed for VOAs only.

B. Rinse Blanks - The purpose of a rinse blank is to provide a check on possible sources of contamination resulting from exposure to the ambient air or from improperly cleaned sampling equipment. The rinse blank is opened in the field and the laboratory water is passed through the cleaned sampling equipment and placed in the empty containers. This water must originate from one common source within the laboratory and must be the same water used by the laboratory performing the analysis. The rinse blank should be collected, transported, and analyzed in the same manner as the samples acquired that day. Rinse blanks must be packaged with their associated matrix and will be collected for each matrix as specified in Table 8.

C. Field Duplicates – Field duplicates are samples collected simultaneously for the same analyte or set of analytes at one location, after which they are treated as separate samples. If the sampling matrix is homogeneous, field duplicates provide a means of assessing the precision of collection methods. Field duplicates are collected by sampling the same location twice, but the field duplicate is assigned a unique sample identification number. Field duplicate results are assessed based upon relative percent difference (RPD) between values, using the following equation:

i. $$RPD = \frac{(D1 - D2)}{(D1 + D2)/2} \times 100\%$$

where, D1 = Primary sample result; and,

D2 = Duplicate sample result.

D. Split Samples - Split samples are used for performance audits or inter-laboratory comparability of data. At this time, no split sample collection is planned. If split samples are required to be collected, then the following will apply: A split sample will be defined as two separate samples taken from a single aliquot which has been thoroughly mixed or homogenized prior to the formation of the two separate samples.

3.0 ENVIRONMENTAL SAMPLE CUSTODY AND SHIPPING PROCEDURES

The ultimate accuracy of any data generation begins with a sampling and measurement procedure that is well conceived and carefully implemented. The details of the sampling protocols are provided in this section, which presents the procedures with which samples will be acquired or measurements made during the execution of the project. The laboratory methods referenced in this plan are consistent with the NYSDEC ASP.

3.1 Sample Custody and Responsibilities

Procedures contained in the chain-of-custody guidelines outlined in NEIC Policies and Procedures, prepared by the National Enforcement Investigations Center of the USEPA office of Enforcement will be utilized. Specific procedures to be used are described below.

3.1.1 Custody Definitions

Chain-of-Custody Officer - The Chain-of-Custody Officer will be responsible for oversight of chain-of-custody activities. The lead geologist or lead sampler will usually implement these activities.

A sample is "Under Custody" if:

1. It is in the possession of the Chain-of-Custody Officer; or
2. It is in the view of the Chain-of-Custody Officer, after being in his possession; or
3. It was in his possession and he locked it up; or
4. It is in a designated secure area.

3.1.2 Responsibilities

The Chain-of-Custody Officer is responsible for monitoring all chain-of-custody activities and for collecting legally admissible copies of chain-of-custody documentation for the permanent project file. He shall be responsible for:

1. An initial review of sample labels and/or tags, closure tapes, and chain-of-custody record

and split-sample forms provided by the laboratory. The Chain-of-Custody Officer will document this review in the field logbook.

2. Training of all field sampling personnel in the methodologies for carrying out chain-of-custody procedures and the proper use of all chain-of-custody forms and record documents.
3. Monitoring implementation of chain-of-custody procedures.

The chain-of-custody is initiated in the laboratory when the sample containers and vials are prepared, packed, and shipped to the site. When the sample containers are received they will be checked for any breach of chain-of-custody seals or evidence of tampering.

All samples shall be adequately marked for identification from the time of collection and packaging through shipping and storage. Marking shall be on a sample label attached to the sample container. Sample identification shall include, as a minimum:

- Project name and/or code;
- Sample identification number;
- Analysis requested;
- Chemical preservatives added to the sample container;
- Sample date and time; and,
- Initials of the individual performing the sampling (samples for chemical analysis).

At the time of sampling, the field sampling personnel will record sample information on a chain-off-custody form. Chain-of-custody form entries will be made in indelible ink.
After sampling containers are filled, the field sampling personnel will place the filled containers in coolers preserved with ice and maintain custody of all samples until they are transferred to the field office for processing. After samples are processed, they will be prepared for shipping to Chemtech in Mountainside, New Jersey. Samples will be shipped within 48 hours of sample collection.

3.2 Split-Sample Records

Whenever samples are split, a split-sample receipt will be prepared. The receipt will describe the samples being split, including the quantity (mass or volume) of each sample portion. Both the laboratory (and field sampling personnel, should samples be split in the field) and the recipient of the split samples will retain copies of the receipt. The chain-of-custody forms will be used to document split-sample receipts and will accompany both portions of the sample.

4.0 SAMPLE LABELING AND SHIPPING

Each label will include such information as the following:

- site name
- sample identification
- project number
- date/time
- samplers' initials
- sample preservation (if any) designation
- analysis required

Each sample will be assigned a unique alpha-numeric identification code. An example of this code and a description of its components are presented below:

4.1 Sample Identification Codes

List of Abbreviations

Sample Location Identifications

TP = Test Pit
MW = Groundwater monitoring well
SB = Soil Boring
XX = Depth of Soil Boring
LE = Leachate

Other Label Information

GW = Groundwater
TB = Trip blank
RB =Field Rinse Blank

FD = Field Duplicate (Will have the same name as the primary sample, with an FD added to the end of the ID)
MS = Matrix Spike
MSD = Matrix Spike Duplicate

The samples collected will be categorized as environmental samples, per EPA/Department of Transportation (DOT) regulations and regulations specified in 49 CFR, Parts 171 through 179. The environmental samples will consist of potentially contaminated groundwater and soils. It is anticipated that the environmental samples that will be collected are likely to have low concentrations of contaminants and shall be handled as such for shipping purposes. Highly contaminated soil or groundwater (contaminated with high levels of organic) will be shipped as environmental samples using the procedures discussed below.

Environmental samples shall be shipped using the following steps:

1. Fill out the chain-of-custody record with relevant information.
2. Place the white original in a ziplock bag to travel with the samples. Tape the bag inside the sample cooler.
3. Cushion the bottom, sides and top of the cooler with bubble pack material.
4. Place bottles in cooler in such a way that they do not touch using bubble pack.
5. Pack coolers with ice in ziplock plastic bags.
6. Secure the cooler lid.
7. Place accompanying documentation (analytical request forms, etc.) in plastic bags and tape with masking or clear plastic tape to inside lid of cooler. Tape cooler drain shut.
8. Wrap cooler around complete circumference with strapping tape at two locations. Secure lid by taping. Do not cover current shipping or marking labels.
9. Affix custody seals on front right of cooler. Cover seals with wide, clear tape
10. Place lab address on top of cooler and ship samples via overnight carrier the same day that they are collected to the laboratory

5.0 FIELD QUALITY CONTROL/QUALITY ASSURANCE

5.1 Calibration of Field Equipment

Field equipment will be calibrated according to the manufacturer's recommended methods, as applicable. The following equipment will be calibrated daily:

- photoionization detector

Other field equipment will be calibrated prior to use and at such intervals as recommended by the manufacturer.

5.2 Preventative Maintenance of Field Equipment

Field equipment will be maintained and serviced according to the manufacturer's recommendations. Equipment will be cleaned on a regular basis and/or decontaminated according to manufacturer's recommendations and the Equipment Decontamination Plan detailed in Section 2.5 of the RIWP. A copy of the manufacturers' equipment operating manual for each piece of equipment will be kept at the on-site support vehicle.

6.0 CORRECTIVE ACTIONS

Corrective action is the process of identifying, recommending, approving, and implementing measures to counter unacceptable procedures or out-of-QC performance which can affect data quality. Corrective action can occur during field activities, laboratory analyses, data validation, and data assessment. All corrective actions proposed and implemented will be documented in the regular QA reports to management. Only after approval by the Project Manager or designee will corrective action be implemented.

For noncompliance problems, a formal corrective action program will be determined and implemented at the time the problem is identified. The person who identifies the problem is responsible for notifying the RI Project Chemist, who in turn will notify the Project Manager.

Any nonconformance with the established QC procedures in the QAPP will be identified and corrected in accordance with this QAPP. The RI Project chemist, or designee, will issue a nonconformance report for each nonconformance condition.

5.3 Field Corrective Action

Corrective action in the field may be needed when the sample network is changed (i.e., more/fewer samples, sampling locations other than those specified in the QAPP, etc.), sampling procedures and/or field analytical procedures require modification due to unexpected conditions, problems are identified during the data review and validation, etc. In general the Project Manager or project Geologist may identify the need for corrective action. The Project Manager, in consultation with NYSDEC, will recommend a corrective action. It will be the responsibility of the Project Manager to ensure the corrective action has been properly implemented. A copy of the corrective action documentation will be provided to the Project Chemist on the same day the corrective measure is implemented. This will enable the Project Chemist to include the corrective action in the project status report.

5.4 Laboratory Corrective Action

Corrective action in the laboratory may occur prior to, during, and after initial analysis. A number of conditions (such as broken sample containers, multiple phases, low/high pH readings, potentially high sample concentrations) may be identified during sample log-in or just prior to analysis. Following consultation with lab analysts and section leaders, it may be necessary for the RI Project Chemist to approve the implementation of corrective action. Depending on the condition encountered, the RI Project Chemist may consult the RI QA Officer for input. Conditions during or after analysis that may automatically trigger corrective action or optional procedures include dilution of samples, additional sample extract cleanup, automatic reinjection/reanalysis when certain QC criteria are not met, etc. A summary of method-specific corrective actions is available in the LQAP. All laboratory corrective actions will be documented and also identified in the case narrative of the data packages.

5.5 Corrective Action during Data Review / Validation and Assessment

The need for corrective action may be required during either the data validation or data assessment. Potential types of corrective action may include re-sampling by the field team or re-extraction/re-analysis of samples by the laboratory. These actions are dependent upon the ability to mobilize the field team, the existence of a sufficient amount of sample necessary for reanalysis (including whether or not the remaining sample satisfies holding time requirements), whether the data to be collected is necessary to meet the required QA objectives, etc. If the RI Data Validator identifies a corrective action situation, it is the Project Manager who will be responsible for approving the implementation of corrective action, including re-sampling, during data assessment. The Project Manager will document all corrective actions of this type.

5.6 Major Corrective Actions

Any corrective action that requires re-sampling or changes to the QAPP will be defined as a major corrective action. Major corrective actions include, but are not limited to, measures that change the number of samples collected, alter previously selected sampling locations, or impact the project QC objectives. The Project Manager will be responsible for contacting the NorDel II, LLC (client) and

NYSDEC to discuss all major corrective actions. The client and NYSDEC should approve major corrective actions before implementation by the Project Manager and field team.

7.0 DATA USABILITY SUMMARY REPORT (DUSR)

After the fieldwork is complete and the final analyses are completed, reviewed and validated, a Data Usability Summary Report (DUSR) will be prepared. The report will summarize the quality assurance, indicating any corrective actions taken and the overall results of QAPP compliance. The third party RI data validator will prepare this final summary in accordance with DER-10 requirements. The report will be utilized during the decision making-process and will be incorporated as part of the final report

TABLES

TABLE 1
PARCC DATA FOR AQUEOUS SAMPLES
WESTERN NEW YORK WORKFORCE TRAINING CENTER QAPP

MEASUREMENT PARAMETER	METHOD REFERENCE	LABORATORY PRECISION	FIELD & LABORATORY PRECISION	ACCURACY	COMPLETENESS (a)
TCL Volatile Organics	SW846 8260C	see Table 2	±50%	see Table 2	85%
TCL Semi-Volatile Organics	SW846 8270D	see Table 2	±50%	see Table 2	85%
TCL Pesticides/PCBs	SW846 8081C/8082A	see Table 2	±50%	see Table 2	85%
TAL Metals	SW846 6010C	see Table 2	±50%	see Table 2	85%
TAL Cyanide	EPA 335.4	see Table 2	±50%	see Table 2	85%
TAL Mercury	SW846 7470A	see Table 2	±50%	see Table 2	85%

NOTES:

(a) While the goal for completeness of laboratory measurements is 90%, the goal for total completeness (sampling and analytical) is 85%.

1. TCL = CLP Target Compound List; TAL = CLP Target Analyte List. See Table 5.
2. Precision expressed as either percent relative standard deviation (%RSD) or relative percent difference (%RPD).
3. Accuracy expressed as percent recovery of matrix spike or laboratory control sample.
4. Precision and accuracy for TCL/TAL parameters provided in Table 2.

TABLE 2
LABORATORY PRECISION AND ACCURACY CRITERIA FOR AQUEOUS TCL/TAL SAMPLES
WESTERN NEW YORK WORKFORCE TRAINING CENTER QAPP

VOLATILE ORGANICS:	QC LIMITS	
Target Spike Compound	**% Recovery**	**% RPD**
1,1-Dichloroethene	69%-140%	0%-20%
Trichloroethene	68%-150%	0%-14%
Benzene	78%-129%	0%-11%
Toluene	76%-125%	0%-13%
Chlorobenzene	80%-132%	0%-13%
Surrogate Compound		
Toluene-d8	81%-120%	Not Applicable
Bromofluorobenzene	76%-119%	Not Applicable
Dibromofluoromethane	85%-115%	Not Applicable
1,2-Dichloroethane-d4	72%-119%	Not Applicable
SEMI-VOLATILE ORGANICS:	**QC LIMITS**	
Target Spike Compound	**% Recovery**	**% RPD**
Phenol	18%-37%	0%-50%
2-Chlorophenol	45%-87%	0%-50%
N-Nitroso-di-n-propylamine	48%-96%	0%-50%
4-Chloro-3-methylphenol	39%-101%	0%-50%
Acenaphthene	56%-104%	0%-50%
4-Nitrophenol	20%-115%	0%-50%
2,4-Dinitrotoluene	57%-103%	0%-50%
Pentachlorophenol	20%-125%	0%-50%
Pyrene	50%-110%	0%-50%
Surrogate Compound		
Nitrobenzene-d5	35%-114%	Not Applicable
2-Fluorobiphenyl	43%-116%	Not Applicable
Terphenyl-d14	33%-141%	Not Applicable
Phenol-d6	10%-94%	Not Applicable
2-Fluorophenol	21%-110%	Not Applicable
2,4,6-Tribromophenol	10%-123%	Not Applicable
2-Chlorophenol-d4 (advisory)	33%-110%	Not Applicable
1,2-Dichlorobenzene-d4 (advisory)	16%-110%	Not Applicable
PESTICIDES:	**QC LIMITS**	
Target Spike Compound	**% Recovery**	**% RPD**
gamma-BHC	68%-136%	0%-15%
Heptachlor	77%-131%	0%-20%
Aldrin	71%-129%	0%-22%
Dieldrin	78%-134%	0%-18%
Endrin	70%-118%	0%-21%
4,4'-DDT	69%-139%	0%-27%
Surrogate Compound		
Tetrachloro-m-xylene	30%-150%	Not Applicable
Decachlorobiphenyl	30%-150%	Not Applicable
POLYCHLORINATED BIPHENYLS:	**QC LIMITS**	
Target Spike Compound	**% Recovery**	**% RPD**
Aroclor 1016	61%-148%	0%-20%
Aroclor 1260	60%-134%	0%-20%
Surrogate Compound		
Tetrachloro-m-xylene	40%-135%	Not Applicable
Decachlorobiphenyl	42%-133%	Not Applicable
TARGET ANALYTE LIST:	**QC LIMITS**	
Target Spike Compound	**% Recovery**	**% RPD**
Metals	75%-125%	±20%
Cyanide	75%-125%	±20%

NOTES:

1. VOC, SVOC, PCB and Pesticide accuracy and precision criteria based upon Chemtech established limits.
2. TAL accuracy and precison criteria based upon CLP SOW ILM04.0.
3. Precision criteria for metals is ±CRDL (reporting limit) for results less than 5xCRDL.

TABLE 3
PARCC DATA FOR SOIL SAMPLES
WESTERN NEW YORK WORKFORCE TRAINING CENTER QAPP

MEASUREMENT PARAMETER	METHOD REFERENCE	LABORATORY PRECISION	FIELD & LABORATORY PRECISION	ACCURACY	COMPLETENESS (a)
TCL Volatile Organics	SW846 8260C	see Table 4	±100%	see Table 4	85%
TCL Semi-Volatile Organics	SW846 8270D	see Table 4	±100%	see Table 4	85%
TCL Pesticides/PCBs	SW846 8081B/8082A	see Table 4	±100%	see Table 4	85%
TAL Metals	SW846 6010C	see Table 4	±100%	see Table 4	85%
TAL Cyanide	SW846 9012B	see Table 4	±100%	see Table 4	85%
TAL Mercury	SW846 7471B	see Table 4	±100%	see Table 4	85%
RCRA Metals	SW846 1311	see Table 4	±100%	see Table 4	85%
TCLP Metals	SW846 1311	see Table 4	±100%	see Table 4	85%
SPLP Metals	SW846 1312	see Table 4	±100%	see Table 4	85%

NOTES:

(a) While the goal for completeness of laboratory measurements is 90%, the goal for total completeness (sampling and analytical) is 85%.

1. TCL = CLP Target Compound List; TAL = CLP Target Analyte List. See Table 5.
2. Precision expressed as either percent relative standard deviation (%RSD) or relative percent difference (%RPD).
3. Accuracy expressed as percent recovery of matrix spike or laboratory control sample.
4. Precision and accuracy for TCL/TAL parameters provided in Table 4.

TABLE 4
LABORATORY PRECISION AND ACCURACY CRITERIA FOR SOIL TCL/TAL SAMPLES
WESTERN NEW YORK WORKFORCE TRAINING CENTER QAPP

VOLATILE ORGANICS:	**QC LIMITS**	
Target Spike Compound	**% Recovery**	**% RPD**
1,1-Dichloroethene	82%-154%	0%-20%
Trichloroethene	81%-128%	0%-24%
Benzene	83%-135%	0%-21%
Toluene	78%-140%	0%-21%
Chlorobenzene	80%-141%	0%-21%
Surrogate Compound		
Toluene-d8	75%-125%	Not Applicable
Bromofluorobenzene	75%-125%	Not Applicable
Dibromofluoromethane	75%-125%	Not Applicable
1,2-Dichloroethane-d4	75%-125%	Not Applicable
SEMI-VOLATILE ORGANICS:	**QC LIMITS**	
Target Spike Compound	**% Recovery**	**% RPD**
Phenol	20%-150%	0%-50%
2-Chlorophenol	52%-107%	0%-50%
N-Nitroso-di-n-propylamine	20%-150%	0%-50%
4-Chloro-3-methylphenol	60%-100%	0%-50%
Acenaphthene	65%-100%	0%-50%
4-Nitrophenol	45%-95%	0%-50%
2,4-Dinitrotoluene	56%-104%	0%-50%
Pentachlorophenol	20%-150%	0%-50%
Pyrene	20%-150%	0%-50%
Surrogate Compound		
Nitrobenzene-d5	23%-120%	Not Applicable
2-Fluorobiphenyl	30%-115%	Not Applicable
Terphenyl-d14	18%-137%	Not Applicable
Phenol-d6	24%-113%	Not Applicable
2-Fluorophenol	25%-121%	Not Applicable
2,4,6-Tribromophenol	19%-122%	Not Applicable
2-Chlorophenol-d4 (advisory)	20%-130%	Not Applicable
1,2-Dichlorobenzene-d4 (advisory)	20%-130%	Not Applicable
PESTICIDES:	**QC LIMITS**	
Target Spike Compound	**% Recovery**	**% RPD**
gamma-BHC	53%-125%	0%-50%
Heptachlor	56%-129%	0%-31%
Aldrin	50%-123%	0%-43%
Dieldrin	57%-138%	0%-38%
Endrin	54%-129%	0%-45%
4,4'-DDT	53%-184%	0%-50%
Surrogate Compound		
Tetrachloro-m-xylene	30%-150%	Not Applicable
Decachlorobiphenyl	30%-150%	Not Applicable
POLYCHLORINATED BIPHENYLS:	**QC LIMITS**	
Target Spike Compound	**% Recovery**	**% RPD**
Aroclor 1016	55%-128%	0%-20%
Aroclor 1260	58%-140%	0%-20%
Surrogate Compound		
Tetrachloro-m-xylene	69%-124%	Not Applicable
Decachlorobiphenyl	58-125%	Not Applicable
TAL/TCLP/SPLP:	**QC LIMITS**	
Target Spike Compound	**% Recovery**	**% RPD**
Metals	75%-125%	±20%
Cyanide	75%-125%	±20%

NOTES:

1. VOC, SVOC, PCB and Pesticide accuracy and precision criteria based upon Chemtech established limits.
2. TAL accuracy and precison criteria based upon CLP SOW ILM04.0.
3. Precision criteria for metals is ±CRDL (reporting limit) for results less than 5xCRDL.

TABLE 5
TARGET COMPOUNDS/REPORTING LIMITS
WESTERN NEW YORK WORKFORCE TRAINING CENTER QAPP

	CAS	Low Level	Low Level
Volatile Organics	Number	Water (µg/L)	Soil (µg/Kg)
Dichlorodifluoromethane	75-71-8	5.0	5.0
Chloromethane	74-87-3	5.0	5.0
Vinyl Chloride	75-01-4	2.0	5.0
Bromomethane	74-83-9	5.0	5.0
Chloroethane	75-00-3	5.0	5.0
Trichlorofluoromethane	75-69-4	5.0	5.0
1,1-Dichloroethene	75-35-4	5.0	5.0
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	5.0	5.0
Acetone	67-64-1	10.0	10.0
Carbon Disulfide	75-15-0	5.0	5.0
Methyl Acetate	79-20-9	5.0	5.0
Methylene chloride	75-09-2	5.0	5.0
trans -1,2-Dichloroethene	156-60-5	5.0	5.0
Methyl tert-Butyl Ether	1634-04-4	5.0	5.0
1,1-Dichloroethane	75-34-3	5.0	5.0
cis -1,2-Dichloroethene	156-59-2	5.0	5.0
2-Butanone	78-93-3	10.0	10.0
Bromochloromethane	74-97-5	5.0	5.0
Chloroform	67-66-3	5.0	5.0
1,1,1-Trichloroethane	71-55-6	5.0	5.0
Cyclohexane	110-82-7	5.0	5.0
Carbon tetrachloride	56-23-5	5.0	5.0
Benzene	71-43-2	5.0	5.0
1,2-Dichloroethane	107-06-2	1.0	5.0
Trichloroethane	79-01-6	5.0	5.0
Methylcyclohexane	108-87-2	5.0	5.0
1,2-Dichloropropane	78-87-5	5.0	5.0
Bromodichloromethane	75-27-4	5.0	5.0
cis -1,3-Dichloropropene	10061-01-5	1.0	5.0
4-methyl-2-pentanone	108-10-1	10.0	10.0
Toluene	108-88-3	5.0	5.0
Trans-1,3-Dichloropropene	10061-02-6	1.0	5.0
1,1,2-Trichloroethane	79-00-5	5.0	5.0
Tetrachloroethene	127-18-4	5.0	5.0
2-Hexanone	591-78-6	10.0	10.0
Dibromochloromethane	124-48-1	5.0	5.0
1,2-Dibromoethane	106-93-4	1.0	5.0
Chlorobenzene	108-90-7	5.0	5.0
Ethylbenzene	100-41-4	5.0	5.0
Xylenes (Total)	1330-20-7	5.0	5.0
Styrene	100-42-5	5.0	5.0
Bromoform	75-25-2	5.0	5.0
Isopropylbenzene	98-82-8	5.0	5.0
1,1,2,2-Tetrachloroethane	79-34-5	5.0	5.0
1,3-Dichlorobenzene	541-73-1	5.0	5.0
1,4-Dichlorobenzene	106-46-7	5.0	5.0
1,2-Dichlorobenzene	95-50-1	5.0	5.0
1,2-Dibromo-3-chloropropane	96-12-8	5.0	5.0

TABLE 5
TARGET COMPOUNDS/REPORTING LIMITS
WESTERN NEW YORK WORKFORCE TRAINING CENTER QAPP

	CAS	Low Level	Low Level
1,2,4-Trichlorobenzene	120-82-1	5.0	5.0
1,2,3-Trichlorobenzene	87-61-6	5.0	5.0

		Water	Low Level
Semivolatile Organics	CAS Number	(µg/L)	Soil (µg/Kg)
Benzaldehyde	100-52-7	5.0	170.0
Phenol	108-95-2	5.0	170.0
Bis -(2-chlorothyl) ether	111-44-4	5.0	170.0
2-Chlorophenol	95-57-8	5.0	170.0
2-Methylphenol	95-48-7	1.0	170.0
2,2'-Oxybis (1-chloropropane)	108-60-1	5.0	170.0
Acetophenone	98-86-2	5.0	170.0
4-Methylphenol	106-44-5	5.0	170.0
N-Nitroso-di-n-propylamine	621-64-7	5.0	170.0
Hexachloroethane	67-72-1	5.0	170.0
Nitrobenzene	98-95-3	1.0	170.0
Isophorone	78-59-1	5.0	170.0
2-Nitrophenol	88-75-5	1.0	170.0
2,4-Dimethylphenol	105-67-9	1.0	170.0
Bis (2-chloroethoxy) methane	111-91-1	5.0	170.0
2,4-Dichlorophenol	120-83-2	1.0	170.0
Naphthalene	91-20-3	5.0	170.0
4-Chloroaniline	106-47-8	5.0	170.0
Hexachlorobutadiene	87-68-3	5.0	170.0
Caprolactam	105-60-2	5.0	170.0
4-Chloro-3-methylphenol	59-50-7	1.0	170.0
2-Methylnaphthalene	91-57-6	5.0	170.0
Hexachlorocyclopentadiene	77-47-4	5.0	170.0
2,4,6-Trichlorophenol	88-06-2	1.0	170.0
2,4,5-Trichlorophenol	95-95-4	1.0	330.0
1,1'-Biphenyl	92-52-4	5.0	170.0
2-Chloronaphthalene	91-58-7	5.0	170.0
2-Nitroaniline4	88-74-4	10.0	330.0
Dimethylphthalate	131-11-3	5.0	170.0
2,6-Dinitrotoluene	606-20-2	5.0	170.0
Acenaphthylene	208-96-8	5.0	170.0
3-Nitroaniline4	99-09-2	10.0	330.0
Acenaphthene	83-32-9	5.0	170.0
2,4-Dinitrophenol4	51-28-5	1.0	330.0
4-Nitrophenol4	100-02-7	1.0	330.0
Dibenzofuran	132-64-9	5.0	170.0
2,4-Dinitrotoluene	121-14-2	5.0	170.0
Diethylphthalate	84-66-2	5.0	170.0
Fluorene	86-73-7	5.0	170.0
4-Chlorophenyl-phenyl ether	7005-72-3	5.0	170.0
4-Nitroaniline4	100-01-6	10.0	330.0
4,6-Dinitro-2-methylphenol	534-52-1	1.0	330.0
N-Nitrosodiphenylamine	86-30-6	5.0	170.0
1,2,4,5-Tetrachlorobenzene	95-34-3	5.0	170.0
4-Bromophenyl-phenylether	101-55-3	5.0	170.0
Hexachlorobenzene	100-52-7	0.5	170.0
Atrazine	108-95-2	5.0	170.0
Pentachlorophenol	111-44-4	1.0	170.0
Phenanthrene	95-57-8	5.0	170.0

TABLE 5
TARGET COMPOUNDS/REPORTING LIMITS
WESTERN NEW YORK WORKFORCE TRAINING CENTER QAPP

	CAS	Low Level	Low Level
Anthracene	95-48-7	5.0	170.0
Carbazole	108-60-1	5.0	170.0
Di-n-butylphthalate	98-86-2	5.0	170.0
Fluoroanthene	106-44-5	5.0	170.0
Pyrene	621-64-7	5.0	170.0
Butylbenzylphthalate	67-72-1	5.0	170.0
3,3'-Dichlorobenzidine	98-95-3	5.0	170.0
Benzo (a) anthracene	78-59-1	0.5	170.0
Chrysene	88-75-5	0.5	170.0
Bis (2-ethylhexyl) phthalate	105-67-9	5.0	170.0
Di-n-octylphthalate	111-91-1	5.0	170.0
Benzo (b) fluoranthene	120-83-2	0.5	170.0
Benzo (k) fluoranthene	91-20-3	0.5	170.0
Benzo (a) pyrene	106-47-8	0.5	170.0
Indeno (1,2,3-cd) pyrene	87-68-3	0.5	170.0
Benzo (a,h) anthracene	105-60-2	0.5	170.0
Benzo (g,h,i) perylene	59-50-7	5.0	170.0

Pesticides	CAS Number	Water (µg/L)	Solids (µg/Kg)
alpha-BHC	319-84-6	0.050	1.7
beta-BHC	319-85-7	0.050	1.7
delta-BHC	319-86-8	0.050	1.7
gamma-BHC (Lindane)	58-89-9	0.050	1.7
Heptachlor	76-44-8	0.050	1.7
Aldrin	309-00-2	0.050	1.7
Heptachlor epoxide2	1024-57-3	0.050	1.7
Endosulfan I	959-98-8	0.050	1.7
Dieldrin	60-57-1	0.10	3.3
4,4'-DDE	72-55-9	0.10	3.3
Endrin	72-20-8	0.10	3.3
Endosulfan II	33213-65-9	0.10	3.3
4,4'-DDD	72-54-8	0.10	3.3
Endosulfan sulfate	1031-07-8	0.10	3.3
4,4'-DDT	50-29-3	0.10	3.3
Methoxychlor	72-43-5	0.10	3.3
Endrin ketone	53494-70-5	0.10	3.3
Endrin aldehyde	7421-93-4	0.10	3.3

TABLE 5
TARGET COMPOUNDS/REPORTING LIMITS
WESTERN NEW YORK WORKFORCE TRAINING CENTER QAPP

	CAS	Low Level	Low Level
alpha-Chlordane	5103-71-9	0.050	1.7
gamma-Chlordane	5103-74-2	0.050	1.7
Toxaphene	8001-35-2	5.0	34.0

PCBs	CAS Number	Water (µg/L)	Solids (µg/Kg)
Arochlor-1016	12674-11-2	0.5	33
Arochlor-1221	11104-28-2	0.5	33
Arochlor-1232	11141-16-5	0.5	33
Arochlor-1242	53469-21-9	0.5	33
Arochlor-1248	12672-29-6	0.5	33
Arochlor-1254	11097-69-1	0.5	33
Arochlor-1260	11096-82-5	0.5	33
Arochlor-1262	37324-23-5	0.5	33
Arochlor-1268	11100-14-4	0.5	33

Inorganics	CAS Number	Water (µg/L)	Solids (mg/kg)
Aluminum	7429-90-5	200	40
Antimony	7440-36-0	60	12
Arsenic	7440-38-2	15	3
Barium	7440-39-3	200	40
Beryllium	7440-41-7	5	1
Cadmium	7440-43-9	5	1
Calcium	7440-70-2	5000	1000
Chromium	7440-47-3	10	2
Cobalt	7440-48-4	50	10
Copper	7440-50-8	25	5
Iron	7439-89-6	100	20
Lead	7439-92-1	10	2
Magnesium	7439-95-4	5000	1000
Manganese	7439-96-5	15	3
Mercury	7439-97-6	0.2	0.1
Nickel	7440-02-0	40	8
Potassium	7440-09-7	5000	1000
Selenium	7782-49-2	35	7
Silver	7440-22-4	10	2
Sodium	7440-23-5	5000	1000
Thallium	7440-28-0	25	5
Vanadium	7440-62-2	50	10
Zinc	7440-66-6	60	12
Cyanide	57-12-5	10	1

TABLE 6
ANALYTICAL METHODS, SAMPLE CONTAINERS, PRESERVATION AND ANALYTICAL HOLD TIMES FOR AQUEOUS SAMPLES
WESTERN NEW YORK WORKFORCE TRAINING CENTER QAPP

PARAMETER	METHODOLOGY	CONTAINER	MINIMUM SAMPLE	PRESERVATION [1]	HOLD TIME [2]
TCL Volatile Organics	SW846 8260C	3-40 ml G	2 - 40 ml	Cool 4 ^{o}C;HCl,pH<2	14 days [3]
TCL Semi-Volatile Organics	SW846 8270D	2-1000ml G	1000ml	Cool 4^{o} C	7 days [4]
TCL Pesticides/PCBs	SW846 8081B/8082A	2-1000ml G	1000ml	Cool 4^{o} C	7 days [4]
TAL Metals	SW846 6010C	1-500 ml P	250 ml	Cool 4^{o} C; HNO_3, pH<2	180 days [5]
TAL Cyanide	EPA 335.4	1-500ml G	50ml	Cool 4^{o} C; NaOH, pH>12	14 days
TAL Mercury	SW846 7470A	1-250ml P	200ml	Cool 4^{o} C; HNO_3, pH<2	28 days

Notes:

1. Sample preservation is performed by sampler immediately upon sample collection.
2. Hold time based upon day of sample collection not Verified Time of Sample Receipt.
3. If sample cannot be preserved due to foaming, unpreserved sample will be analyzed within 7 days.
4. Hold time is 7 days until start of sample extraction, 40 days following extraction for analysis.
5. Hold Time for metals is 180 days, except for Mercury which is 28 days.

P indicates that a Plastic bottle should be used.
G indicates that a Glass bottle should be used.

TABLE 7
ANALYTICAL METHODS, SAMPLE CONTAINERS, PRESERVATION AND ANALYTICAL HOLD TIMES FOR SOIL SAMPLES
WESTERN NEW YORK WORKFORCE TRAINING QAPP

PARAMETER	METHODOLOGY	CONTAINER	MINIMUM SAMPLE	PRESERVATION (1)	HOLD TIME (2)
TCL Volatile Organics	SW846 8260C	4 EnCore samplers or 2 oz G	15 gm	Cool 4 ^{o}C	14 days (3)
TCL Semi-Volatile Organics	SW846 8270D	4 oz G	30 gm	Cool 4 ^{o}C	14 days (4)
TCL Pesticides/PCBs	SW846 8081B/8082A	4 oz G	30 gm	Cool 4 ^{o}C	14 days (4)
TAL Metals (incl. Mercury)	SW846 6010C/7471B	4 oz G	30 gm	Cool 4 ^{o}C	180 days (5)
TAL Cyanide	SW846 9012B	4 oz G	30 gm	Cool 4 ^{o}C	14 days
RCRA Metals	SW846 1311/6010C	8 oz G	150 gm	Cool 4 oC	180 days (5)
TCLP Metals	SW846 1311/6010C	8 oz G	150 gm	Cool 4 oC	180 days (5)
SPLP Metals	SW846 1312/6010C	8 oz G	150 gm	Cool 4 oC	180 days (5)

Notes:

1. Sample Preservation is performed by sampler immediately upon sample collection except for VOCs which is performed by laboratory upon receipt (see Note 3).
2. Hold time based upon day of sample collection not Verified Time of Sample Receipt.
3. Hold time is 48 hours to lab prep for EnCore samplers and then 14 days to analysis.
4. Hold Time for SVOCs, Pesticides/PCBs is 14 days for extraction and 40 days for analysis.
5. Hold Time for metals is 180 days, except for Mercury which is 28 days.

G indicates that a Glass bottle should be used.

TABLE 8
FIELD AND LABORATORY CONTROL SAMPLES
WESTERN NEW YORK WORKFORCE TRAINING CENTER QAPP

Sample Type	Matrix	Estimated Number of Samples
Soil samples		
Soil Boring	Soil	48
Rinsate Blank - split spoons	Water	1 per 20
Trip Blank	Water	1 per day* (VOCs only)
Matrix Spike	Soil	1 per 20
Matrix Spike Duplicate	Soil	1 per 20
Duplicate	Soil	1 per 20
Surface Soil	Soil	4
Rinsate Blank	Water	1 per 20
Trip Blank	Water	1 per day* (VOCs only)
Matrix Spike	Soil	1 per 20
Matrix Spike Duplicate	Soil	1 per 20
Duplicate	Soil	1 per 20
Groundwater samples		
Groundwater samples	Water	6
Rinsate Blank	Water	1 per 20
Trip Blank	Water	1 per day* (VOCs only)
Matrix Spike	Water	1 per 20
Matrix Spike Duplicate	Water	1 per 20
Duplicate	Water	1 per 20

* One trip blank to be included with each shipment of VOC samples.

ATTACHMENT 5

Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) – ON CD

SITE SPECIFIC HEALTH AND SAFETY PLAN
for the

Western New York Workforce Training Center

683 Northland Avenue

Buffalo, New York

Prepared for:

NorDel II, LLC

Prepared by:

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, NY 14209

December, 2016

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APPENDICES

1.0 INTRODUCTION

The purpose of this Health and Safety Plan (HASP) is to set forth in an orderly and logical fashion, appropriate health and safety procedures to be followed by LiRo Engineers, Inc. (LiRo) employees during onsite investigative activities throughout the Western New York Workforce Training Center Site Investigation. The site investigation work at the site will include:

- Surface Soil Investigation
- Subsurface Soil Investigation
- Groundwater Investigation
- Soil/Subslab Vapor Investigation

This document will serve not only to explain the chemical and physical hazards associated with working on the site, but will also outline approved measures for dealing with such hazards.

The procedures presented in this plan comply with the following regulatory or guidance documents:

- New York State Labor Law, Paragraph 906, Part 56 (Code Rule 56).
- USEPA National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 61, Subpart M.
- OSHA Asbestos Construction Standard, 29 CFR 1926.1101.
- OSHA Occupational Safety and Health Regulations, 29 CFR 1910/1926, U.S. Department of Labor, Occupational Safety and Health Administration, OSHA, March 6, 1990.
- OSHA Occupational Safety and Health Standards for Emergency Action Plan (Means of Egress), 29 CFR 1910.38.
- OSHA Occupational Safety and Health Standards, 29 CFR 1910.120.
- USEPA Order 1440.2, Health and Safety Requirements for Employees Engaged in Field Activities, July 12, 1981.
- NIOSH/OSHA/USEPA, Occupational Safety and Health Guidance manual for Hazardous Waste Site Activities, October 1985.
- Standard Operating Safety Guides, United States Environmental Protection Agency, Office of Emergency and Remedial Response, November 1984.
- LiRo Corporate Health and Safety Manual.

The project Health and Safety Officer (HSO) will be responsible for the development and

implementation of project Health and Safety protocols. All personnel involved in onsite activities under this Health and Safety Plan will be required to follow the HASP protocols, as directed by the Site Health and Safety Officer (HSO). In addition, any subcontractor(s) will be required to designate a Site HSO for their personnel and to follow, at a minimum, the requirements of this HASP.

The Site HSO reports directly to the Project HSO. LiRo will designate a qualified backup for the site HSO prior to the initiation of onsite activities. The Site HSO can also be one of the project field engineers or geologists. Field Activity Forms to be used by the site HSO to document Health and Safety Program requirements are provided in Appendix A.

All personnel who will be involved with sampling onsite must have completed the appropriate waste site worker training as required by OSHA 1910.120(e)(2), 1910.120(e)(3), and 1910.120(e)(8), as applicable, and the required medical surveillance as required by OSHA 1910.120(f).

2.0 RESPONSIBILITIES

The following is a summary of the health and safety responsibilities of various project personnel.

2.1 Project Health and Safety Officer

The responsibilities of the Project Health and Safety Officer (HSO) are to develop and coordinate the Site Health and Safety Program and provide necessary direction and supervision to the Site HSO. He will identify the most direct route to the closest hospital. The Project HSO will review and confirm changes in personal protection requirements when site conditions are found to be different than those originally anticipated.

The Project HSO will be involved in all discussions on health and safety matters with the Occupational Safety and Health Administration (OSHA), local health authorities, or other governmental or labor representatives. In addition, this individual will provide the Site HSO with details concerning the task-specific health and safety considerations. The Project HSO reports directly to the project Manager. LiRo will designate a qualified backup for the Project HSO prior to the initiation of onsite activities.

2.2 Site Health and Safety Officer

The responsibilities of the Site HSO are as follows:

- Implement this HASP onsite
- Enforce day-to-day health and safety protocols in effect onsite
- Require that all personnel entering the site understand the provisions of this HASP
- Conduct periodic training sessions in proper use and maintenance of personal

protective equipment and safety practices
- Conduct periodic emergency response drills
- Conduct daily health and safety meetings each morning
- Direct and advise onsite LiRo personnel, visitors, and subcontractor(s) HSO(s) on all aspects, especially changes, related to health and safety requirements at the site
- Conduct necessary health and safety monitoring
- Administer air monitoring program
- Monitor site conditions and determine all necessary changes in levels of personal protection and, if warranted, execute work stoppages
- Report changes in site conditions and changes in personal protection equipment requirements to the Project HSO
- Prepare accident/incident reports

The Site HSO reports directly to the Project HSO. LiRo will designate a qualified backup for the Site HSO prior to the initiation of onsite activities.

2.3 Key Personnel

Personnel responsible for implementation of this Health and Safety Plan are:

Name	Title	Address	Contact Numbers
Stephen Frank	Project Coordinator	690 Delaware Avenue Buffalo, NY 14209	Phone: 716-882-5476 Cell: 716-704-1016
Michael Byrnes, CIH	Project Health and Safety Officer	15-09 132nd St. 2nd Floor College Point, NY 11356	Phone: 718-886-7998 Cell: 917-833-3028
Jason Colvin	Site Health and Safety Officer	690 Delaware Avenue Buffalo, NY 14209	Phone: 716-882-5476 Cell: 716-949-9797

3.0 PROJECT BACKGROUND

LiRo Engineers, Inc. (LiRo) is in contract agreement with NorDel II, LLC to complete a Site Investigation (SI) at the Western New York Workforce Training Center Site located at 683 Northland Avenue in the City of Buffalo, Erie County, New York. NorDel II, LLC is requesting acceptance of the Western New York Workforce Training Center Site into the Brownfield Site Cleanup Program (BCP).

In support of the SI, LiRo has developed an investigation of site surface soil, subsurface soil, and groundwater. Anticipated work for the site investigation will include:

- 25 soil borings will be installed in the southwest portion of the Site. Each soil boring will be advanced to the top of bedrock and will be used collect surface and subsurface soil samples.
- 6 groundwater monitoring wells will be installed at the site for the collection of

groundwater samples and to determine groundwater flow direction.

- In order to characterize soil vapor at the site, 6 soil vapor samples will be collected, 4 beneath the buildings floor slab and gravel sub-base and two locations outside of the building.

Site Background

The Site is located at 683 Northland Avenue in the City of Buffalo, New York (Figure 1) on approximately 7.25 acres of land. The Site elevation along Niagara Street (eastern side of the Site) is approximately 645 feet above sea level, and the Site slopes to the southwest. The site is developed with an approximately 235,000 square foot factory building complex which comprises a four story office area on the north side along Northland Avenue, a series of connecting ten manufacturing spaces, and a detached one story shed located on the west side of the facility.

The Site is located in an urban setting, with residential properties along Northland Avenue north of the site, and commercial/industrial properties along Northland Avenue to the east and west of the site. The site is bordered to the south by the New York Central Railroad.

The Site was formerly operated as a machine and tool works facility from approximately 1910. The Site was originally developed by the Niagara Machine and Tool Company and later by the Clearing Niagara Company. It was most recently used for miscellaneous storage but is now vacant and awaiting re-use.

4.0 TRAINING REQUIREMENTS

All personnel conducting field activities are required to be certified in health and safety practices for hazardous waste operations as specified in the Federal OSHA Regulations (29 CFR 1910.120) (revised March 6, 1990). Paragraph (e) (2) of the above referenced regulations requires that each employee, at the time of job assignment, receive a minimum of 40 hours of initial instruction off the site, and a minimum of three days of supervised field experience.

Paragraph (e) (3) of the above referenced regulations requires that all onsite management and supervisory personnel directly responsible for or who supervise employees engaged in hazardous waste operations, must initially receive eight hours training which must emphasize health and safety practices related to managing hazardous waste work.

Paragraph (e) (8) of the above referenced regulations requires that workers and supervisors must receive eight hours of refresher training annually on the items specified in Paragraph (e) (1)

and/or (e) (3).

Additionally, all personnel must receive adequate site-specific training, in the form of an Onsite Health and Safety Briefing given by the Project HSO prior to participating in onsite field work, which will involve a review of this Health and Safety Plan with emphasis on the following:

- Protection of the adjacent community from hazardous vapors/dust which may be released during site activities.
- Attention to health effects and hazards of substances known to be present onsite.
- Hazards and protection against heat/cold.
- The need for vigilance in personal protection, and the importance of attention to proper use, fit and care of personal protective equipment.
- The effectiveness and limitations of personal protective equipment.
- Prescribed decontamination procedures.
- Site control, including work zones, access, and security.
- The proper observance of daily health and safety practices, such as the entry and exit of work zones and site, proper hygiene during lunch, break, etc.
- Recognition in oneself or in others of physical conditions requiring immediate medical attention, and application of simple first aid measures, and
- Emergency procedures to be followed (with rehearsals) in cases of fire, explosion, or sudden release of hazardous gases.

Health and Safety Meetings will be conducted daily by the Site HSO and will cover protective clothing and other equipment to be used that day, potential chemical and physical hazards, emergency procedures, and conditions and activities from the previous day.

5.0 MEDICAL SURVEILLANCE REQUIREMENTS

All LiRo personnel who engage in waste site activities for 30 days or more per year participate in the Medical Surveillance Program. All project personnel involved in onsite activities in the Contamination Reduction/Exclusion Zones at the site will be required to undergo annual medical examinations. This examination must take place not more than one year prior to and one year after the completion of site work and must be conducted by a physician who is board-certified in occupational medicine. The physician will have been made familiar with the job-related duties of each worker examined.

6.0 SITE HAZARD EVALUATION

6.1 Chemical Hazards

Health/safety characteristics and exposure limits of contaminants known or suspected at the site are listed in Table 6-1. The risk of exposure can be by the dermal or respiratory route, depending on the type of compound and intrusive activity being conducted.

6.2 Physical Hazards

Physical hazards include the dangers of tripping and falling on uneven ground, operation of heavy equipment such a drilling rig, vehicular traffic, and utilities either above-ground or buried. The following are physical hazards that may be encountered during investigation activities.

6.2.1 Tripping Hazards - An area of risk associated with onsite investigative activities is presented by uneven ground, debris, or equipment which may be present at the site thereby creating a potential tripping hazard.

6.2.2 Climbing Hazards - During site activities, workers may have to work on drilling equipment by climbing the mast. The drilling contractor will conform with any applicable NIOSH and OSHA requirements for climbing activities. These activities will be overseen by the LiRo Site HSO.

6.2.3 Cuts and Lacerations - Field activities at this site may involve contact with buried debris or various types of machinery. At least one person onsite must be currently certified in first aid and CPR. Personnel trained and certified in first aid should be prepared to take care of cuts and bruises as well as other minor injuries. A first aid kit approved by the American Red Cross will be available during all field activities.

6.2.4 Lifting Hazards - Improper lifting by workers is one of the leading causes of industrial injuries. Field workers may be required to lift heavy objects. Therefore, all members of the field crew should be trained in the proper methods of lifting heavy objects. All workers should be cautious against lifting objects too heavy for one person.

6.2.5 Utility Hazards - Before conducting any intrusive work, LiRo will be responsible for locating and verifying all existing utilities at the location of each boring.

6.2.6 Traffic Hazards – It is anticipated that all site work will be conducted away from any roadway areas. In the event that is not the case, all traffic, vehicular and pedestrian, shall be maintained and protected at all times consistent with local, state, and federal agency regulations regarding such traffic.

The drilling contractor shall carry on his operations without undue interference or delays to traffic. The contractor shall furnish all labor, materials, watchmen, barricades, signs, lights, and anything else necessary to maintain traffic and to protect his work and the public during operations. All lane and shoulder closings shall follow the procedures outlined in the Manual on Uniform

Traffic Control Devices, 1986, and the Traffic Control Device Handbook, 1983.

If any significant changes to the above mentioned hazards become apparent, information in the HASP will be updated and any changes in PPE will be evaluated.

6.3 Heat Stress

The combination of high ambient temperature, high humidity, physical exertion, and personal protective apparel which limits the dissipation of body heat and moisture can cause heat stress. The Site HSO is responsible for monitoring heat stress in the field team personnel.

It should be noted that during hazardous waste site work, the use of chemical protective clothing (CPC) can compromise the evaporative cooling from sweat. Personal cooling devices may be effective in protecting workers wearing CPC. NIOSH recommends physiological measurements of oral temperature or pulse rate with the use of total encapsulating clothing levels (Level A protection).

The following prevention, recognition, and treatment strategies will be implemented to protect personnel from heat stress. Personnel will be trained to recognize the symptoms of heat stress, and to apply the appropriate treatment.

1. Prevention

   a. Provide plenty of liquids. Available in the Support Zone will be a 50% solution of fruit punch or the like in water, or plain water to be taken with salted foods such as pretzels.

   b. Work in pairs. No individual will attempt to undertake any activity alone.

   c. Provide cooling devices. A spray hose and a source of water will be provided to reduce body temperature, cool protective clothing, and/or act as a quick-drench shower in case of an exposure incident.

   d. Adjustment of the work schedule. As is practicable, the most labor intensive tasks should be carried out during the coolest part of the day.

2. Recognition and Treatment

Any person who observes any of the following forms of heat stress, either in himself or in another worker, will report this information to the Site HSO as soon as possible.

   a. Heat Rash (or prickly heat):

      Cause: Continuous exposure to hot and humid air, aggravated by chafing clothing.

Symptoms: Eruption of red pimples around sweat ducts accompanied by intense itching and tingling.

Treatment: Remove source of irritation and cool skin with water or wet cloths.

b. Heat Cramps (or heat prostration):

Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.

Symptoms: Sudden development of pain and/or muscle spasms in the abdominal region.

Treatment: Remove the worker to the Contamination Reduction Zone. Provide fluids orally. Remove protective clothing. Decrease body temperatures and allow a period of rest in cool location.

c. Heat Exhaustion

Cause: Overexertion in a hot environment and profuse perspiration accompanied by inadequate replenishment of body water and electrolytes. A serious condition.

Symptoms: Muscular weakness, staggering gait, nausea, dizziness, shallow breathing, pale and clammy skin, approximately normal body temperature.

Treatment: Perform the following while simultaneously making arrangements for transport to a medical facility:
Remove the worker to the Contamination Reduction Zone. Remove protective clothing. Lie the worker down on his or her back, in a cool place, and raise the feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of a salt water solution, using one teaspoon of salt in 12 ounces of water. Transport the worker to a medical facility.

d. Heat Stroke

Cause: Same as heat exhaustion. An extremely serious condition.

Symptoms: Dry and hot skin, dry mouth, dizziness, nausea, headache, rapid pulse.

Treatment: Cool worker immediately by immersing or spraying with

cool water or sponge bare skin after removing protective clothing. Transport to hospital.

6.4 Cold Exposure

Exposure to cold weather, wet conditions and extreme wind-chill factors may result in excessive loss of body heat (hypothermia) and/or frost bite. To guard against cold exposure and to prevent cold injuries, appropriate warm clothing should be worn, warm shelter must be readily available, rest periods should be adjusted as needed, and the physical conditions of onsite field personnel should be closely monitored. Personnel and supervisors working onsite will be made aware of the signs and symptoms of frost bite and hypothermia such as shivering, reduced blood pressure, reduced coordination, drowsiness, impaired judgment, fatigue, pupils dilated but reactive to light, and numbing of the toes and fingers. The potential for wetting of protective clothing should be of concern, since wet clothing (from sweat or splashes) will provide poor insulation against the cold.

7.0 SITE CONTROL

In order to keep unauthorized personnel from entering the work areas during subsurface soil sampling activities without proper protective equipment, and for good control of overall site safety, two work zones will be established for intrusive activities. The two work zones are the Support Zone and the Contamination Reduction Zone/Exclusion Zone. Actual zone width will be determined by optimal size of work area and by local obstructions. A brief description of the site work zones follows.

7.1 Support Zone

The Support Zone at the site will be a mobile unit (automobile) including a cellular telephone for communication. The Support Zone will be located as near as practicable to the active work areas and decontamination areas.

7.2 Contamination Reduction Zone/Exclusion Zone

Due to the environmental setting for this project, the Contamination Reduction Zone (CRZ) and Exclusion Zone (EZ) will be incorporated into one zone at each active soil boring location. This zone will be mobile and the location will be dependent upon where the active work is located. The decontamination of personnel, light equipment, and heavy equipment will be performed as described in Section 11.

7.3 Temporary Storage Facilities

A temporary storage location will be established at the site for the storage of any decontamination water and disposable clothing. The facility will be situated away from vehicular and pedestrian traffic.

7.4 Site Visitation

It is possible that officials from the City of Buffalo and regulating bodies with jurisdiction will visit the site during operations. It is also possible that an OSHA representative will wish to inspect the site. All such officials must meet the same requirements of onsite workers (40 hour OSHA-approved training, site-specific training, and medical surveillance) before going into any active Contamination Reduction Zone/Exclusion Zone. Visitors other than City of Buffalo, NYSDEC or OSHA representatives will be subject to the additional requirements of having to receive written permission from the City of Buffalo to conduct a site visit. Because of the nature of the work, the work zone will be continually supervised. Signs will be used to prevent the entrance of unauthorized visitors.

All visitors must supply their own personal protective equipment.

8.0 PERSONAL PROTECTION

Based on known site contaminant levels, work at the site is planned to begin in Level D personal protective equipment. However, since unexpected levels of hazardous materials may become evident, various levels of protection will be available during most excavating, drilling and sampling activities. Components of all levels of personal protection that will be available are listed in Table 8-1. Planned levels of protection for various activities are given in Table 8-2.

In the event that unexpected levels of organic vapors are encountered, any personnel working at Level D or D+ protection, will don their respirators at once (change to Level C) per the monitoring criteria detailed in Section 9.0. The Site HSO will consult with the Project HSO to decide if and when Level D+ protection may be resumed, or if a higher level of personal protection is required.

Some modification in safety equipment may be implemented in order to balance concerns for full contaminant protection against concerns for the possibility of heat stress resulting from the need to wear more restrictive protective equipment. Such modifications may be implemented only if approved in advance by the Site HSO, following consultation with the Project HSO. Protective equipment which fully complies with the requirements of all required levels of protection will be immediately available at all times on the site.

Level C respiratory protection will normally be provided using NIOSH-approved full-face respirators, with P100 combination filter cartridges approved for removal of organic vapors, particulate, gases, and fumes. The HEPA filter cartridges will be changed at the end of each work day or when breakthrough occurs, whichever comes first. All team members will be fit-tested for respirators. Due to difficulties in achieving a proper seal between face and mask, persons with facial hair will not be allowed to work in areas requiring respiratory protection. LiRo's complete respiratory protection program requirements for the project are included in Appendix C.

For the fullest protection of site personnel, the supervising field engineer/geologist will conduct organic vapor monitoring at closely spaced intervals during soil excavation and drilling activities. Monitoring will be accomplished by real-time monitoring equipment. The primary

purpose of this monitoring will be to assess the adequacy of respiratory protection and to make it possible to stop work quickly if hazardous gases are encountered. The air monitoring to be carried out during intrusive activities is summarized in Section 9.

On a daily basis, dust control will be visually monitored by the supervising field engineer/geologist continuously throughout the workday. Water spraying or misting will be used to control dust levels associated with soil excavations and borings. Spraying water shall be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor shall have sufficient suitable equipment on the job to accomplish this. Should visible dust emissions become evident, the supervising engineer/geologist will inform the Contractor immediately to implement corrective measures and/or to cease operations in order to re-evaluate dust suppression methods.

9.0 AIR MONITORING

Air monitoring will be performed throughout the drilling programs by trained LiRo personnel. While intrusive activities are in progress, monitoring frequencies will be as summarized in Table 9-1. Air monitoring equipment will be calibrated daily and all data will be recorded in the field notebook and transferred to Instrument Reading Logs (Appendix B). Each day, intrusive work will not begin until the instruments are calibrated and background levels are taken and recorded. All air monitoring results will be recorded in the field notebook and will be transferred to Instrument Reading Logs.

Current project work plans do not require the disturbance of asbestos. However, if asbestos abatement is necessary during the scope of this project, all applicable notifications will be made in accordance with NYSDOL regulations and asbestos air monitoring will be performed using stationary air monitoring equipment in accordance with NYSDOL regulations.

9.1 Total Volatiles

During intrusive activities, air monitoring for total volatiles (organic vapors) will be performed using a photoionization detector (MiniRae 2000, or equivalent) equipped with the standard probe which contains a 10.6 eV lamp. When readings less than 5 ppm above background in the breathing zone are observed consistently, monitoring will take place at least every 10 minutes or for every sample retrieved. If readings from 5-25 ppm above background in the breathing zone are observed, and all other air monitoring action levels indicate that drilling can proceed, monitoring will take place continuously. If organic vapor readings continue to exceed 25 ppm above background in the breathing zone, or other instrument readings continue to necessitate work suspension, intrusive activities will be halted and the level of protection used by onsite personnel will be reassessed.

9.2 Work Stoppage Responses

The following responses will be initiated whenever one or more of the action levels necessitating a work stoppage is exceeded:

(1) The Site HSO will be consulted immediately.
(2) All personnel (except as necessary for continued monitoring and contaminant mitigation, if applicable) will be cleared from the work area (e.g. from within the Exclusion Zone).
(3) Monitoring will be continued until intrusive work resumes or the excavation is backfilled.
(4) If applicable, all containment structure will be sealed and negative air filtration units will be maintained in their operational condition. Engineering controls and work practices will be instituted to reduce the airborne concentration of the above stated contaminants.

Any chemical release to air, water, or soil must be reported to the Site HSO at once. Any exposure resulting from protective equipment failure must be immediately reported to the Site HSO and to the Project HSO in writing within 24 hours.

9.3 Calibration of Air Monitoring Instruments

A. Photoionization Detector: The photoionization detector will be calibrated to an isobutylene surrogate daily (prior to field activities) and the results will be recorded in the field log book and transferred to Instrument Reading logs.

10.0 HANDLING OF SAMPLES

The collection and analysis of samples will require caution, not only to ensure safety of site sampling and support personnel, but also to ensure accuracy of results. To minimize hazards to lab personnel, sample volumes will be no larger than necessary, and the outside of all sample containers will be wiped clean prior to shipment.

In order to preserve sample integrity and to prevent contamination escape, packaging of samples shall follow appropriate protocols. All samples will be placed in a sealed shipping container prior to shipment.

11.0 DECONTAMINATION PROCEDURES

11.1 Decontamination of Personnel

Decontamination of personnel will be performed at each Contamination Reduction Zone/Exclusion Zone. This can be accomplished by washing and rinsing outer gloves and outer boots over a completed excavation. Disposable clothing can then be removed and discarded into a trash can with a plastic liner. If personnel are in Level C protection, the above procedures will be followed and the respirator will be removed, sanitized, and placed in a plastic bag.

Decontamination procedures for various levels of personnel protection are provided in Appendix D.

11.2 Decontamination of Equipment

11.2.1 Light Equipment - Decontamination of light equipment (such as tools, containers, monitoring instruments, radios, clipboards, etc.) will be accomplished by wiping equipment off with clean, damp cloths. The cloths can be discarded in the trash can with the disposable clothing.

11.2.2 Heavy Equipment - Decontamination of large sampling equipment (i.e, drill rig) will be carried out as follows. At boring locations showing no evidence of contamination, the excavator drilling equipment will be dry-brushed to remove residual soil prior to proceeding to the next boring location. At locations showing evidence of minor contamination, the drilling equipment will first be dry brushed and then cleaned (over the boring location) using a portable power washer. If heavily contaminated soil (i.e., oily or very odiferous) is observed, the drill equipment will be mobilized to the existing onsite decontamination pad and steam cleaned at that location.

12.0 EMERGENCY PROCEDURES

The most likely incidents for which emergency measures might be required are:

a sudden release of hazardous gases/vapors during intrusive work
an explosion or fire occurring during intrusive work, or
a heavy equipment-related accident, or other accident resulting in personal injury

Emergency procedures established to respond to these incidents are covered under the sections that follow.

12.1 Communications

A cellular telephone will be maintained by the Site HSO (Phone # 716-949-9797).

12.2 Escape Routes

Flagging will be positioned near the excavator to indicate wind direction. In the event of a sudden release of hazardous gases or a fire, all personnel will be required to move upwind or at 90 degrees away from the location of the release or fire. This may require personnel to move from the Exclusion Zone directly into an offsite area without proper decontamination. At the conclusion of the emergency, they should move to the Contamination Reduction Zone for proper decontamination.

12.3 Evacuation Signal

In the event of a sudden release or fire requiring immediate evacuation of the site, three quick blasts will be sounded on an air horn. Sounding the air horn will be the responsibility of the excavator operator or the site HSO. The horn will be kept in a conspicuous place for quick access

by personnel at the borehole. The Project Manager, the City of Buffalo, and the Project Health and Safety Officer will be notified by telephone, and later by written report whenever a site evacuation is executed.

12.4 Fire/Explosion

It will be the responsibility of the excavator or drill rig operator to have a fire extinguisher available at the active work location. The operator will have further responsibility of taking fire prevention measures such as the continuous removal from the rig of accumulated oil, grease, or other combustible materials. In the event of an excavator/drill rig fire or other fire that cannot be controlled with available equipment, or in the event of an explosion, the local fire department will be summoned immediately by the Site HSO, who shall apprise them of the situation upon their arrival. The City of Buffalo will also be notified.

12.5 First Aid

First aid for personal injuries will be administered by the Site HSO. If a site worker should require further treatment, he will be transported to the hospital in a vehicle maintained onsite for this purpose, or an ambulance will be summoned. The onsite vehicle will carry written direction to the hospital as well as a map showing the route.

All accidents, however insignificant, will be reported to the Site HSO. Personnel designated to administer first aid will have received a minimum of eight hours training in first aid and CPR, and be certified by the American Red Cross.

12.6 Emergency Assistance

The following list of names, telephone numbers, and location of police, fire, hospital, and other agencies whose services might be required, or from whom information might be needed, will be carried in the onsite vehicle.

Erie County Medical Center, 462 Grider Street, Buffalo, NY, 716-898-3000
Fire Department: 911
Police Department: 911
Poison Control Center: 219 Bryant Street, Buffalo, NY, 716-878-7654
NYSDEC Emergency Hotline: 1-800-457-7362

The route to the hospital (shown on Figure 12-1) is as follows:

Go east on Northland Avenue (0.3 miles).
Turn left (north) onto Grider Street (0.6 miles).
Hospital is on the left immediately after East Delevan Avenue.

If an ambulance should have to be called to the site, the injured person should meet the

ambulance outside the CRZ/Exclusion Zone if possible. If a head or spinal injury is suspected and the person is unconscious, medical personnel may have to come into the CRZ/Exclusion Zone. Medical personnel will be given the minimum amount of protective equipment necessary to ensure their safety while providing medical attention. If circumstances permit, proper decontamination procedures will be followed upon leaving the CRZ/Exclusion Zone.

12.7 Reports

Standard OSHA formats will be used for reporting any emergencies that occur on the site.

12.8 Accident Investigations and Reporting

12.8.1 Accident Investigations

All accidents requiring first aid which occur incidental to activities onsite will be investigated. The investigation format will include the following:

interviews with witnesses,
photos, if applicable, and
necessary actions to alleviate the problem.

12.8.2 Accident Reports

In the event that an accident or some other incident such as a fire or an overexposure to toxic chemicals occurs during the course of the project, the Project HSO will be telephoned within one hour and receive a written notification within 48 hours. The report shall include the following items:

Name, telephone number, and location of the contractor (if not LiRo personnel).
Name and title of person(s) reporting.
Date and time of accident/incident.
Location of accident/incident, (i.e., building number, facility name)
Brief summary of accident/incident giving pertinent details, including type of operation ongoing at the time of the accident.
Cause of accident/incident.
Casualties (fatalities, disabling injuries)
Details of any existing chemical hazard or contamination.
Estimated property damage, if applicable.
Nature of damage, effect on contract schedule.
Action taken to insure safety and security.
Other damage or injuries sustained (public or private).

13.0 SAFETY CONCERNS AND MEASURES DURING DRILLING OPERATIONS

Drilling operations pose a potential threat to the safety of site personnel. The following sections describe specific safety measures to be implemented during various phases of intrusive activities.

13.1 Soil Borings

An Active Exclusion Sub-zone is established by the opening of a borehole. Monitoring with real-time instrumentation will be performed at the borehole. Action levels will be considered to have been reached when a continuous, steady reading has been observed.

If at any time during drilling operations, buried utilities, USTs, metal, or concrete are penetrated, intrusive work activities will cease immediately. After assessing the situation, the project geologist/Site HSO will decide whether to continue or discontinue drilling. This decision will be based upon the field conditions.

13.2 Residual Soils

All residual soils generated during intrusive activities during the project will be handled as stated in the site Work Plans.

13.3 Decontamination Water

Based on historical sampling results, water generated from the decontamination of personnel and equipment in the Contamination Reduction Zone will be allowed to percolate into the ground surface. If soil PID screening suggests that highly contaminated soils are present, the decontamination water will be drummed and staged at the site for later transport and disposal at a commercial disposal facility.

13.4 Waste Management and Spill Control Plan

LiRo's Waste Management and Spill Control Plan for investigation activities is provided in Appendix E. This plan addresses the project procedures for waste handling, storage and disposal as well as emergency spill response.

13.5 Community Protection

Water spraying or misting will be used to control fugitive dust levels associated with soil borings. Spraying water shall be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor shall have sufficient suitable equipment on the job to accomplish this. The application rate will be controlled so as to prevent surface runoff into nearby storm sewer manholes and catch basins.

Site Ambient Air Monitoring

Ambient air monitoring will be conducted on a real time basis using a PID organic vapor meter. Baseline conditions will be measured at proposed soil boring locations prior to the commencement of operations. Readings will be taken at a frequency of one reading every hour taken within the breathing zone of the Exclusion Zone and at point sources of emission. Ambient air monitoring will be used to determine the appropriate level of worker protection.

Instrument readings will be recorded in a field notebook. Battery/charge level for each instrument will be checked at the beginning and end of each working day.

Community Air Monitoring Plan

While there are currently no proposed soil borings in close proximity to private residences, in the event that during the investigation soil borings become necessary in close proximity to private residences, ambient air quality monitoring will be performed. This is in addition to the normal monitoring of the work area for worker health and safety. Real time monitoring for volatile organics will be measured utilizing a PID.

If above background air monitoring results are encountered in the worker breathing zone for VOCs, community air monitoring will be conducted in compliance with the Community Air Monitoring Plan (CAMP) outlined below.

13.5.1 Vapor Monitoring

Organic Vapor Initial Monitoring

Volatile organic compounds will be monitored hourly upwind and downwind at the perimeter of the work area during all ground intrusive activities. If total organic vapor levels at the perimeter downwind location exceed the perimeter upwind location by 5 ppm, the Vapor Emission Response Plan must be implemented.

Vapor Emission Response Plan

If the downwind work area perimeter organic vapor concentration exceeds the upwind work area perimeter concentration by 5 ppm but less than 25 ppm, the following action will be taken:

- Every 30 minutes, monitor the perimeter work area location.

- Every 30 minutes, monitor the organic vapor concentration 200 feet downwind of the perimeter work area or half the distance to the nearest receptor, whichever is less. If this reading exceeds the perimeter work area upwind organic vapor concentration by 5 ppm, all work must halt and monitoring increased to every 15 minutes. If, at any time, this reading exceeds the perimeter work area upwind concentration by 10 ppm, the Major Vapor

Emissions Response Plan will be initiated.

- If organic vapor levels 200 feet downwind of the perimeter work area or half the distance to the nearest downwind receptor, whichever is less, exceeds by 5 ppm the work area perimeter upwind concentration persistently, then air quality monitoring must be performed within 20 feet of the nearest downwind receptor (20 foot zone). If the readings in the 20 foot zone exceed the perimeter work area upwind concentration by 5 ppm for more than 30 minutes, then the Major Vapor Emission Response Plan will be implemented.

- Work activities can resume only after downwind 200 foot reading and the 20 foot zone reading are <5 ppm above the perimeter work area upwind concentration. In addition, the downwind perimeter work area concentration must be <25 ppm above the upwind work area perimeter concentration.

Major Vapor Emission Response Plan

If the downwind work area perimeter organic vapor concentration exceeds the upwind work area perimeter concentration by more than 25 ppm, then the Major Vapor Emission Response Plan will be activated. Upon activation, the following activities will be undertaken:

- Halt work
- NorDel II, LLC and NYSDEC will be notified and advised of the situation.
- Local police and fire department contacts will be notified and advised of the situation.
- Frequent air monitoring will be conducted at 30 minute intervals within the 20 foot zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer and work may resume.

13.5.2 Particulate Monitoring

Particulates will be monitored upwind and downwind at points 25 feet from the perimeter of the work area every 30 minutes during the exterior boring activities. If the difference between the measured upwind and downwind concentrations is greater than or equal to 100 ug/m3 all work activities must be stopped and dust suppression methods employed. Work may resume only after the measured upwind/downwind difference has been reduced to less than 100 ug/m3.

TABLES

TABLE 6-1
HAZARD CHARACTERISTICS OF CONTAMINANTS SUSPECTED AT THE WESTERN NEW YORK WORKFORCE TRAINING CENTER SITE

Substance	Flammability/Reactivity	Toxicity/Carcinogenicity	Standards*
Volatile Organic Compounds (VOCs)	Normally Class 1B flammable liquids, strong oxidizers	Generally of low toxicity; C-1 through 3 compounds are simple inert asphyxiates; C-4 through 9 compounds may cause respiratory tract irritation and anesthetic effects, they may also produce dermatitis.	Includes a wide variety of compounds, field measuring instruments are normally calibrated to benzene, since it has the lowest OSHA PEL of 1 ppm. OSHA and AFOSH have set a PEL of 400 ppm per 8-hour workday, 40-hour workweek. NIOSH recommends that workplace air levels not exceed 350 mg/m^3 for a 40-hour workweek.
PCBs	Nonflammable. Reacts with strong oxidizers	Toxic by inhalation, skin absorption, ingestion, skin/eye contact. Symptoms include eye irritation and chloracne. Exposure may result in liver damage and reproductive effects. Potential occupational carcinogen.	0.001 mg/m^3 (NIOSH REL-TWA) 0.5 mg/m^3 [skin] (OSHA PEL-TWA)
Polynuclear Aromatic Hydrocarbons (PAHs)	Combustible when exposed to heat or flame	Many PAHs are toxic by inhalation and easily absorbed by the skin. Prolonged exposure may result in tissue injury, dermatitis, and chemical burns. Inhalation of high concentrations can result in bronchial irritation, cough, hoarseness, and pulmonary edema. Acute doses are toxic to may tissues, but thymus and spleen are particularly sensitive.	No standards available for this group of compounds
Asbestos	Not flammable	Cancer hazard in humans. Inhalation of fibers may cause asbestosis, interstitial fibrosis of the lung tissue, respiratory or lung infections, pleural effusion, pleural or peritoneal mesotheliomas, bronchogenic carcinoma, lung cancers, and/or cancers of the gastrointestinal tract and larynx.	0.01 f/cc (OSHA PEL – 8 hr. TWA) 1.0 f/cc (OSHA – 30 minute excursion limit)
Arsenic	Non-combustible in solid form. Slight combustible hazard in powder form	Toxic by ingestion, skin absorption, and inhalation of dust or fumes. Neurological, pulmonary and renal toxin.	0.002 mg/m^3 (NIOSH REL) (15-min.) 0.010 mg/m^3 (OSHA PEL)
Beryllium	Non-combustible in solid form. Slight combustible hazard in powder form	Toxic by ingestion, skin absorption, and inhalation of dust or fumes. Neurological, pulmonary and renal toxin.	<0.0005 mg/m^3 (NIOSH REL) 0.002 mg/m^3 (OSHA PEL-TWA)

Substance	Flammability/Reactivity	Toxicity/Carcinogenicity	Standards*
Cadmium	Not flammable. Emits toxic fumes when heated	Toxic by ingestion and inhalation of dust or fumes. Induces pulmonary edema and dyspnea. Pulmonary and renal toxin. Confirmed human carcinogen.	2.5 ug/m^3 (OSHA ACTION LIMIT 8-hr. TWA) 5.0 ug/m^3 (OSHA PEL-TWA)
Lead	Not flammable. Emits toxic fumes when heated	Toxic by ingestion and inhalation of dust or fumes. Lead poisoning in children is common. Neurological toxin and reproductive hazard	30 ug/m^3 (OSHA ACTION LIMIT 8-hr. TWA) 50 ug/m^3 (OSHA PEL-TWA)
Mercury	Not flammable. Emits toxic fumes when heated	Toxic by ingestion, skin absorption and inhalation of vapors and fumes. Neurological, pulmonary and renal toxin	NIOSH REL 0.1 mg/m^3 (Other) NIOSH REL TWA 0.05 mg/m^3 (Vapor)
Nickel	Combustible in solid form	Toxic by ingestion, skin absorption, and inhalation of dust or fumes. Neurological, pulmonary and renal toxin.	0.015 mg/m^3 (NIOSH REL-TWA) 1.0 mg/m^3 (OSHA PEL-TWA)
Zinc	Combustible in solid form	Toxic by ingestion, skin absorption, and inhalation of dust or fumes. Neurological, pulmonary and renal toxin.	10.0 mg/m^3 (OSHA PEL-TWA)
Pesticides	Combustible solid. Reacts with strong oxidizers, alkalis	Exposure through inhalation, skin absorption, ingestion, skin/eye contact. Symptoms include skin/eye irritation; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise, headache, exhaustion; convulsions; vomiting. Potential occupational carcinogen	0.5 mg/m3 (NIOSH REL-TWA) 1.0 mg/m3 [skin] (OSHA PEL-TWA)

NOTES

* - Standards are 8-Hour Time-Weighted Averages (TWAs) unless otherwise noted.

** - Adopted values are limits which have been proposed for the first time, or for which a change in the "Adopted" listing has been proposed under the notice of intended changes by the American Conference of Governmental Industrial Hygienists.

1) - TLV-C-Ceiling - The exposure that should not be exceeded, even instantaneously.

2) - TLV-STEL - Short term exposure limit - 15 minute TWA exposure which should not be exceeded at any time during a workday.

REFERENCES

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TABLE 8-1

COMPONENTS OF PERSONAL PROTECTION LEVELS

Level D Protection	Level D+ Protection	Level C Protection
Safety glasses with side shields (or goggles)	Safety glasses with side shields (or goggles)	Hard Hat
Hard Hat	Hard Hat	Chemical resistant or disposable coveralls based on Permeation Tables
Face Shield (optional)	Face Shield (Optional)	Inner gloves of tight-fitting latex or nitrile
Ordinary coveralls	Chemical resistant or disposable coveralls	Outer gloves of neoprene or nitrile
Ordinary work gloves	Outer gloves of neoprene or nitrile	Steel-toe, steel-shank work safety boots (chemical resistant)
Steel-toe, steel-shank work shoes or boots	Steel-toe, steel-shank work shoes or boots with or without disposable outer booties	Outer boots of neoprene or butyl rubber or disposable outer booties
	Half-face air-purifying respirator (immediately available)*	Full-face air-purifying respirator (to be worn)**
		Taping of gloves and boots to disposable coveralls

* Respirator to be fitted with NIOSH/MSHA - approved high-efficiency filter (HEPA) combination respirator cartridges approved for organic vapors, particulates, gases, and fumes.

** Half-face respirator, face shield, and safety glasses with side shields (or goggles) may be substituted with approval of the Site HSO.

TABLE 8-2

PLANNED LEVELS OF PERSONAL PROTECTION FOR EACH ACTIVITY

Field Activity			Level of Protection
A.	Non-Intrusive Activities		
	1.	Boring/Monitoring Well Layout	D
	2.	Support Zone Activities	D
B.	Intrusive Activities		
	1.	Drilling and Well Installation	D
	2.	Surface Soil Sampling	D
	3.	Soil/Sub-Slab Vapor Investigation	D
	4.	Equipment Decontamination	D

* These are the levels of protection at which work will commence during the various activities on the site. Due to onsite conditions, and as directed by the Site Health and Safety Officer, it may become necessary to upgrade or downgrade the level of personal protection.

TABLE 9-1
ACTION LEVELS DURING INTRUSIVE ACTIVITIES

Instrument readings in breathing zone unless otherwise noted.

Each action level is independent of all other action levels in determining responses.

Organic Vapors (PID)	**Responses**
0-1 ppm Above Background	" Continue work activities " Level D+ protection " Continue monitoring every 10 minutes/every sample retrieved
1-5 ppm Above Background, Sustained Reading	" Continue work activities " Level C protection " Continuous monitoring
5-25 ppm Above Background Sustained Reading	" Discontinue work activities " Withdraw from area; shut off all engine ignition sources " Allow hole to vent " Continuous monitoring for organic vapors 200 ft. downwind
Dust	**Responses**
Visible Emissions Above Background at Site Boundary	" Discontinue work activities and employ dust suppression (water) before resuming work

NOTES: Air monitoring for action levels will occur in the breathing zone 30" above the borehole. Readings will be recorded in the excavation/borehole, but will not be used for action levels.

If action levels for any one of the monitoring parameters is exceeded, the appropriate responses listed in the right hand column should be taken.

If instrument readings do not return to acceptable levels after the hole has been vented for a period of greater than one-half hour, the hole will be abandoned.

FIGURES

APPENDIX A
FIELD ACTIVITY FORMS

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, NY 14209

INSTRUMENT READING LOG

Project: _____ Job No.: _____

Date: _____ Operator: _____

Instrument: _____ Calibration: _____

Amt. Component. Date

Sampling Technique: _____

Wind Speed/

Temperature Range: _____ Humidity: _____ Direction: _____

Sample Interval: _____

Background Reading: _____

Action Level/Response: _____

Time	Location/Task	Reading (units)	Detection Limit (Scale)

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, NY 14209

GENERAL SITE SAFETY RULES FOR CONTRACTORS
RECEIPT

Receipt of "Contractor Site Safety Rules Checklist" is hearby acknowledged. The information contained within has been read and will be adhered to when performing obligations on behalf of LiRo.

Executed this _____ day of _____, 19_____

By: _____

(Signature)

_____

(Name Printed)

_____

(Title)

For: _____

(Company Name)

_____

(Company Address)

_____

_____

(Phone Number)

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, NY 14209

ONSITE SAFETY BRIEFING

Date: _____ Project: _____

Meeting Conducted By: _____

Name

_____

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LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, NY 14209

HAZARDOUS WASTE ACTIVITIES
HEALTH & SAFETY CHECKLIST

Project: _____

Project Manager: _____

Onsite Health & Safety Officer: _____

The Project Manager or onsite Health and Safety Officer will signify the completion of the following items by initializing and dating each item.

	Initial	**Date**
Site health and safety plan prepared and approved by health and safety manager	_____	_____
All employees who will be onsite:		
• Have received initial (24 or 40 hr.) training	_____	_____
• Have received annual 8 hr refresher training	_____	_____
• Have reviewed the site health and safety plan and received pre-job briefing	_____	_____
• Have received respiratory protective equipment training including SCBA if required	_____	_____
• Have received negative pressure respirator fit test	_____	_____
• Have had a medical exam within the past 12 months	_____	_____

This form is to be submitted to the health and safety director prior to onsite work which may involve exposure to hazardous materials.

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, NY 14209

CONTRACTOR SITE SAFETY RULES CHECKLIST

The following checklist shall be reviewed and signed by the prime contractor, and his subs, and LiRo's project manager or job site supervisor of designees, prior to the scheduled start of a job. While the job is in progress, where applicable, hazardous operations permits shall be obtained on a daily basis, or more frequently, as appropriate to assure safety.

General

G All vehicles shall observe a maximum speed limit of 10 MPH, unless otherwise posted. There will be no passing of moving vehicles at job sites when narrow roads and short-sight distances exist.

G Hard hat and approved eye protection are required at all times except in designated areas.

G Smoking or eating is permitted only in designated areas.

G Contractor is expected to maintain good housekeeping during the duration of work. Daily trash pick up is required. At the end of the job the Contractor shall leave the job site in at least as good an appearance and condition as it was found.

G Contractor is to provide first-aid kit. Contractor hearby prescribes emergency hospital as indicated below:

Hospital: _____ Phone: _____

Address: _____

G Review with site supervisor the emergency evacuation route and telephone location. In case of emergency, notify site supervision immediately and call the appropriate service.

Fire Department: _____

Ambulance: _____

Sheriff: _____

G LiRo work rules also prohibit:

- Possession or consumption of intoxicants or illegal drugs or narcotics
- Violation of Federal and State safety regulation
- Gambling
- Possession of firearms
- Fighting, horseplay, or practical joking
- Sabotage or pilfering
- Running, except in an emergency

G All accident (personal injury or property damage) shall be reported to the LiRo supervisor as soon as emergency conditions no longer exist. The person involved shall make a written accident report prior to leaving the site, unless prevented by emergency conditions, e.g., injury.

CONTRACTOR SITE SAFETY RULES CHECKLIST (Continued)

- G There shall be no personnel on the work site except for authorized contractor/subcontractor employees without LiRo management approval.

- G LiRo representative has discussed with the contractor and his subcontractors, the nature of the potential hazards that may be encountered.

Hazardous Atmospheres and Hazardous Environments

- G Contractor shall provide his own calibrated combustible gas/oxygen analyzer or other instruments for checking areas before confined space, hot work, or other work in hazardous atmospheres or environments. Contractor is responsible for all testing and monitoring required by applicable regulations. No testing by LiRo shall be in lieu of above requirements.

- G Contractor shall provide a standby during confined space work and a fire watch during hot work.

- G Hot work, confined space entry, line opening procedures, scaffolding, use of heavy equipment, excavations and trenching, and other planned hazardous atmospheres and hazardous environment activities shall be reviewed with site supervisor before commencing work.

- G Contractor personnel shall know the location of the nearest fire extinguisher, fire water line, safety shower, and eye bath.

- G Any change of conditions around hot work, confined space, or other hazardous atmospheres or hazardous environment areas which could affect pervious test readings or safety conditions shall invalidate all permits and approvals. Retesting or reevaluation of the area, by a designated person, is required before work can be resumed.

Contractors are expected to brief their employees and enforce these rules. LiRo management may stop or suspend work, at no cost to LiRo, any time the Contractor fails to comply with LiRo Safety Requirements.

_____	_____	_____	_____
Contractor Signature	Date	LiRo Representative Signature	Date

_____	_____
Name Printed	Name Printed

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, NY 14209

REPORT OF ACCIDENT INJURY

Project: _____ Date of Occurrence: _____

Location: (be specific) _____

_____

Type of Occurrence: (check all that apply)

G Disabling Injury
G Property Damage
G Chemical Exposure
G Explosion
G Other (explain) _____
_____
G Other Injury
G Equipment Failure
G Fire
G Vehicle Accident

Witnesses to Accident/Injury: (and office)

_____ _____

_____ _____

_____ _____

Injuries:

Name of Injured: _____ Office: _____

What was being done at the time of the accident/injury?

_____

_____

_____

_____

Nature of the Accident/Injury: _____

_____

_____

What caused the Accident/Injury? _____

_____

_____

_____

_____

What corrective action will be taken to prevent recurrence? _____

_____

_____

_____

_____

Signatures:

Health and Safety Officer _____ Date: _____

Project Manager _____ Date: _____

Reviewer _____ Date: _____

Comments by Reviewer: _____

_____

_____

_____

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_____

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_____

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, NY 14209

ONSITE SAFETY BRIEFING

Date: _____ Project: _____

Meeting Conducted By: _____

Name

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LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, NY 14209

TAILGATE SAFETY MEETING

Date: _____ Customer: _____
Specific Location: _____

Safety Topics Presented:

Protective Clothing/Equipment: _____
_____

Chemical Hazards: _____
_____

Physical Hazards: _____
_____

Emergency Procedures: _____
_____

Hospital/Clinic: _____ Phone: _____
Paramedic Phone: _____

Hospital Address: _____

Special Equipment: _____
_____

Other: _____
_____
_____

Attendees:

Name Printed:	Signature:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Meeting conducted By:

_____ _____

Name Printed Signature

APPENDIX B

STANDARD OPERATING SAFETY PROCEDURES

TABLE B-1

PERSONAL SAFETY RULES

- Personnel onsite must use the buddy system when wearing respiratory protective equipment.
- Visual contact must be maintained between crew teams onsite.
- Any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in any area designated as contaminated. These practices include as a minimum eating, drinking, chewing gum or tobacco, and smoking.
- Hands and face must be thoroughly washed upon leaving the work area, and before engaging in any other activities, especially eating or drinking.
- Due to interference of facial hair with the mask-to-face seal on air-purifying respirators, personnel working onsite will not be permitted to wear facial hair that interferes with the seal.
- Contact with contaminated surfaces or surfaces suspected of contamination should be avoided. Site personnel should avoid walking through puddles, mud, or other discolored areas, and should not kneel or sit on the ground.
- Field personnel, shall be familiar with the physical characteristics of the site, including:
  - wind direction in relation to the working area
  - accessibility to associates, equipment, and vehicles
  - communications
  - work zones
  - site access
- Medicine and alcohol can exacerbate the effect from exposure to toxic chemicals. Prescribed drugs should not be taken by field personnel where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Alcoholic beverage and controlled substance intake is strictly forbidden during onsite operations.

TABLE B-2

OPERATIONAL SAFETY RULES

- No visitors shall be allowed onsite without the express permission of NorDel II, LLC.
- Onsite personnel must use the buddy system when wearing respiratory protective equipment. A third person, suitable equipped, is required as a safety backup during initial site entries.
- During day-to-day operations, onsite workers will act as a safety backup to each other. Offsite personnel will provide emergency assistance.
- Wind indicators will be set up so as to be visible from the Exclusion Zone.
- Backhoes/drilling rigs will be kept clean and free of accumulated greases, oils, and other combustible materials.
- No containers or fuels or other flammables will be kept within 100 feet of any excavator or drilling rig.
- Daily briefings will be held to review site hazards, changes in level of personal protection required, special safety precautions for assigned work activities, and emergency response.
- All personnel going onsite must be thoroughly briefed on anticipated hazards, and trained on equipment to be worn, safety procedures emergency procedures, and communications.

APPENDIX C

LiRo Engineers, INC.

RESPIRATORY PROTECTION PROGRAM

RESPIRATORY PROTECTION PROGRAM

TABLE OF CONTENTS

ATTACHMENTS

AS REFERENCED IN LIRO ENGINEERS
RESPIRATORY PROTECTION PROGRAM

EXHIBIT 1 Classification and Description of Respirator

EXHIBIT 2 Capabilities and Limitations for Respirators

EXHIBIT 3 Procedures for Conducting a Qualitative Fit-Test

EXHIBIT 4 Respirator Fit Test and Training Record

EXHIBIT 5 Respirator Inspection Chart

LiRo Engineers, Inc.

RESPIRATORY PROTECTION PROGRAM

1.0 PURPOSE

The standard established uniform guidelines for complying with the requirements of the Occupational Safety and Health Administration (OSHA) for Respiratory Protection, Title 29, Part 1910, Section 134 of the Code of Federal Regulations, and provides organization-wide procedures for the proper selection, use and care of respiratory protective equipment.

2.0 SCOPE

This standard applies to all LiRo projects with potentially airborne exposure.

3.0 POLICY

Every consideration will be given to the use of effective administrative and engineering controls to eliminate or reduce exposure to respiratory hazards to the point where respirators are not required in controlling toxic substances, appropriate respiratory protective equipment will be provided by the company at no charge to the employee.

Respiratory protective devices will be appropriate for the hazardous material(s) involved, and the extent and nature of the work requirements and conditions.

Employees required to use respirators will be properly fitted, appropriately tested, medically screened, and thoroughly trained in their use.

4.0 CODES AND REGULATIONS

General applicability of Codes and Regulations. Except to the extent that more stringent requirements are written directly into this standard, all applicable codes and regulations have the same force and effect as if copied directly into this standard.

FEDERAL REGULATIONS: Those standards governing the development of this program include, but are not limited to, the following:

Asbestos Regulations - Industrial
Title 29, Part 1910 Section 1001 of the Code of Federal Regulations

Asbestos Regulations - Construction
Title 29, Part 1926, Section 58 of the Code of Federal Regulations

Respiratory Protection
Title 29, Part 1910, Section 134 of the Code of Federal regulations

Access to Employee Exposure and Medical Records
Title 29, Part 1910, Section 20 of the Codes of Federal Regulations
NIOSH/MSHA Approvals for Respirators
Title 42 CFR 84, of the Code of Federal Regulations

American National Standards Institute (ANSI)
American National Standard: Practices for respiratory Protection, Z88, 2-1980.

5.0 DESIGNATION OF ADMINISTRATOR

The designated program administrator if the Corp. Safety Officer who has the responsibility for implementation of, and the adherence to, the provisions of this respiratory protection program. The Corp. Safety Officer will designate a person who is responsible for the enforcement of the program at each job site. This will be the site supervisor/foreman or on-site safety representative.

In order to comply with OSHA's "competent person" requirements, the person designated must have two qualifications. He or she must have experience in identifying and controlling exposures, and authority to promptly prevent and correct hazardous conditions.

6.0 PURCHASE OF APPROVED EQUIPMENT

In order to comply with the provisions of OSHA's Standard on Respiratory Protection, 29 CFR 1910.134, all respiratory protective equipment will have been tested by the National Institute of Occupational Safety and Health and will carry a joint NIOSH/MSHA approval number for that specific respirator assembly.

7.0 RESPIRATORY SELECTION

In selecting the correct respirator for a given circumstance the following factors be taken into consideration:

Nature of the Hazard - In order to make subsequent decisions, the nature of the hazard must be identified to ensure that an over exposure does not occur. These include oxygen deficiency, physical properties of the hazard, actual concentrations of the toxic substances, the Permissible Exposure Limits (PEL), and the warning characteristics.

Nature of the Hazardous Operations - For proper respirator selection, it is necessary to know the details of the operations which require employees to use devices. These include operations or process characteristics, and work characteristics which may necessitate alternate respirator selection.

Location of the Hazardous Area - This is important in the selection process so that a backup system may be planned, if necessary. Respirable or emergency operations may be planned.

Time Respiratory Protection is Required - The length of time a respirator will have to be worn by an employee is a factor which must be evaluated. This is most pronounced when using SCBA equipment where, by definition, the air supply is limited. However, time is also a factor during routine use of air purifying respirators when the employee's breathing and comfort become affected by clogged filter cartridges which may need changing.

Employee's Health - Effective usage of a respirator is dependent on an individual's ability to wear a respirator as determined by a physician. Most respiratory devices increase physical stress on the body, especially the heart and lung. Care should be taken to ensure that medical determination has been made that an individual is capable of wearing a respirator for the duration of the work assignment (See Section 11.0 of the Standard).

Work Activity - The type of work activities to be performed while wearing a respirator is vitally important in the respirator selection. The proper respirator will be one which is least disruptive to the task being conducted, yet providing the desired protection.

Respirator Characteristics, Capabilities, and Limitations - The tables in Exhibits 1 and 2 have been reproduced from ANSI Z99.2-1980. They provide a description of various respirator characteristics, capabilities, and limitations.

Protection Factors - The protection afforded by respirators is dependent upon the seal of the face piece to the face. The degree of protection may be ascertained and a relative safety factor as designed. Protection factors are only applicable if all elements of an effective respirator program are in place and being enforced.

7.1 SELECTION

Where respirators are used, the Corporate Safety Officer will select, the appropriate respirator, and will ensure that the employee uses the respirator provided.

7.2 COMFORT

Once the type of respirator has been selected, that is applicable and suitable for the purpose intended, the selection process should give consideration to the fit and comfort of the respirator.

The employee should be given the opportunity to select a respirator which provides the most comfortable fit. Since each respirator represents a different size and shape, a respirator which fits better during selection will provide better protection after fit-testing. For this purpose, the employee should be shown how to access a comfortable device and should eliminate those which are obviously ill-fitting.

An assessment of comfort should include the following points:

Chin properly placed
Positioning of mask on nose
Strap tension
Room to talk
Cheeks filled out
Fit across nose bridge
Room for safety glasses
Distance from nose to bridge
Tendency to slip
Hindrance to movement

8.0 ISSUANCE OF EQUIPMENT

When practical, respirators should be assigned to individual employees for their exclusive use and labeled for identification in such a way as not to affect the performance of the respirator.

8.1 FITTING

After the employee has been shown how to assess a respirator, he/she should be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine a proper fit.

Note: The instruction should take the form of a review and should not be considered the employee's formal training.

The employee should hold each face piece up to the face and eliminate those which obviously do not give a comfortable or proper fit. Normally, fitting should start with a half-face mask and if a good fit cannot be found, the employee should then try a full-face mask.

8.2 FAMILIARIZATION

Once the proper fitting respirator has been selected, the employee should don the device, adjusting the face piece and tension straps. He/she should wear the mask for as least five minutes before taking it off and putting it on several times, adjusting the straps each time to become familiar with the respirator and adept at setting the proper tension on the straps.

8.3 FIT-TESTING REQUIREMENTS

OSHA requires that respirators be fitted properly and that they be tested for their face piece to face seal. There are currently two methods acceptable for conducting these tests. Qualitative and Quantitative Fit Testing. The Qualitative method is a fast, easily conducted test that can be performed almost anywhere, while the Quantitative method requires the use of bulky test chambers and very expensive electronic equipment. The Quantitative method applies only to negative pressure non-powered air-purifying respirators.

Due to numerous field locations in which fit-testing must be accomplished the Qualitative fit test shall be utilized throughout the LiRo Group's organization.

Qualitative fit testing is based on the wearer's subjective response to the test agent of chemical of which the two most popular tests are: the odorous vapor test, and the taste test. (See Exhibit 3 procedures). The following represents a brief summary of how to conduct each of these tests.

8.3.1 ODOROUS VAPOR TEST

The odorous vapor test relies on the respirator wearer's ability to detect odorous materials, usually isoamyl acetate saturated material around the outside of the respirator. If the wearer is unable to smell the chemical, then a satisfactory fit is assumed to be achieved.

When an air purifying respirator is tested by this method, it should be equipped with an inorganic vapor cartridge which removes the test vapor from the air.

Note: This test is solely dependent upon the employees honest response there is no involuntary reaction. For that reason, it is the preferred test method.

8.3.2 TASTE TEST

The taste test relies upon the wearer's ability to detect a chemical substance, usually sodium saccharin, by tasting it inside the respirator. The test performed by placing an enclosure over the respirator wearer's head and shoulders, and spraying the test agent into the enclosure with a nebulizer. If the wearer is unable to taste the chemical, then a satisfactory

fit is assumed to be achieved.

Note: This test is totally dependent on the wearer's honest indication of taste. There is no involuntary response and therefore is not preferred as the method of testing. When conducting this type of test, the person being tested must not be allowed to eat, drink, chew gum, tobacco, or smoke.

8.4 FIELD TEST

There are two tests that are used in the field to check the seal of the respirator. These are known as the positive and negative pressure sealing tests. Each of these two tests must be performed every time a respirator is put on, and prior to entering a contaminated area.

Note: Although both the positive and negative pressure tests are considered essential to a good respiratory protection program and should always be used prior to entering an area of exposure, they are recognized solely as a field test and cannot be substituted for the qualitative fit test.

8.4.1 POSITIVE PRESSURE TEST

1. This test only applies to those respirators which have an exhalation valve which can be blocked. The exhalation valve may have to be removed for the test.

2. Close or "block off" the exhalation valve.

3. Exhale gently into face pieces.

4. If a slight pressure is built up, with no apparent outward leakage around face pieces to face, seal is assumed to be satisfactory.

8.4.2 NEGATIVE PRESSURE TEST

1. Close the inlet opening or hose of the respirator face pieces with the hand(s), tape or the other means.

2. Inhale gently so that the face pieces collapse slightly and hold the breath for ten seconds.

3. If the face pieces remains slightly collapsed and no inward leakage occurs, then the face pieces to seal is assumed satisfactory.

8.5 RECORD KEEPING OF TEST RESULTS

A summary of the test results for each employee on whom a qualitative fit test was conducted will be documented on the Respirator Test Summary (See Exhibit 4). This record will then become a part of the employee's medical record and will be retained for the same time period as the medical records.

9.0 TRAINING

Respirators will not be issued to individuals (including company officials, subcontractors, or visitors) who have not received appropriate training and medical clearance.

9.1 TRAINING PROGRAM

The extent and frequency of employee *training depends primarily on the nature and extent of the hazard*. As a minimum, all employees and supervisory personnel will be trained in basic respirator practices. It must be remembered that respirators are effective only when they are acceptable to the employee and worn properly by him/her. Because proper use depends especially upon the wearer's motivation, it is important that the need for the respirator be explained fully.

The basic respirator training program must include:

A discussion of the nature of airborne contaminants against which the employee must be protected and why engineering controls have not been effective in controlling exposure to the point where respirators are not required.

A discussion of why the respirator, which has been selected for this job, is the proper device for this particular purpose.

Instruction on the respirator's limitations, emphasizing such things as oxygen deficiency, toxic contaminants which are immediately dangerous to life or health, and the need for change filter cartridges when indicated to do so by testing, or when breathing resistance increases to an uncomfortable level.

Instructions on how to inspect the respirator and ensure that it is in proper working condition.

Instructions on how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to wear the respirator comfortably.

Instructions on the method of fit-testing used and the proper way to conduct positive and negative pressure test each

time the respirator is put on. During this instruction, the wearer must be made to understand that the respirator cannot be used when conditions prevent a satisfactory face piece to face seal. If this condition cannot be corrected, the employee cannot be allowed into the area requiring the use of a respirator.

Instructions in the proper care and maintenance of the respirator.

A discussion on the value of medical surveillance and air sample monitoring.

Field training to recognize and cope with any type of emergency while using the respirator.

9.2 RESPIRATOR TRAINING RECORD

Upon completion of the basic respirator training program, the employee will be required to read and sign the Respirator Training Record (See Exhibit 4) attesting to the fact that they have received the basic training program and fell confident in their ability to use the respirator properly.

The signed and dated Respiratory Training Record will then become part of the employee's medical records and will be retained for the same period of time as those records.

10.0 CARE AND MAINTENANCE

Personnel involved in respirator maintenance must be thoroughly trained. Substitution of parts from different brands or type of respirators invalidate approval of the device. Repairs and adjustments should never be made beyond the manufacturer's recommendations.

10.1 CLEANING THE RESPIRATOR

Respirators must be cleaned and disinfected after each day's use when they are assigned to one individual or after each use if they are assigned to more than one person following procedures are recommended for cleaning and disinfecting the respirator:

If required, remove and discard filters or cartridges.

Wash face piece and breathing tube in detergent and warm water (120□F) or cleaner/disinfectant solution. Use a soft brush to facilitate removal of dirt. Cleaner/disinfectant solutions are available from respirator manufacturers or it can be made using a solution of water and household chemicals such as two tablespoons of chlorine bleach to one gallon of water or one teaspoon or tincture of iodine solution is sufficient for

disinfecting.

Rinse completely in clean warm water.

Air dry in clean air.

Clean out other parts, as recommended by the manufacturer.

Inspect the valves, head straps, and other parts - replace with new parts of defective.

Place face piece in a plastic bag or container for storage in an assigned area.

Insert new filters or cartridges prior to use, making sure the seals are tight.

10.2 STORING THE RESPIRATOR

When they are not being used, respirators should be individually sealed in plastic bags and stored at convenient locations in order to protect them against dust, sunlight, extreme temperatures, excessive moisture, or damaging chemicals. They should be stored in such a way that the face piece and exhalation valve are not being distorted.

10.3 INSPECTING THE RESPIRATORS

All respirators should be inspected before and after use, and at least monthly by a competent person to assure that they are in satisfactory working condition. A general inspection check list should include:

Tightness of connections
Conditions of face piece straps, connecting tubes, and cartridge

Condition of exhalation and inhalation valves: If the side of the exhalation valve gaps even slightly, it must be replaced with a new valve.

Pliability and flexibility of rubber parts: Deteriorated rubber parts must be replaced, unused rubber parts should be worked, stretched and manipulated, with a massaging action.

Proper function of regulations and warning devices

Respiratory protection is no better than the condition of the respirator in use, even though it is worn conscientiously.

Frequently, random inspections must be conducted by a qualified individual to assure that the respirators are properly selected, fitted, used, cleaned, and maintained.

Note: For a detailed respirator check list, refer to the Respirator Inspection Chart in Exhibit 5.

10.4 CARE AND MAINTENANCE RECORDS

A written record should be maintained of the Care and Maintenance program within each individual company. Information contained on this record should include inspection reports, replacement parts used, dates of repair, cleaning and type of disinfectant used and the names of persons doing the work. The respirator should be identified by manufacturer, model, and approval number. Records should be retained for a period of five years.

11.0 MEDICAL REQUIREMENTS

Employees of the LiRo Group will not be assigned to tasks requiring the use of a respirator unless it has been determined that they are physically able to perform work, and use the respirator.

11.1 MEDICAL EXAMINATIONS

Employees who are working at or above Action Level of a toxic substance for thirty (30) days or more per year, or who are using a negative pressure respirator, will be required to undergo a medical evaluation of the following frequency:

Prior to assignment of a respirator for those employees who will be issued a negative pressure respirator.

At least annually thereafter.

Each procedure of the medical examination and evaluation will be performed by or under the supervision of a licensed physician and will include, as a minimum, a chest x-ray both posterior and anterior, a medical and work history and special emphasis directed to the pulmonary, cardiovascular, and gastrointestinal systems to determine the presence of any possible respiratory diseases. A pulmonary function test which will include both the maximum amount of air that can be expired from the lungs after full inhalation (FVC) and maximum amount of air forcibly expired in one second after exhalation (FEV10).

The only exception to this requirement, for an initial medical examination, is if the employee or company can provide adequate records/documentation to show that he/she has been examined in accordance with the provision of this program within the past one (1) year period.

11.2 MEDICAL FORMS

Medical surveillance will be conducted as described in the HASP. In addition to standardized questionnaires, the physician must also be furnished with a copy of the latest OSHA standards governing the type of exposure the employee will be involved in. A description of the employee's duties as they relate to the exposure, the anticipated exposure level, a description of the respiratory protection equipment to be used, and any available information from the previous medical examinations of the employee must also be furnished to the physician.

At the conclusion of the examination, the physician will submit a written opinion which will contain the results of the examination, conditions discovered by the physician that will prohibit the employee from using a respirator, and any recommendations from the physician regarding the employee's limitations. It will also contain a statement from the physician that he/she has informed the employee of the results of the examination.

A copy of the physician's opinion must be furnished to the employee by the company within thirty (30) days of its receipt by the company.

11.3 MAINTENANCE RECORDS

All records pertaining to the employee's medical examination must be retained for a period of thirty (30) years.

12.0 WORK AREA SURVEILLANCE

Although not specifically discussed in the Respiratory Protection Standard 29 CFR 1910.134, the standards require "appropriate surveillance". This should include identification of the containment, nature of the hazards, concentration at the breathing zone and, if appropriate, biological monitoring. The industrial hygienist who is conducting the air sampling should carefully document any apparent efficiencies in surveillance necessary to the respirator program.

13.0 PROGRAM EVALUATION

The program administration should periodically assess the effectiveness of the respiratory protection program during all phases of operation in which respiration are being used. Frequent walk-through inspections during these activities should be conducted to monitor and document supervisor and worker compliance with the requirements of the program. In addition to specific evaluations of the respirator cleaning, inspection, maintenance, desired results of these operations are consistently achieved.

14.0 VIOLATION AND DISCIPLINARY ACTION

Due to the LiRo Group's heavy involvement in various industrial facilities, respirator protection is a crucial part of the company's overall safety program. As such, mandatory compliance with all aspects of this program, by those employees required to use a respirator, is a condition of continuing employment.

14.1 DISCIPLINARY ACTION

When it has come to the attention of a supervisor that an employee has deliberately removed his/her respirator or broken the face piece seal while in the contaminated area, the employee will be immediately suspended from work and instructed to leave the job site pending a final disposition.

Random spot checks will be conducted to determine the effectiveness of the employee's fit test. Should the check, which will be a positive or negative pressure test conducted under the direction of a supervisor, indicated that the employee's respirator does not have satisfactory seal, the employee will be advised accordingly and instructed to leave the contaminated area. A written citation will be issued to the employee the first time he/she fails a random check. Two such citations on the same job will be sufficient cause for dismissal.

15.0 REPORTING RESPIRATOR PROBLEMS

Occasionally, the company may find a defect in the design or performance of a respirator. The best course to follow is to report these findings to the administrator of the company's respiratory protection program, which in turn, should report to LiRo's Safety Officer.

The respirator carries with it the approval of the National Institute of Occupational Safety and Health (NIOSH), the Corporate Safety Officer will report the findings to the respirator's manufacturer and to NIOSH.

This will be done by notifying the manufacturer of the defect in a report format and forwarding a copy of the report to NIOSH. The report will include the following:

The name, address, and telephone number of LiRo Engineers, Inc.

The name of the respirator's manufacturer

Model number of the respirator

The name and part number (if possible) of the defective part

A brief description of the respirator's use when the defect was discovered

A description of the defect

A description of the defects adverse effect on the respirator's performance

This report should be addressed to the NIOSH Division of Safety Research, testing and Certification Branch, 944 Chestnut Ridge Road, Morgan Town, West Virginia 26595.

EXHIBIT 1

CLASSIFICATION AND DESCRIPTION OF RESPIRATOR BY MODE OF OPERATION

1.0 ATMOSPHERE-SUPPLYING RESPIRATORS

A respirable atmosphere independent of the ambient air is supplied to the wearer.

Self Contained Breathing Apparatus (SCBA). A supply of oxygen, or oxygen-generating material is carried by the wearer. Normally equipped with full face piece, but may be equipped with a quarter-mask face piece, half-mask, helmet, hood or mouth piece, and nose clamp.

1.1 CLOSED-CIRCUIT SCBA (Oxygen only, negative pressure or positive pressure)

1.1.A COMPRESSED OR LIQUID OXYGEN TYPE

Equipped with a face piece or mouth piece and nose clamp. High pressure oxygen from a gas cylinder passes through a high pressure reducing valve and, in some designs, through a low-pressure admission valve to a breathing bag or container. Liquid oxygen is concerted to low pressure gaseous oxygen and delivered to the breathing bag. The wearer inhales from the bag, through a corrugated tube connected to a mouth piece or face piece and a one way check valve. Exhaled air passed through check valve and tube into a container of carbon dioxide removing chemical or as the bag deflates sufficiently to actuate an admission valve. A pressure-relief system is provided; and a manual bypass system and saliva trap may be provided depending upon the design.

1.1.B OXYGEN-GENERATING TYPE

Equipped with a face piece or mouth piece and nose clamp. Water vapor in the exhaled breath reacts with chemicals in the canister to release oxygen to the breathing bag. The wearer inhales from the bag through a corrugated tube and one-way check valve at the face piece. Exhaled air passes through a second check valve breathing tube assembly into the canister. The oxygen-release rate is governed by the volume of exhaled air. Carbon dioxide in the exhaled breath is removed by the canister fill.

1.2 OPEN-CIRCUIT SCBA (Compressed air, compressed oxygen, liquid air, liquid oxygen).

A bypass system is provided in case of regulator failure, except on escape-type units.

1.2A DEMAND TYPE C

Equipped with a face piece or mouth piece and nose clamp. The demand valve permits oxygen or air flow only during inhalation. Exhaled breath passes to ambient atmosphere through a valve(s) in the face piece.

1.2.B PRESSURE-DEMAND TYPE D

Equipped with a face piece only. Positive pressure is maintained in the face piece. The apparatus may have provisions for the wearer to select the demand or pressure-demand mode of operation, in which case the demand mode should be used only when donning or removing the apparatus.

1.3 SUPPLIED-AIR RESPIRATOR

1.3.A HOSE MASK

Equipped with a face piece, breathing tube, rugged safety harness, and a large diameter heavy-duty non-kinking air supply hose. The breathing tube and air-supply hose are securely attached to the harness. The face piece is equipped with an exhalation valve. The harness has provisions for attaching a safety line.

1.3.B HOSE MASK WITH BLOWER

Air is supplied by a motor driven or hand operated blower. The wearer can continue to inhale through the hose if the blower fails. Up to 200 feet (91 meters) of hose length is permissible.

1.3.C HOSE MASK WITHOUT BLOWER

The wearer provides motivating force to pull air through the hose. The hose inlet is anchored and filled with a funnel or like object covered with a fine mesh screen to prevent entrance of coarse particulate matter. Up to 75 feet (23 meters) of hose length permissible.

1.4 AIR-LINE RESPIRATOR

Respirable air is supplied through a small diameter hose from a compressor or compressed-air cylinder(s). The hose is attached to the wearer by a belt or other suitable means and can be detached readily in an emergency. A flow-control valve or orifice is provided to govern the rate of air to the wearer. Exhaled air passes to the ambient atmosphere through a valve(s) or opening(s) in the enclosure (face piece, helmet, hood or suit). Up to 300 feet (91 meters) of hose length is permissible.

1.4.A CONTINUOUS-FLOW CLASS

Equipped with a face piece, hood, helmet, or suit. At least 115 liters (4 cubic feet) of air per minute to light-fitting face pieces and 170 liters (6 cubic feet) of air per minute to loose-fitting helmets, hoods, and suits is required. Air is supplied to a suit through a system of internal tubes to the head, trunk, and extremities through valves located in appropriate parts of then suit.

1.4.B DEMAND TYPE C

Equipped with a face piece only. The demand valve permits the flow of air only during inhalation

1.4.C PRESSURE-DEMAND TYPE D

Equipped with a face piece only. A positive pressure is maintained in the face piece.

1.4.D COMBINATION AIR-LINE RESPIRATORS WITH AUXILIARY SELF-CONTAINED AIR SUPPLY

Include an air-line respirator with an auxiliary self-contained air supply. To escape from a hazardous atmosphere in the event the primary air supply fails to operate, the wearer switches to the auxiliary self-contained air supply. Devices approved for both entry into and escape from dangerous atmospheres have a low-pressure warning alarm and contain at least 15-minute self-contained air supply.

1.4.E COMBINATION ATMOSPHERE-SUPPLY AND AIR-PURIFYING RESPIRATORS

Provide the wearer with the option of using either of two different modes of operation:

1. An atmosphere-supplying respirator with an auxiliary air purifying attachment which provides protection in the event the air supply fails; or

2. An air purifying respirator with an auxiliary self-contained air supply which is used when the atmosphere may exceed safe conditions for use of an air-purifying respirator.

2.0 AIR-PURIFYING RESPIRATORS

Ambient air, prior to being inhaled, is passed through a filter, cartridge or canister which removes particles, vapors, gases, or a combination of these contaminants. The breathing action of the wearer operates the non-powered type of respirator. The power type contains a blower - stationary or carried by the wearer - which passes ambient air through an air-purifying component and then supplies purified air to the respirator inlet covering. The non-powered type is equipped with

a face piece or mouth piece and nose clamp. The powered type is equipped with a face piece, helmet, hood, or suit.

2.1 VAPOR - AND GAS - REMOVING RESPIRATOR

Equipped with cartridge(s) or canister(s) to remove a single vapor or gas (for example, chlorine gas), a single class of vapors or gases (for example: dust and fume), from air. Filter may be a replaceable part of a permanent part of the respirator. Filter may be the single-use or the reusable type.

2.2 PARTICULATE-REMOVING RESPIRATORS

Equipped with filter(s) to remove a single type of particulate matter (for example: dust), or a combination of two or more types of particulate matter (for example: dust and fume), from air. Filter may be a replaceable part of a permanent part of the respirator. Filter may be the single-use or the reusable type.

2.3 COMBINATION PARTICULATE - AND VAPOR - AND GAS - REMOVING RESPIRATOR

Equipped with cartridge(s) or canister(s) to remove particulate matter, vapors, and gases from air. The filter may be a permanent part, or replacement part of a cartridge or canister.

A. Device procedures negative pressure on respiratory inlet covering during inhalation

B. Device procedures positive pressure on respiratory inlet covering during both inhalation and exhalation.

C. Equipped with a demand valve that is activated on initiation of inhalation and permits the flow of breathing atmosphere to the face piece. On exhalation, pressure in the face piece becomes positive and the demand valve is deactivated.

D. A positive pressure is maintained in the face piece by a spring loaded or balanced regulator and exhalation valve.

EXHIBIT 2

CAPABILITIES AND LIMITATIONS OF RESPIRATORS

1.0 ATMOSPHERE-SUPPLYING RESPIRATORS

Atmosphere-supplying respirators provide protection against deficiency and toxic atmospheres. The breathing atmosphere is independent of ambient atmospheric conditions.

1.1 GENERAL LIMITATION

Except for some air-line suits, no protection is provided against skin irritation by material such as ammonia and hydrogen chloride, or against sorption of materials such as hydrogen cyanide, tritium, or organic phosphate pesticides through the skin. Face pieces present special problems to individuals required to wear prescriptive lenses (See 9.1). Use of atmosphere-supplying respirators in atmospheres immediately dangerous to life or health is limited to specific devices under specified conditions.

1.2 SELF CONTAINED BREATHING APPARATUS (SCBA)

The wearer carries his/her own breathing atmosphere.

1.2.A LIMITATIONS

The period over which the device will provide protection is limited by the amount of air or oxygen in the apparatus, the ambient atmospheric pressure (service life of open-circuit devices is cut in half by a doubling of the atmospheric pressure), and the type of work being performed. Some SCBA devices have a short service life (less than 15 minutes) and are suitable only for escape (self-rescue) from an irrespirable atmosphere.

Chief limitations of SCBA devices are their weight or bulk, or both, limited service life, and the training required for their maintenance and sale use.

1.3 CLOSED-CIRCUIT SCBA

The closed-circuit operation conserves oxygen and permits longer service life at reduced weight. The negative pressure type produces a negative pressure in the respiratory -inlet covering during inhalation, and this may permit leakage of contaminants, whereas the positive pressure type always maintains a positive pressure in the respiratory-inlet covering, and is less apt to permit inward leakage of contaminants.

1.3.A OPEN-CIRCUIT SCBA

The demand type produces a negative pressure in the respiratory-inlet covering during inhalation, whereas the pressure-demand type maintains a positive pressure in the respiratory-inlet covering during inhalation, and is less apt to permit inward leakage of contaminants.

1.3.B SUPPLIED-AIR RESPIRATORS

The respirable air supply is not limited to the quantity the individual can carry, and the devices are lightweight and simple.

1.3.B.1 LIMITATIONS

Limited to use in atmospheres from which the wearer can escape unharmed without the aid of the respirator.

The wearer is restricted in movement by the hose and must return to a respirable atmosphere by reacting his/her route of entry. The hose is subject to being severed or pinched off.

1.4 HOSE MASK

The hose inlet or blower must be located and secured in a respirable atmosphere.

1.4.A HOSE MASK WITH BLOWER

If the blower fails, the unit still provides protection, although a negative pressure exists in the face piece during inhalation.

1.4.B HOSE MASK WITHOUT BLOWER

Maximum hose length may restrict application of device.

1.5 AIR-LINE RESPIRATOR (Continuous Flow, Demand, and Pressure-Demand Types)

The demand type produces a negative pressure in the face piece on inhalation, whereas continuous-flow and pressure-demand types maintain a positive pressure in the respiratory-inlet covering and are less apt to permit inward leakage of contaminants.

Air-line suits may protect against atmosphere that irritate the skin or that may be absorbed through unbroken skin.

1.5.A LIMITATIONS

Air-line respirators provide no protection if the air supply fails. Some contaminants, such as tritium, may penetrate the material of an air-line suit and limit its effectiveness.

Other contaminants, such as fluorine, may react chemically with the material on an air-line suit and damage it.

1.5.B COMBINATION AIR-LINE RESPIRATORS WITH AUXILIARY SC AIR SUPPLY

The advantages and disadvantaged, expresses above, of the mode of operation being used will govern. The mode with greater limitations (air-purifying mode) will mainly determine the overall capabilities and limitation of the respirator, since the wearer may for some reason fail to change the mode of operation even though conditions would require such a change.

2.0 AIR-PURIFYING RESPIRATORS

2.1 GENERAL LIMITATIONS

Air purifying respirators do not protect against oxygen-deficient atmospheres, nor against skin irritations by, or sorption through the skin, of airborne contaminants.

The maximum contaminant concentration against which an air-purifying respirator will protect is determined by the design efficiency and capacity of the cartridge, canister, or filter, and face piece-to-face seal on the user. For gases and vapors, the maximum concentration for which the air-purifying element is designated is specified by the manufacturer or is listed on labels of cartridges and canisters.

Non-powered air purifying will not provide the maximum design protection specified unless the face piece or mouth piece/nose clamp is carefully fitted to the wearer's face to prevent inward leakage (See 7.2). The time period over which protection is provided is dependent on canister, cartridge, or filter type; concentration of contaminant; humidity levels in the ambient atmosphere; and the wearer's respiratory rate.

The proper type of canister, cartridge, or filter must be selected for the particular atmosphere and conditions. Non-powered air-purifying respirators may cause discomfort, due to noticeable resistance to inhalation. This problem is minimized in powered respirators. Respirators face piece present special problems to individual required to wear prescription lenses (See 9.1). These devices do have the advantage of being small, light, and simple in operation.

Use of air-purifying respirators in atmosphere immediately dangerous to life or health is limited to specific devices under specific conditions.

2.2 VAPOR AND GAS-REMOVING RESPIRATORS

2.2.A LIMITATIONS

No protection is provided against particulate contaminants. A rise in canister or cartridge temperature indicates that a gas vapor is being removed from the inspired air.

An uncomfortably high temperature indicates a high concentration of gas or vapor and requires and immediate return to fresh air.

Use should be avoided in atmosphere where the contaminant(s) lacks sufficient warning properties (that is: odor, taste, or irritation at a concentration in air at or above the (permissible exposure limit). Vapor-and-gas-removing respirators are not approved for contaminants that lack adequate warning properties.

Not for use in atmospheres immediately dangerous to life or health unless the device is a powered-type respirator with escape provisions (See Table 5).

- Full Face Piece Respirator provides protection against eye irritation, in addition to respiratory protection.
- Quarter-mask and Half-mask Face Piece Respirator provides a fabric covering (face let) available from some manufacturers shall not be used.
- Mouth Piece Respirator shall be used only for escape applications. Mouth breathing detection of contaminant by odor. Nose clamps must be securely in place to prevent nasal breathing.
- Limitations include no protection is provided against particulate contaminants. A rise in canister or cartridge temperature indicates that a gas or vapor is being removed from the inspired air.

3.0 PARTICULATE-REMOVING RESPIRATORS

3.1 LIMITATIONS

Protection against non-volatile particles only. No protection against gases and vapors.

Not for use in atmosphere immediately dangerous to life or health unless the device is a powered-type respirator with escape provisions.

3.1.A FULL FACE PIECE RESPIRATOR

Provide protection against eye irritation, in addition to respiratory protection.

3.1.B QUARTER-MASK AND HALF-MASK FACE PIECE RESPIRATOR

A fabric covering (facelet) available from some manufacturers shall not be used unless approved for use with respirator.

3.1.C MOUTH PIECE RESPIRATOR

Shall be used only for escape application. Mouth breathing prevents detection of contaminant by odor. Nose clamp must be securely in place to prevent nasal breathing.

3.2 COMBINATION PARTICULATE-AND-VAPOR-AND-GAS REMOVING RESPIRATORS

The advantages and disadvantages of the component sections of the combinations respirator as described above apply.

EXHIBIT 3

PROCEDURES FOR CONDUCTING A QUALITATIVE FIT-TEST

1.0 SMOKE TEST

1.1 RESPIRATOR SELECTION

1.1.A The test subject should be allowed to select the most comfortable respirator from any array of various sizes and manufacturers that includes at least three sizes and units of at least two manufacturers.

1.1.B The selection process should be conducted in an area away from the fit-test area to prevent odor fatigue. Prior to the selection process, the test subject should be shown how to put on a respirator, how it should be positioned on the face, and how to set strap tension.

1.2 SELECT THE TEST AGENT

1.2.A One of the two test agents, isoamyl acetate, or saccharin solution should now be selected.

1.3 CONDUCTING THE FIT-TEST

1.3.A Have the test subject properly don the selected respirator and tighten the tension straps to get a good face piece-to-face seal.

1.3.B At this point, have the test subject "seat" the mask by rapidly moving the head from side-to-side and up and down while taking a few deep breaths.

1.3.C The test subject should now conduct the positive and/or negative pressure test. If the positive and/or negative pressure test is not satisfactory, the selected respirator should be discarded at this point, and an alternate respirator selected and tested.

1.3.D If the positive and/or negative pressure was satisfactory, the test subject is ready for the fit-test.

1.3.E Allow the test subject to wear the respirator for approximately 8 to 10 minutes before continuing with the fit-test. During this time, review the test procedures with the test subject.

1.3.F Break both ends of a ventilation smoke tube. Attach a short length of tubing to one end of the smoke tube

and low pressure air pump or squeeze the bulb and force out of the tube.

1.3.G Direct the stream of smoke from the tube towards the face seal area of the test subject, beginning at least 12 inches from the face piece and gradually moving to within 1 inch, moving around the whole perimeter of the mask.

1.3.H Instruct the test subject to conduct the following exercise while respirator seal is being challenged by the smoke. Each exercise should be performed fro at least one minute.

1. Breathing normally

2. Breathing deeply. Be certain the breaths are deep and regular.

3. Turn the head from side-to-side. Be certain the movements are complete and that the test subject is inhaling when his/her head is at either side.

4. Nod the head up and down. Be certain the motions are complete. Have the test subject inhale when his/her head is at either side.

5. Have the test subject jog in place for a few seconds.

1.3.I When the test subject has passed the smoke test without evidence of a response, the respirator should be removed and the test subject is given a sensitivity check of the smoke from the same tube to determine whether he/she reacts to the smoke. Failure to evoke a response will void the whole fit-test.

1.4 SEMI-ANNUAL TESTING

The qualitative fit-test should be repeated at least once more every six months, if the user is assigned a new respirator, or whenever one or more of the following occur:

1.4.A The employee has a weight change of 20 pounds or more;

1.4.B Facial scaring occurs in an area of the face seal;

1.4.C The employee has significant dental changes;

1.4.D The employee has reconstruction or cosmetic surgery of the face, and

1.4.E Any other condition that may interfere with the face piece seal.

1.5 RECORD KEEPING

The Respirator Test Summary, shown in Exhibit 4, must be completed after each fit-test.

EXHIBIT 4

RESPIRATOR FIT-TEST AND TRAINING RECORD

Employee's Name: _____ Social Security No.: _____-_____-

Project Name: _____ Job Number:

RESPIRATOR FIT-TEST SUMMARY (*Must be conducted for each negative pressure respirator used*)

Fit-Test Date: _____ Person Conducting Fit-Test:
Respirator Selected:

Manufacturer: _____ Model:
Respirator Size: _____ NIOSH Approval No.:
Was Rainbow Passage Used: ___ Yes ___ No Was Face piece-to-face Seal Obtained: ___ Yes __ No

Signature of person conducting Fit-Test:

RESPIRATOR TRAINING RECORD

Your signature on the respirator Training Record will attest to your having received and understood the following respirator training information which both OSHA and LiRo Engineers, Inc. require as part of their Respiratory Protection Program.

The required respirator training consists of the following:

An explanation of the problems involved in misusing or inter-changing parts of the respirator.
A discussion of why engineering controls could not prevent the use of respiratory protection.
How and why this make and model was chosen for this specific project.
The limitations of this make and model was chosen for this specific project.
How to put on this respirator and properly adjust the face piece and tension straps.
How to wear this respirator properly.
What the essential points of the care and maintenance of this respirator are.

How to recognize and handle emergencies which may occur while using this respirator.

How to properly inspect, clean, and disinfect this respirator.

How to properly use an Air Purifying Respirator.

When a Type-C Supplied-air respirator is required.

The purpose of medical evaluation.

How LiRo Engineers conducts a proper respirator fit-test.

That a Powered Air Purifying Respirator (PAPR) is available to you upon request, as long as it meets the protection factor for the hazard involved.

Employee's Signature: _____ Date:

EXHIBIT 4

LiRo Engineers, INC.

QUALITATIVE RESPIRATOR FIT TESTING

Date:

Employee Name: _____ (Last, First, Middle Intl.)

Age: _____Sex:

Years Experience: _____ Frequency: _____ **See Key

Mask Now Using: _____ Usual Conditions: _____ **See Key

Mask Selected: _____ (i.e. MSA, Half Mask, Medium)

Qualitative Tests: (PP) _____ (NP) _____ (IA) _____ (IS)

(1) = Passed (2) = Failed (3) = Did Not Run

IAA Sensitivity Test: _____ (Pass) or (Fail)

Smoke Sensitivity Test: _____ (Pass) or (Fail)

Respirator Selection: 1st Choice: _____ (Pass) or (Fail)

2nd Choice: _____ (Pass) or (Fail)

3rd Choice: _____ (Pass) or (Fail)

Final Selection: _____ (Pass) or (Fail)
(Manufacturer/Size)

Test Instructor: _____ Employee Signature:

Comments: Facial Conditions:

( ) Wrinkles	( ) Wide-Bridge
( ) Broken Nose	( ) Shallow-Bridge
( ) Deep Nostrils	( ) Small Face
( ) Narrow Face	( ) Wide Face
( ) Other	

Frequency:
How many times
used during a week:
(1) Less than 1/Week
(2) 2-5 Times/Week
(3) 5-10 Times/Week
(4) 1-4 Times/Day

Usual Conditions:
(1) Beard/Heavy
(2) Beard/Light
(3) Scars
(4) Wrinkles
(5) Glasses
(6) Several Days Beard Growth

Qualitative Tests:
PP - Positive Pressure
NP - Negative Pressure
IA - Isoamyl Acetal
IS - Irritant Smoke

EXHIBIT 5

RESPIRATOR INSPECTION CHART

Item	Half Face APR	Full Face APR	PAPR	Type C	SCBA
FACE PIECE					
Dirt or debris	X	X	X	X	X
Cracks, tears or holes	X	X	X	X	X
Distortion	X	X	X	X	X
Cracked or scratched lens		X	X	X	X
Looseness of parts	X	X	X	X	X
HEAD STRAPS					
Break or tears	X	X	X	X	X
Loss of elasticity	X	X	X	X	X
Broken or malfunctioning buckles	X	X	X	X	X
VALVES					
Dirt or dust	X	X	X	X	X
Detergent residue	X	X	X	X	X
Distortion	X	X	X	X	X
Missing Pieces	X	X	X	X	X
Fit of valve set	X	X	X	X	X
FILTER/CARTRIDGES					
Proper one for intended use	X	X	X	X	X
Approval designation	X	X	X	X	X
Missing or worn gasket	X	X	X	X	X
Worn threads on filter	X	X	X	X	X
Worn threads on face piece	X	X	X	X	X
Cracks or dents	X	X	X		X
Missing or loose hose clamps	X	X	X		X

Item	Half Face APR	Full Face APR	PAPR	Type C	SCBA
COMPRESSORS					
Air Quality				X	
Breaks or kinks in supply hose				X	
Supply hose fittings				X	
Connections				X	
Regulator set properly and working				X	
Valves working correctly				X	
Carbon monoxide alarms				X	
High Temperature alarm				X	
Air-purifying elements					
TANKS					
Regulator					X
Valves					X
Reserves air system					X
Harness					X
PUMPS					
Motors			X		
Charging units			X		
Hoses			X		
Batteries			X		
Test gauges			X		
Power cords			X		
Belt holder			X		

APPENDIX D

LiRo Engineers, Inc.

PERSONNEL DECONTAMINATION PROCEDURES

APPENDIX D-1

LEVEL D DECONTAMINATION

Scrub outer boots and gloves with soap and water.

Rinse off soapy water from boots and gloves with clean water.

Remove outer gloves and dispose in container or store in decon zone for later use.

Wash hands and face as soon as possible.

Equipment - 30 gallon tub
soapy water
fresh water
long handle brush
garbage can with plastic linear

APPENDIX D-2

LEVEL C DECONTAMINATION

Deposit equipment used onsite (tools, sampling devices, and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different designated containers with plastic liners.

Scrub outer boots and gloves with decon solution or detergent/water.

Rinse off decon solution using copious amounts of water. Repeat as many times as necessary.

Remove tape around boots and gloves and deposit in container with plastic liner.

Remove boot covers and deposit in container with plastic liner.

Remove outer gloves and deposit in container with plastic liner.

Remove disposable suit. Deposit in container with plastic liner.

Remove face piece. Avoid touching face with gloves. Wash respirator with spray cleaner and paper towels, and store in plastic liner.

Remove inner gloves and deposit in container with plastic liner.

Wash hands and face as soon as possible.

Equipment - container (20-30 gallons)
decon solution or detergent/water
long handle, soft bristle scrub brushes
container (30-50 gallons) or spray unit
clean water

plastic liners

APPENDIX D-3

LEVEL B DECONTAMINATION

Deposit equipment used onsite (tools, sampling devices, and containers, monitoring instruments, radios, clipboards, etc.) On plastic drop cloths or in different designated containers with plastic liners.

Scrub outer boots and gloves with decon solution or detergent/water.

Rinse off decon solution using copious amounts of water. Repeat as many times as necessary.

Remove tape around boots and gloves and deposit in container with plastic liner.

Remove boot covers and deposit in container with plastic liner.

Remove outer gloves and deposit in container with plastic liner.

Remove SCBA back pack / air line harness and wash with a spray cleaner, paper towels and store in plastic liner

Remove disposable suit. Deposit in container with plastic liner.

Remove face piece. Avoid touching face with gloves. Wash respirator with spray cleaner and paper towels, and store in plastic liner.

Remove inner gloves and deposit in container with plastic liner.

Wash hands and face as soon as possible.

Equipment - container (20-30 gallons)
decon solution or detergent/water
long handle, soft bristle scrub brushes
container (30-50 gallons) or spray unit
clean water
plastic liners

APPENDIX E

LiRo ENGINEERS, Inc.

WASTE MANAGEMENT
AND SPILL CONTROL PLAN

LiRo ENGINEERS, INC.

WASTE MANAGEMENT
AND SPILL CONTROL PLAN

LiRo Engineers Hazardous Waste Management Procedures are prepared in writing on a site specific basis by the Project Manager/Competent Person.

The following list of topics can be used by the competent person as a guide in the preparation of the site specific plan. Additionally, the competent person will also consult with the LiRo Engineers procedures for Hazard Communication Standard, Respiratory Protection, and PPE Sections.

1. Obtain MSDS Sheets for each waste encountered. Follow all safety precautions, PPE, handling procedures, and training as detailed on the MSDS.

2. Refer to OSHA Regulations, TSCA, RCRA and CRCLA Regulations for laws governing the handling/disposal of specific types of hazardous substances.

3. Follow the Site Specific Safety and Health Plan for handling hazardous waste. Use only certified/trained/authorized personnel to handle hazardous waste.

4. Utilize the proper drums/containers for the specific waste encountered. Refer to 40 CFR 260-272 and 300 and DOT Regulations 49 CFR Parts 171-178.

5. Provide sufficient quantity of the proper labels, and ID tags to identify the wastes in the containers. Use appropriate warning signs around the on-site staging area.

6. Maintain a suitable quantity of absorbent materials and fire extinguishers in event of a spill, leak, or discharge. The emergency spill materials shall be located in close proximity to the staging area.

7. The staging area shall include a “secondary containment” around the drums/containers.

8. Drums/containers shall be stored in a neat and orderly manner. Containers shall be segregated by waste type. Do not

co-mingle waste on site.

9. The generation of hazardous waste shall be minimized. Care shall be taken to not cross-contaminate waste on site.

10. Do not overfill or overpack a given container beyond its rated capacity. Allow for expansion/contraction due to freeze/thaw temperature changes. Do not overload roll-off, gondolas, or railroad cars.

11. A written log with the date and quantity of waste generated on site shall be kept by the Project Foreman/Competent Person.

12. The Site Specific Hazardous Waste Management Procedures shall be covered at the Weekly/Daily Tool Box Talks held on site with all employees who may be near or handling the waste on site. Each employee shall acknowledge their understanding of the procedures by signing the tool box talk meeting minutes. Copies of procedures shall be posted on site and readily available personnel.

The transportation and disposal of hazardous waste from a LiRo Engineers environmental remediation project is performed only through licensed, certified, trained and permitted 3rd party subcontractors.

The following guide is used to insure the use of qualified subcontractor to be used for the disposition of hazardous wastes:

1. Obtain copies of all waste characterization reports from a qualified/licensed laboratory.

2. Obtain copies of all permits for both the waste transporters and the T.S.D.F. (Make sure the waste being disposed of is on their permit and their permits have not expired).

3. Obtain written approval from the T.S.D.S. to accept the waste.

4. Obtain a certificate of insurance for General Liability, Workman's Comp, and auto for each transporter and T.S.D.F. LiRo Engineers is to be named additional insured on all policies/certificates. All original certificates are to be sent to LiRo Engineer's main office.

5. Fill out the Waste Manifest Transport/Disposal Form provided by the T.S.D.F. Facility. Obtain signatures from the generator prior to shipment (in no case shall LiRo Engineers act or sign on behalf of the generator of hazardous waste).

6. A Summary Log showing the date, transporter, T.S.D.F, quantity and waste type shall be maintained at the site for future reference and tracking.

SPILL CONTROL & CONTINGENCY PLAN

LiRo Engineer's Spill Control & Contingency Plan (SCP) details procedures for the diking/berming of contaminated liquid and/or fuel storage areas; the development of operating procedures to include spill prevention design; and the training of employees in spill prevention and control techniques.

In the event of a spill, LiRo Engineers will implement the following flexible spill response:

1. *First aid will be administered to injured/contaminated persons*. Any LiRo Engineers employee observing a spill will act immediately to remove and/or protect injured/contaminated persons from any life-threatening situation. First aid and/or decontamination procedures who are familiar with spill control and cleanup.

2. *Warn unsuspecting persons/vehicles of the hazard*. LiRo Engineers personnel will act to prevent any unexpecting persons from coming in contact with spilled materials by alerting other nearby persons and by obtaining assistance of other LiRo Engineers personnel who are familiar with spill control and cleanup.

3. *Stop the spill at the source, if possible*. Without taking unnecessary risks, LiRo Engineers personnel will attempt to stop the spill at the source. This may involve activities such as uprighting a drum, closing a valve, or temporarily sealing a hole with a plug.

4. *Notify LiRo Engineers Project Manager/Competent Person*. Utilizing available radio communications or other rapid communication procedures. The Project Manager will be notified of the spill, including information on material spilled, quantity, personnel injuries, and immediate life-threatening hazards.

5. *Spill assessment and primary containment*. The competent person will make rapid assessment of the spill and direct primary containment measures. Depending upon the nature of the spill, primary containment measures may include, but are not limited to:

    - Constructing a temporary berm to control the horizontal flow of the spill using absorption pads, booms, sandbags, or inert material.

    - Placing drums under the leak to collect the spilling material before it flows over the ground.

    - Transferring the material from its original container to another container.

6. *Notify the Customer*.

7. *Spill cleanup procedure*. LiRo Engineers will develop a spill cleanup procedure taking into consideration associated hazards, and quantity of spilled material.

8. *Spill cleanup inspection*. The Project Manager and customer will jointly inspect the spill to determine that the spill has been cleaned up to the satisfaction of the client.

A Spill Report Form must be completed by the Project Manager, and submitted to Corporate Management within 24 hours of the incident.

LiRo ENGINEERS, INC.

EMISSION - SPILL - DISCHARGE REPORT

Job: _____ Date/Time:

Location:

Superintendent:

This form must be completed if any spill occurs on company or customer premises.

Substance(s) Spilled/Discharged:
Actions Taken to Control Spill/Discharge:
Amount Spilled/Discharged:

Reported By:
Report Reviewed By:
Date Report Sent to Owner:
Names of Persons Receiving Report:

COMMUNITY AIR MONITORING PLAN
for the

Western New York Workforce Training Center

683 Northland Avenue

Buffalo, New York

Prepared for:

NorDel II, LLC

Prepared by:

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, NY 14209

December 2016

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List of Appendices

1.0 OBJECTIVE

The objective of environmental/ambient air monitoring during this project is to monitor air quality during the Remedial Investigation (RI) to be conducted at the 683 Northland Avenue Site in Buffalo, Erie County, New York (the "Site"). The air quality will be monitored during any drilling, well construction, and soil vapor probe installation activities in order to provide a measure of protection for the community from potential airborne contaminant releases as a result of remedial investigation work activities. Air monitoring for Volatile Organic Compounds (VOCs) and particulates (particulate matter less than 10 microns in size) (PM-10) will be conducted upwind of work areas (exclusion zone) to establish background conditions and downwind of the exclusion zone to monitor possible contaminant migration. Environmental air monitoring and observations of visible emissions during investigation activities will be performed according to the methods contained in this plan.

2.0 METHODOLOGY

2.1 Daily Monitoring Guidelines

Air monitoring will be performed continuously at the Site for the duration of the RI whenever Site activity involves ground intrusive activity, which as outlined in the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (attached as Appendix A), is defined to include, but not limited to soil/waste excavation and handling, trenching or test pits and the installation of soil borings or monitoring wells. For the RI at the Site, intrusive activity shall include drilling, well construction, soil vapor installation, or any activity with the potential to emit VOCs or PM-10.

Prior to each day's work, LiRo's supervising geologist will enter the exclusion zone(s) to identify areas of high emission potential, i.e., areas of drilling, well construction, soil vapor probe installation, etc., and to collect temperature and wind direction readings. Once wind direction and areas of high emission potential have been established, the supervising geologist will set up the upwind and downwind monitoring equipment. At this point, collection of real-time readings for VOCs and particulates will be initiated at both the upwind and downwind

monitoring locations. Depending on the planned daily site work, up to two downwind monitoring stations will be utilized. Site work may commence after air monitoring has been initiated.

Once excavation work begins, the supervising geologist will evaluate the work areas for visible particulates in the air and suppression measures being applied by the excavation contractor. This is in addition to the mechanical and regular data logging of VOC and particulate levels. Based on the air monitoring results, the supervising geologist may order a stoppage of the work or require modified work practices to reduce emissions.

Periodically throughout the day the location of excavation work or the general wind direction may change. When this occurs a new exclusion zone evaluation must be conducted. This would include an evaluation of wind direction in order to establish upwind and downwind directions, and continuous monitoring of VOCs and particulates in upwind and downwind locations.

2.2 Air Sampling Methodology and Equipment

Air monitoring for VOCs and particulates will be performed at upwind and downwind locations. One upwind and up to two downwind monitoring stations will be employed, as necessary, to provide sufficient coverage of intrusive activities that have the potential to emit volatile organics or dust. Each monitoring station will comprise real-time air monitoring instruments. The specific air monitoring equipment is summarized in Table 1. The equipment, which will be field calibrated prior to each days use, will be capable of calculating 15-minute running average or less concentrations for comparison to appropriate action levels.

Table 1 – Air Monitoring Equipment

Analyte	Sampling Method	Duration	Comments
VOCs	MiniRAE 3000	Continuously, upwind and downwind of exclusion zone during work hours	Real Time Analysis
Particulates (PM-10)	TSI DustTRAK Aerosal Monitor	Continuously, upwind and downwind of exclusion zone during work hours	Real Time Analysis

As shown in Table 1, each air monitoring station will include a MiniRAE 3000 (PID) (or equivalent) for VOCs and TSI DustTRAK Aerosol Monitor (or equivalent) for particulates. The upwind monitoring station will also include a meteorological station capable of recording, at a minimum, wind speed and direction.

3.0 AIR MONITORING DATA EVALUATION

3.1 Air Quality Action Levels and Responses

Action levels for VOC concentrations will be based on the NYSDOH Generic Community Air Monitoring Plan. The initial threshold for VOC action is 5 parts per million (ppm). The ambient air concentration of total VOCs at the downwind perimeter of the exclusion zone exceeds 5 ppm above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total VOCs level readily decrease below 5 ppm over background, work activities can resume with continued monitoring.

If total VOC levels at the downwind perimeter of the work area of 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 implemented to abate emissions, and monitoring continued. After this, work activities can resume provided that the total VOC concentration downwind of the exclusion zone is below 5 ppm over background for the 15-minute average. It the VOC level is above 25 ppm at the downwind monitoring location, activities will be shut down.

Particulate (PM-10) concentrations will also be compared to Action Levels and responded to, as outlined in the NYSDOH Generic Community Air Monitoring Plan. The initial threshold for particulate/dust action is 100 micrograms per cubic meter (ug/m^3). If the downwind particulate level is 100 mg/m^3 greater than the background (upwind) level for the 15-minute average 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

particulate levels do not exceed 150 ug/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

If dust suppression techniques have been employed and downwind particulate levels are greater than 150 ug/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 particulate concentration to within 150 mg/m^3 of the upwind level and in preventing visible dust migration.

All 15-minute averages will be datalogged at one-minute intervals and maintained for review by New York State Department of Environmental Conservation (NYSDEC) and NYSDOH personnel.

3.2 Notification

The NYSDEC will be promptly notified prior to any modification of the CAMP and of any corrective actions required for CAMP compliance, and VOC and particulate monitoring.

APPENDIX A

NYSDOH GENERIC COMMUNITY AIR MONITORING PLAN

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

ATTACHMENT 6

Citizens Participation Plan (CPP) – ON CD

New York State Department of Environmental Conservation Brownfield Cleanup Program

CITIZEN PARTICIPATION PLAN
For the
Western New York Workforce Training Center

683 Northland Avenue
Buffalo, New York

NYSDEC Site No. C915310

December 1, 2016

Prepared for:

NorDel II, LLC
95 Perry Street
Suite 404
Buffalo, New York 14203

Prepared by:

LiRo Engineers, Inc.
690 Delaware Avenue
Buffalo, New York 11356

CITIZEN PARTICIPATION PLAN

WESTERN NEW YORK WORKFORCE TRAINING CENTER

NYSDEC SITE NO. C915310

683 NORTHLAND AVENUE

BUFFALO, NEW YORK

December 2016

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*** * * * ***

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the Site's investigation and cleanup process.

Applicant: **NORDEL II LLC**
Site Name: **Western New York Workforce Training Center**
Site Address: **683 Northland Avenue, Buffalo, NY**
Site County: **Erie**
Site Number: **C915310**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with property owners and developers to encourage the voluntary cleanup of properties known as "brownfields."

A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental impacts. The presence or potential presence of contamination can affect the use of the property.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants that conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and may include cleanup activity, ensuring protection of public health and the environment.

For more information about the BCP, go online at: http://www.dec.ny.gov/chemical/8450.html .

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important
NYSDEC involves the public to improve the process of investigating and cleaning up contaminated properties, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interested in investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective investigation and cleanup programs that protect public health and the environment.
- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process.
- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process.
- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community.

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified and defined herein (Site). The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the Site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the Site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the Site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the Site and by other means, as appropriate.

Site Contact List

Appendix B contains the Site contact list. This list has been developed to keep the community informed about, and involved in, the Site's investigation and cleanup process. The Site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the Site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.

The Site contact list includes, at a minimum:

- chief executive officer and planning board chairperson of each county, city, town and village in which the Site is located;
- residents[1], owners, and occupants of the Site and properties adjacent to the Site;
- the public water supplier which services the area in which the Site is located;
- any person who has requested to be placed on the Site contact list;
- the administrator of any school or day care facility located on or near the Site for purposes of posting and/or dissemination of information at the facility;
- location(s) of reports and information.

[1] Residential contacts are maintained by NYSDEC in a separate document.

The Site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the Site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the Site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

CP Activities

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the Site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the Site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.
- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the Site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the Site contact list and changes in planned citizen participation activities.

Technical Assistance Grant

NYSDEC must determine if the Site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the Site, as described in Section 5.

If the Site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the Site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the Site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the Site.

For more information about TAGs, go online at http://www.dec.ny.gov/regulations/2590.html

Note: The table identifying the citizen participation activities related to the Site's investigation and cleanup program follows on the next page:

Citizen Participation Activities

Citizen Participation Requirements (Activities)	Timing of CP Activity(ies)
Application Process:	
• Prepare Site contact list • Establish document repositories	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to Site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the Site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement:	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to Site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to Site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to Site contact list about proposed RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action:	
• Distribute fact sheet to Site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to Site contact list that announces that cleanup action has been completed and that summarizes the Final Engineering Report • Distribute fact sheet to Site contact list announcing issuance of Certificate of Completion (COC)	At the time NYSDEC approves Final Engineering Report. These two fact sheets are combined if possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the Site. Additional major issues of public concern may be identified during the course of the Site's investigation process.

Historical operations at the Site have led to impacted soil at the Site. Impacts to Site soils include semi-volatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs). Other Site concerns with regards to re-development plans include oil-impacted wooden block floors, aboveground and underground storage tanks (ASTs/USTs), potentially impacted pits and sumps, transformers/electrical switch gears, lead-based paint (LBP), asbestos containing material (ACM), and mold.

In addition, previous investigations at the Site have not evaluated the extent of the Site impacts to groundwater, surface soil, or soil vapor. Groundwater at the Site is not used as a potable drinking water supply. The Site and the City of Buffalo are serviced by a municipal water supply.

4. Site Information

The subject Site is located on Northland Avenue in Buffalo, New York, within the City of Buffalo, New York. Appendix C contains a map (Figure 1) identifying the location of the Site. The Site is approximately 7.25 acres in size. The Site is developed with an approximately 235,000 square foot factory building complex which comprises a four-story office area on the north side along Northland Avenue, a series of connecting ten manufacturing spaces and a detached one-story shed located on the west side of the facility. The former Niagara Machine and Tool Co. industrial complex is located on the south side of Northland Avenue between Chelsea Place and Longview Avenue. The Site is located in an urban setting, with parking areas along Northland Avenue north of the Site and commercial/industrial properties along Northland Avenue to the east and west of the Site. The Site is bordered to the south by the New York Central Railroad. Currently, the Site is vacant and was most recently use for miscellaneous storage.

The building complex was developed from numerous building expansions between 1911 through 1983. Niagara Machine and Tool primarily manufactured tools and machines for working with sheet metal, specializing in presses, punches, and rotary sheets at the Site. Operations at the plant included welding, steel fabricating, forging, and machining. The office portion of the building (approximately 35,000 square feet) of the former manufacturing area is slated for re-use as the Western New York Workforce Training Center to be funded from Governor Andrew Cuomo's "Buffalo Billion" re-development initiative and the New York Power Authority (NYPA). This re-use will require cleaning and stabilization of the manufacturing portion of the structure and improvements to the office building to support training center operations. The work would include asbestos abatement, select demolition/removal of contaminated wood block flooring and unneeded equipment, industrial cleaning, brick repair, and roof, door, and window replacement.

As part of the Site re-development, the following investigations have been completed: a Phase I Environmental Site Assessment (ESA) (January 2015); a Phase II ESA (September 2015); and, a Supplemental Assessment (January 2016). During the Phase I ESA, numerous Recognized Environmental Concerns (RECs) were identified. These included oil-impacted wooden block floors, ASTs/USTs, potentially impacted pits and sumps, transformers/electrical switch gears, LBP, ACM, and mold.

Site investigations have identified soil contamination in the exterior area west of the building, contaminated sediment/soil and liquids within pits, and contaminated wood flooring and concrete subflooring.

NorDel II, LLC has applied to enter into a Brownfields Cleanup Agreement with NYSDEC to further investigate and/or remediate contamination to the Site soil and groundwater.

The Site is located in the Erie-Ontario Lowlands physiographic province of New York State. Low plains with little relief characterize the province with glacial deposition and shoreline deposits having modified topography. The Site lies at approximately 645 feet above mean sea level. Depth to groundwater is between 4 to 12 feet below ground surface (ft bgs) and is estimated to flow from northeast to southwest. Soil borings advanced during the Phase II ESA indicate fill material was observed across the Site ranging at depths of 2 to 14 ft bgs. The fill material consisted of a fine to coarse sand, silt, clay, and gravel. Below the fill material were natural deposits of brown silty clay.

Delineation of the impacts to soil, soil vapor, and groundwater will be one of the goals of the remedial investigation to be conducted as part of the BCP process.

5. Investigation and Cleanup Process

The Applicant is applying for acceptance into New York's BCP. The Participant must fully characterize the nature and extent of contamination on the Site, as well as the nature and extent of contamination that has migrated from the Site.

The Applicant in its application proposes that the Site will be used for re-development purposes. To achieve this goal, the applicant will conduct investigation activities at the Site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the Site.

Investigation

The Applicant will conduct an investigation of the Site officially called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation work plan, which is subject to public comment.

The Site investigation has several goals:

1) Delineate the extent of PCB, SVOC, and metal soil contamination in exterior area along the western margin of the Site;
2) Delineate the extent of lead contaminated soil near interior boring ASB-08;
3) Conduct additional borings for more complete characterization of subsurface soil contamination;
4) Install groundwater monitoring wells to evaluate potential contamination and determine Site hydrological conditions;
5) Collect sub-slab vapor data and soil vapor data to evaluate potential soil vapor intrusion concerns; and
6) Collect surface soil samples from the only non-paved areas that are present at the Site. The grass areas in the northwestern portion of the Site area the only areas where surface soil is exposed.

The proposed Site investigation will include:

- Data compilation and review;
- Field investigation (groundwater, soil, and soil vapor sampling and laboratory analysis of samples) to determine the lateral and vertical extent of Site COCs;
- Comparison to applicable standards, criteria and guidelines; and
- Recommendations and reporting.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results. This report also will recommend whether cleanup action is needed to address Site-related contamination. The investigation report is subject to review and approval by NYSDEC.

NYSDEC will use the information in the investigation report to determine if the Site poses a significant threat to public health or the environment. If the Site is a significant threat, it must be cleaned up using a remedy selected by the NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the Site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Remedy Selection

When the investigation of the Site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the Site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a Certificate of Completion (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address Site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a Remedial Action Work Plan (RAWP). The RAWP describes the Applicant's proposed remedy for addressing contamination related to the

Site.

When the Applicant submits a proposed RAWP for approval, NYSDEC would announce the availability of the proposed plan for public review during a 45-day public comment period.

Cleanup Action
NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy.

The Applicant may then design and perform the cleanup action to address the Site contamination. NYSDEC and NYSDOH oversee cleanup activities. When the Applicant completes cleanup activities, it will prepare a final engineering report that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the Site.

Certificate of Completion
When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the Site, it will approve the final engineering report. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for Site-related contamination, subject to certain conditions.

Site Management
Site management is the last phase of the Site cleanup program. This phase begins when the COC is issued. Site management may be conducted by the Applicant under NYSDEC oversight, if contamination will remain in place. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the Site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan (SMP).

An institutional control is a non-physical restriction on use of the Site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the Site suitable for some, but not all uses.

An engineering control is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that is pumping and treating groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the Site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

Project Manager –
To Be Determined

Citizen Participation Specialist-
To Be Determined

New York State Department of Health (NYSDOH):

NYSDOH-
To Be Determined

The City of Buffalo:

The City of Buffalo
Mayor Byron W. Brown
201 City Hall
Buffalo, NY 14202
(716) 851-4841

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Buffalo and Erie County Public Library
Central (Downtown Buffalo) Branch
1 Lafayette Square
Buffalo, NY 14203

Appendix B: Site Contact List

County of Erie
Honorable Mark C. Poloncarz
Erie County Executive
95 Franklin Street
Buffalo, NY 14202

City of Buffalo Office of Strategic Planning
Brendan Mehaffy, Executive Director
920 City Hall
Buffalo, NY 14202

City of Buffalo Planning Board
Nadine Marrero, Director of Planning
901 City Hall
Buffalo, NY 14202

Erie County Water Authority
350 Ellicott Square Building
295 Main Street
Buffalo, NY 14203

Plesh Properties, LLC
701 Northland Avenue
Buffalo, NY 14127

Northland West, LLC
95 Perry Street
Suite 404
Buffalo, NY 14203

Buffalo News
1 News Plaza
Buffalo, NY 14240

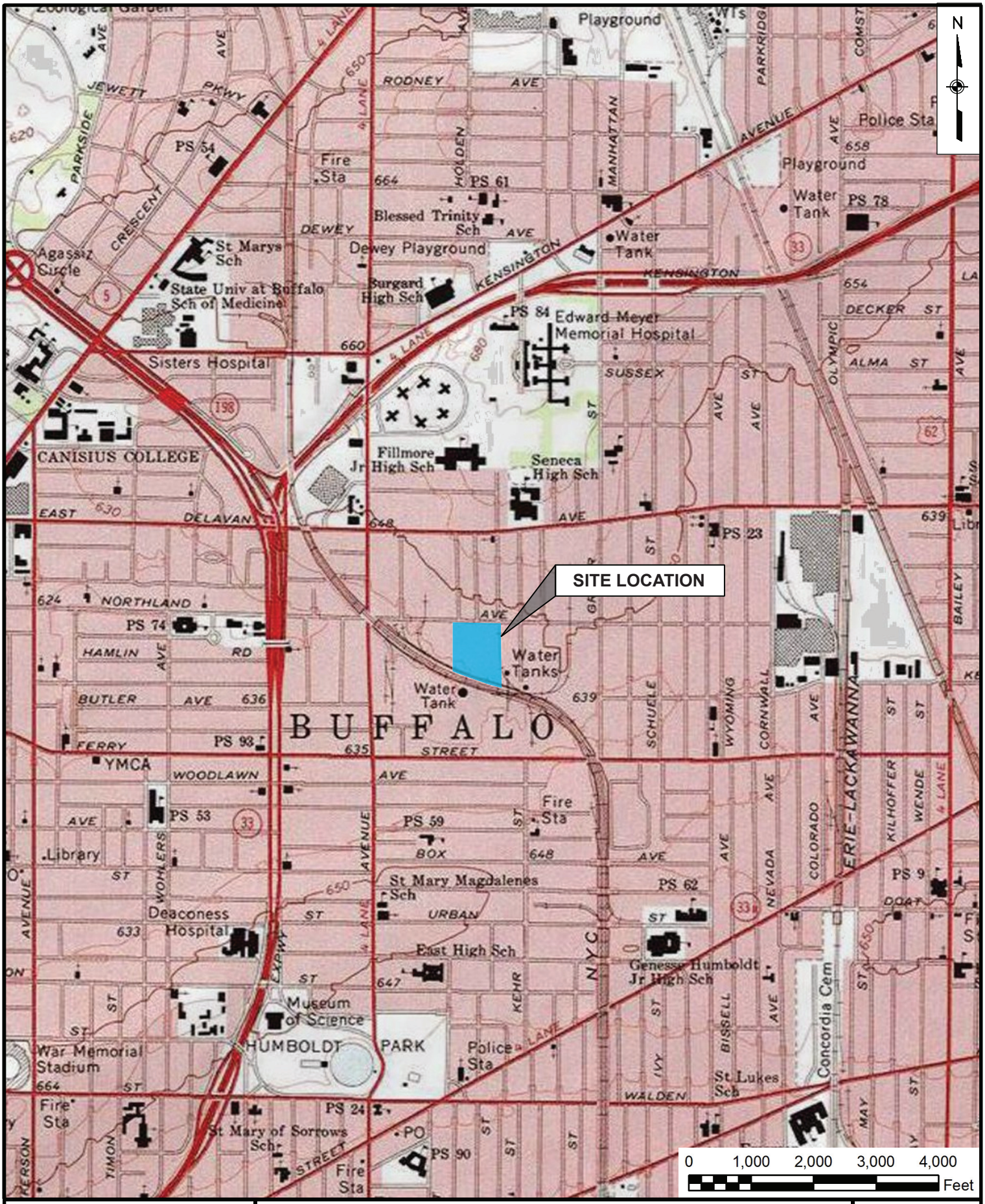
WGRZ TV
259 Delaware Avenue
Buffalo, NY 14207

WIVB TV
2077 Elmwood Avenue
Buffalo, NY 14207

WKBW TV
7 Broadcast Plaza
Buffalo, NY 14202

Note: A residential Site contact list will be maintained by NYSDEC under separate cover.

Appendix C
Site Location Map



LiRo-Engineers, Inc.
690 Delaware Ave.
Buffalo, New York

683 NORTHLAND AVENUE
TOPOGRAPHIC SITE LOCATION MAP

FIGURE NO.

1

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Appendix D
Brownfield Cleanup Program

Appendix D– Brownfield Cleanup Program Process