93 MAIN STREET
BINGHAMTON, BROOME COUNTY, NEW YORK
Site Management Plan

NYSDEC Site Number: 7-04-027

Prepared for:
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7017

Prepared by:
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Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date
1	2/13/2013	EVALUATION OF VAPOR INTRUSION FOR ANY BUILDING ONSITE	2/13/2013

AUGUST 2012

93 Main Street
Binghamton, Broome County, New York
Site Management Plan
Revision #1

1) On page 11, second bullet - The potential for vapor intrusion must be evaluated for any building developed in the former excavation areas shown on Figure 3, and any potential impacts that are identified must be monitored or mitigated.

   Replace with: The potential for vapor intrusion must be evaluated for any buildings developed on site.

- Monitoring well decommissioning procedures
- Annual inspection and periodic certification.

Quarterly monitoring of the performance of the remedy and overall reduction in contamination onsite will be conducted for the first year. The frequency thereafter will be determined by NYSDEC. Trends in contaminant levels in air, soil, and/or groundwater in the affected areas, will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in the table below and outlined in detail in Sections 3.2 and 3.3.

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Monitoring/Inspection Schedule			
Monitoring Program	**Frequency[a]**	**Matrix**	**Analysis**
Groundwater	Quarterly (for first year)	Water	Pesticides and Herbicides
Site Inspection	Quarterly (for first year)	NA	NA
(a) The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH			

3.2 COVER SYSTEM MONITORING

For the first year of monitoring, the cover system will be inspected on a quarterly basis and after large storm events to ensure proper drainage and to look for erosion and sedimentation issues. The inspector will also note whether the cover has been disturbed. There is no vegetative cover in the excavation area, but grass planted along the adjacent property boundary shall be inspected to make sure it is growing in fully.

3.3 MEDIA MONITORING PROGRAM

Groundwater is the only media that will be monitored at this site.

3.3.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy and to document the attenuation of residual groundwater contamination.

The network of monitoring wells has been installed to monitor both upgradient and downgradient groundwater conditions at the site. The network of onsite and offsite wells was designed during the two RI phases and the pre-design investigation phase of the project. Six monitoring wells were installed during Phase I of the RI based on site topography. During Phase II, four more wells were installed based on site topography and information gathered during Phase I gauging and sampling events. During the pre-design investigation two additional wells were installed near the former floor drain location. Of the wells installed at the site, one was dry and two were within the

require compliance with this SMP and all ECs and ICs placed on the site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for onsite controls. This SMP specifies the methods to be implemented to ensure compliance with established ECs and ICs required by the environmental easement for the contamination that remains at the site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the environmental easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the site after completion of the remedial action, including: (1) implementation and management of all EC/ICs; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) an EC/IC Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of site monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual for complex systems).

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the environmental easement. Failure to properly implement the SMP is a violation of the environmental easement and grounds for revocation of the Certificate of Completion.

- Failure to comply with this SMP is also a violation of ECL, 6 New York Code of Rules and Regulations (NYCRR) Part 375 and, thereby, subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan shall be proposed in writing to the NYSDEC's project manager. In accordance with the environmental easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP and append these notices to the SMP that is retained in its files.

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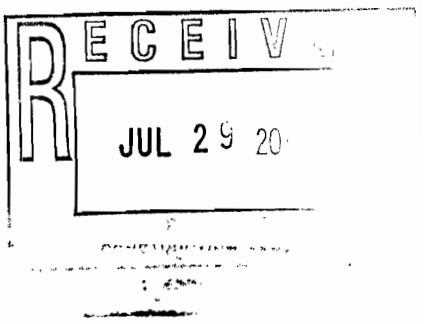

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JULY 2011

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SITE MANAGEMENT PLAN

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

This document is required as an element of the remedial program at 93 Main Street (hereinafter referred to as the "Site") administered under the New York State Department of Environmental Conservation (NYSDEC) State Superfund site (Site No. 704027). The site was remediated in accordance with NYSDEC Division of Environmental Remediation (DER)-10 and Contract Document D00698 dated July 2009.

1.1.1 General

EA Engineering, P.C. and its affiliate EA Science and Technology (EA), under a standby contract with the NYSDEC, provided remedial construction management services for a 1-acre property located in Binghamton, Broome County, New York. The NYSDEC investigated and remediated contaminated media at the site under the state superfund program. Horizon Environmental provided construction services under contract with the NYSDEC and in accordance with Construction Documents D006987. A figure showing the site location and boundaries of this 1 acre site is provided in Figure 1. The boundaries of the site will be more fully described in the metes and bounds site description as part of the environmental easement. This will be provided in a future revision of this plan.

After completion of the remedial work described in the Contract Documents, some contamination was left in the subsurface at this site, which is hereafter referred to as 'remaining contamination." This Site Management Plan (SMP) was prepared to manage remaining contamination at the site until the environmental easement is established in accordance with Environmental Conservation Law (ECL) Article 71, Title 36. All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in NYS.

This SMP was prepared by EA, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the institutional controls (ICs) and engineering controls (ECs) that are required by the environmental easement for the site.

1.1.2 Purpose

After completion of the remedial action the site still contains remaining contamination. To ensure protection of public health and the environment ECs have been incorporated into the site remedy to control exposure to remaining contamination. An environmental easement granted to the NYSDEC, and recorded with the Broome County Clerk, will

require compliance with this SMP and all ECs and ICs placed on the site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for onsite controls. This SMP specifies the methods to be implemented to ensure compliance with established ECs and ICs required by the environmental easement for the contamination that remains at the site. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the environmental easement and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the site after completion of the remedial action, including: (1) implementation and management of all EC/ICs; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) an EC/IC Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of site monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual for complex systems).

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the environmental easement. Failure to properly implement the SMP is a violation of the environmental easement and grounds for revocation of the Certificate of Completion.

- Failure to comply with this SMP is also a violation of ECL, 6 New York Code of Rules and Regulations (NYCRR) Part 375 and, thereby, subject to applicable penalties.

1.1.3 Revisions

Revisions to this plan shall be proposed in writing to the NYSDEC's project manager. In accordance with the environmental easement for the site, the NYSDEC will provide a notice of any approved changes to the SMP and append these notices to the SMP that is retained in its files.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The site is located in the city of Binghamton, Broome County, New York and is identified as Block 2 and Lots 32, 33, 38 and 38.2 on the Binghamton Tax Map #160.38. The site is an approximately 1-acre area bounded by Main Street to the north, residential property to the south, Arthur Street and commercial property to the east, and a residential/commercial property to the west (Figure 1). The boundaries of the site will be more fully described in the Metes and Bounds site description.

1.2.2 Site History

The McMahon Brothers Pest Control Company was operating as pesticide/herbicide storage and handling facility on the site from the 1950s to the 1980s. Spills may have taken place at the site during this time. After pest control operations ceased, the building was converted to apartments.

In 1995, a Phase II investigation was completed by Gaynor Associates of Cortland, New York for a financial institution. During the investigation, elevated concentrations of herbicides and pesticides were identified in the subsurface soil. Strong pesticide odors were noted in the vacant apartments. As a result of this investigation and other complaints, the city of Binghamton entered into a Voluntary Cleanup Agreement with the NYSDEC to perform a limited investigation of the site. Soil and groundwater from the rear of the existing building was sampled and revealed elevated concentrations of pesticides/herbicides.

In October 1998, NYSDEC initiated a Remedial Investigation (RI)/Feasibility Study (FS) at the site to define the nature and extent of the contamination and to develop remedial alternatives which would be protective of human health and the environment. The Record of Decision (ROD) was issued by the NYSDEC in 2000, and was amended in 2007 to include excavation and off-site disposal of contaminated soils. In 2009, contract documents were approved by the NYSDEC to implement the remedial action selected in the amended ROD.

1.2.3 Geologic Conditions

A review of the geologic map of New York, Finger Lakes Sheet published by the University of the State of New York, the State Education Department, dated 1970, indicates that bedrock in the Binghamton area is made up of units of the Sonyea Group including the Cashaqua Shale and Middlesex Shale to the west; and the Rye Point Shale, Rockstream Siltsone, Pulteney, Sawmill Creek, Johns Creek and Montour Shales to the east. These units consist of stratified units of sedimentary bedrock from the upper Devonian and can be up to 1,000-ft thick. The site is overlain with unconsolidated glacial deposits of silts, sands, and gravel.

Groundwater is approximately 23 ft below ground surface (bgs) onsite and it flows north-northeast across the site. Approximate groundwater flow direction is shown in Figure 2.

1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

A RI was performed to characterize the nature and extent of contamination at the site. The results of the RI are described in detail in the following reports:

- RI Report 93 Main Street Inactive Hazardous Waste Disposal Site, NYSDEC, January 2000.

Generally, the RI determined that site soils and groundwater contained volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), herbicides, and pesticides. Contaminated soils were mainly concentrated near a drywell that was discovered on the 89-91 Main Street property, around the floor drain of the 93 Main Street building, and under the former garage of the 93 Main Street property. Soil contamination was localized around the three source areas discussed above. Groundwater contamination was identified within the source areas and downgradient of the source areas, along the northeast boundary of the site. Off-site groundwater was not sampled or analyzed during the RI, so off-site migration was not determined. Below is a summary of site conditions when the RI was performed in 1998-1999.

Soil

Soil contamination at the site was mainly located around three source areas, as stated above: the drain found on the 93 Main Street property, beneath the former garage of the 93 Main Street property, and near the drywell on the 89-91 Main Street Property.

Floor Drain (93 Main Street)

The highest immunoassay results collected in the field were observed in the soil around the drain on the 93 Main Street property, located just southeast of the former garage. Chlordane was observed at concentrations greater than 0.6 parts per million (ppm), dichlorodiphenyltrichloroethane (DDT) was observed at concentrations ranging from 20 ppm to greater than 400 ppm, and 2,4-Dichlorophenoxyacetic acid was observed at concentrations ranging from 1.5 to 7.5 ppm. There were no samples collected for laboratory analysis corresponding to these locations. Contamination was detected from 4 ft bgs to 23 ft bgs, and radially 6 ft from the drain.

Garage Drain (93 Main Street)

The soil associated with the garage drain on the 93 Main Street property was investigated by installing soil boring through the concrete slab. The slab was later removed for further investigation. Soil samples collected from beneath the concrete slab were analyzed in a laboratory for pesticides. Soils collected contained alpha-BHC, gamma-BHC,

heptachlor, heptachlor epoxide, dieldrin, 4,4'-dichlorodiphenyldichloroethylene (4,4'-DDE), 4,4'-dichlorodiphenyldichloroethane (4,4'-DDD), 4,4'-DDT, and alpha- and gamma-chlordane above the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 criteria.

Dry Well (Associated with 89-91 Main Street Properties)

The dimensions of the drywell located on the 89-91 Main Street property were approximately 4-6 ft deep and 2-ft in diameter. A test pit was excavated in the area of the drywell and soil samples were collected for pesticide analysis. Soil samples contained elevated concentrations of heptachlor, aldrin, dieldrin, endrin, 4,4'-DDT, and gamma-chlordane in this area.

Site-Related Groundwater

Groundwater samples were collected from monitoring wells installed throughout the site and from three geoprobe locations. Pesticides were detected above the Technical and Operational Guidance Series (TOGS) 1.1.1 criteria in MW-6, located just downgradient from the garage drain, and MW-1 which is located further downgradient from MW-6. Monitoring well MW-6 contained the greatest concentrations of volatiles, semivolatiles, and pesticides. Monitoring well MW-1 contained only pesticides at elevated levels. Geoprobe location GP-39, located near the dry well, and GP-42, located halfway between MW-1 and MW-6, both contained groundwater with elevated concentrations of pesticides.

1.4 SUMMARY OF REMEDIAL ACTIONS

The site remediation activities were performed in accordance with the NYSDEC-approved Contract Documents dated July 2009. The following is a summary of the remedial actions performed at the site:

Three excavation areas as defined by the Contract Documents and Drawings were marked out in the field by a licensed surveyor. Soil samples were collected from each excavation area and characterized for disposal in accordance with the prospective disposal facilities. Excavation Area 2, as defined by the Contract Drawings, was characterized as non-hazardous. Soil excavated from that area was transported to the Ontario County Landfill. Excavation Areas 1 and 3 were characterized as hazardous soil and contained listed hazardous wastes, including chlordane, which required incineration. Soil from these excavations was transported to Bennett Incinerator of Quebec, Canada. Each excavation was backfilled using certified fill material from Bolands Excavating of Conklin, New York.

In addition to excavation and disposal/treatment of site soils, some monitoring wells were decommissioned as part of the site work. Monitoring wells MW-8, MW-5, and MW-6 were abandoned in accordance with the Contract Documents.

Major work items completed during the remedial construction include:

- Excavate and remove contaminated soil, as depicted on the Contract Drawings
- Backfill and compact excavations using approved backfill from an approved source
- Remove and dispose of waste and debris onsite
- Abandon existing wells
- Remove and dispose of drummed waste
- Remove and dispose of trees and vegetation as required

Remedial activities were completed at the site in December 2010.

Following remediation activities, long-term management of remaining contamination is set forth in this SMP, and as required by the environmental easement, which includes plans for: (1) IC/ECs, (2) monitoring, (3) operation and maintenance, and (4) reporting.

1.4.1 Removal of Contaminated Materials from the Site

Soil was removed from within the boundaries of the excavation areas identified on the Contract Drawings as described below. Documentation samples were collected from the bottom of each excavation. These samples served only to identify remaining contamination and were not intended to evaluate further excavation for disposal/treatment.

A total of 2,680 tons or 1,557 yd^3 of non-hazardous soil was excavated from Excavation Area 2 to a depth of 25 ft and disposed of at the Ontario County Landfill. A total of 1,790 tons or 964 yd^3 of hazardous soil was excavated from Excavation Area 1 to a depth of 25 ft and Excavation Area 3 to a depth of 23 ft. Soil from Excavation Areas 1 and 3 was disposed of at Bennett Incinerator. The non-hazardous soil was directly loaded into trucks from the excavation. The hazardous soil was stockpiled onsite prior to acceptance from the incineration facility.

Excavations were backfilled using approved backfill provided by Bolands Excavation. The bottom 2 ft of Excavation Area 2 was backfilled with stone due to groundwater. The remainder of Excavation Area 2, Excavation Area 1, and Excavation Area 3 were backfilled using general fill material. Backfill was compacted in 2-ft lifts using a drum roller. Backfill in Excavation Area 3 was compacted using the back of the excavator due to the small size of the excavation.

A list of the soil cleanup objectives (SCOs) for the primary contaminants of concern and applicable land use for this site (as defined by the 2007 amended ROD) is provided in Table 1. A figure showing areas where excavation was performed is shown in Figure 3.

1.4.2 Site-Related Treatment Systems

No long-term treatment systems were installed as part of the site remedy.

1.4.3 Remaining Contamination

Endpoint samples were collected from the bottom of each excavation prior to backfilling activities to document remaining contamination. Known remaining contamination exists at the bottom of Excavation Area 2, approximately 25 ft bgs. Remaining contaminants include 4,4' DDD, 4,4' DDE, 4,4' DDT, chlordane, dieldrin, endrin, and heptachlor.

Table 2 and Figure 3 summarize the results of all soil samples remaining at the site after completion of remedial action that exceed the Track 1 (unrestricted) SCOs.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 INTRODUCTION

2.1.1 General

Since remaining contaminated soil exists beneath the site, EC/ICs are required to protect human health and the environment. This EC/IC Plan describes the procedures for the implementation and management of all EC/ICs at the site. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of all EC/ICs on the site
- The basic implementation and intended role of each EC/IC
- A description of the key components of the ICs set forth in the environmental easement
- A description of the features to be evaluated during each required inspection and periodic review
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the Excavation Work Plan (EWP) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the site remedy, as determined by the NYSDEC.

2.2 ENGINEERING CONTROLS

2.2.1 Engineering Control Systems

2.2.1.1 Soil Cover

Exposure to remaining contamination in soil/fill at the site is prevented by a soil cover placed over the site. This cover is comprised of clean soil and gravel that provide protection against direct exposure to remaining contamination. The EWP that appears in Appendix A outlines the procedures required to be implemented in the event the cover

system is breached, penetrated, or temporarily removed; and any underlying remaining contamination is disturbed. Procedures for the inspection and maintenance of this cover are provided in the Operation and Maintenance Plan included in Section 4 of this SMP.

2.2.1.2 Monitoring Wells

Residual concentrations of contaminants in groundwater will be assessed using groundwater monitoring wells located onsite. Site groundwater monitoring will be discussed further in Section 3 of this SMP.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10. The remedial goals, as presented in the amended ROD are:

- Eliminate, to the extent practicable, off-site migration of groundwater that does not attain NYSDEC Class GA Ambient Water Quality Criteria.
- Reduce, control, or eliminate to the extent practicable the contamination present within the soils/waste on site.
- Eliminate the threat to the sole source aquifer by removing or treating the source of contamination and curtailing, to the extent possible, migration of contaminated groundwater off the site.
- Eliminate the potential for direct human or animal contact with the contaminated soils or groundwater at the site.
- Attain groundwater standards to the extent practicable.

2.2.2.1 Soil Cover

The soil cover is a permanent control, and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

2.2.2.2 Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Monitoring will continue until permission to discontinue is

granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment, and/or control measures will be evaluated.

2.3 INSTITUTIONAL CONTROLS

A series of ICs is required by the ROD and ROD Amendment to: (1) implement, maintain and monitor EC systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the site to "restricted-residential" uses only. Adherence to these ICs on the site will be required by the environmental easement and will be implemented under this SMP. These ICs are:

- Compliance with the environmental easement and this SMP by the Grantor and the Grantor's successors and assigns
- All ECs must be operated and maintained as specified in this SMP
- All ECs on the controlled property must be inspected at a frequency and in a manner defined in the SMP
- Groundwater monitoring must be performed as defined in this SMP
- Data and information pertinent to site management of the controlled property must be reported at the frequency and in a manner defined in this SMP.

ICs identified in the environmental easement may not be discontinued without an amendment to or extinguishment of the environmental easement.

The site has a series of ICs in the form of site restrictions. Adherence to these ICs is required by the environmental easement. Site restrictions that apply to the controlled property are:

- The property may only be used for restricted-residential use provided that the long-term EC/ICs included in this SMP are employed
- The property may not be used for a higher level of use, such as unrestricted use without additional remediation and amendment of the environmental easement, as approved by the NYSDEC
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP

- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for intended use

- The potential for vapor intrusion must be evaluated for any buildings developed in the former excavation areas shown on Figure 3, and any potential impacts that are identified must be monitored or mitigated

- Vegetable gardens and farming on the property are prohibited

- The site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the controlled property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such controlled property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.3.1 Excavation Work Plan

The site has been remediated for restricted-residential use. Any future intrusive work that will penetrate the soil cover or cap, or encounter or disturb the remaining contamination, including any modifications or repairs to the existing cover system will be performed in compliance with the EWP that is attached as Appendix A to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the site. A sample HASP is attached as Appendix B to this SMP that is in compliance with DER-10, 29 CFR 1910, 29 CFR 1926; and all other applicable federal, state, and local regulations as of June 2011. Based on future changes to state and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be prepared and submitted with the notification provided in Section A-1 of the EWP. Any intrusive construction work will be performed in compliance with the EWP, HASP, and CAMP; and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (Section 5).

The site owner and associated parties preparing the remedial documents submitted to the state, and parties performing this work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of IDW generated during excavation, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as

building foundations and bridge footings). The site owner will ensure that site development activities will not interfere with, or otherwise impair or compromise, the ECs described in this SMP.

2.3.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures on the site, an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system shall at a minimum include a vapor barrier and passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and New York State Department of Health (NYSDOH) for approval. This work plan shall be developed in accordance with the most recent NYSDOH Guidance for Evaluating Vapor Intrusion in the State of New York. Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

2.4 INSPECTIONS AND NOTIFICATIONS

2.4.1 Inspections

Inspections of all remedial components installed at the site will be conducted at the frequency specified in the SMP Monitoring Plan schedule, provided in Section 3.1.2. A comprehensive site-wide inspection will be conducted annually, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed
- If these controls continue to be protective of human health and the environment
- Compliance with requirements of this SMP and the environmental easement

- Achievement of remedial performance criteria
- Sampling and analysis of appropriate media during monitoring events
- If site records are complete and up to date
- Changes, or needed changes, to the remedial or monitoring system.

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3). The reporting requirements are outlined in the Periodic Review Reporting section of this plan (Section 5).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the site by a qualified environmental professional as determined by NYSDEC.

2.4.2 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the 6 NYCRR Part 375, and/or ECL.
- 15-day advance notice of any proposed ground-intrusive activities pursuant to the EWP.
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other ECs and likewise any action to be taken to mitigate the damage or defect.
- Notice within 48-hours of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, including a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of all approved work plans and reports, including this SMP.

- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing.

2.5 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to Michael Mason of the NYSDEC. These emergency contact lists must be maintained in an easily accessible location at the site.

Emergency Contact Numbers	
Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Contact Numbers	
Michael Mason, NYSDEC	518-402-9814
NOTE: Contact numbers subject to change and should be updated as necessary	

2.5.2 Map and Directions to Nearest Health Facility

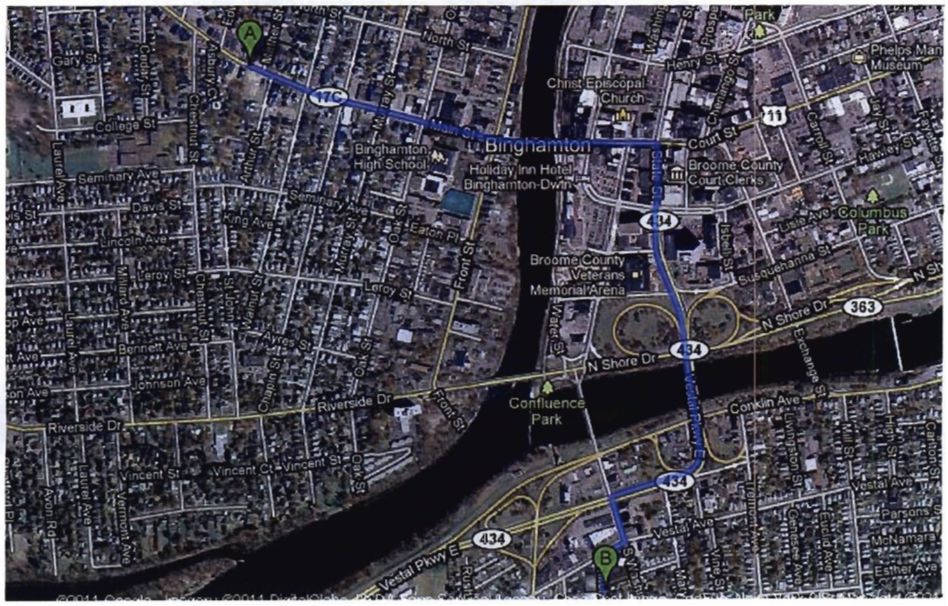
Site Location: 93 Main Street
Nearest Hospital Name: UHS Binghamton General Hospital
Hospital Location: 42 Mitchell Avenue, Binghamton, New York 13903
Hospital Telephone: 607-762-2176

Directions to the Hospital:

1. Head southeast on Main St. toward Mather St.
2. Continue onto Court St.
3. Turn right at State St.
4. Continue onto Vestal Pkwy E.
5. Turn left at S Washington St.
6. Take 1st right onto Vestal Ave
7. Take 1st left onto Mitchell Ave

Total Distance: 1.5 miles
Total Estimated Time: 5 minutes

Map Showing Route from the site to the Hospital:



*Map is from maps.google.com

2.5.3 Response Procedures

As appropriate, the fire department and other emergency response group will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan. The list will also be posted prominently at the site and made readily available to all personnel at all times.

2.5.3.1 Spill Procedures

In the event that a hazardous substance is released on the site, all site personnel shall be notified immediately. If the substance poses an immediate threat to human health and the environment, evacuation and notification of the appropriate authorities including the NYSDEC Spill Response team (listed in previous table) may be necessary. If the release is minimal and does not pose a health risk, the leak shall be contained and the spilled material shall be cleaned up with appropriately sized absorbent pads. Materials used to contain the substance shall be disposed of properly.

2.5.3.2 Evacuation Plan

If site evacuation is necessary, site personnel shall exit the site on Main Street. All site personnel shall be notified of the evacuation.

3.0 SITE MONITORING PLAN

3.1 INTRODUCTION

3.1.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site, the soil cover system, and all affected site media identified below. Monitoring of other ECs is described in Section 4, Operation, Monitoring, and Maintenance Plan. This Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils)
- Assessing compliance with applicable NYSDEC standards, criteria, and guidance, particularly ambient groundwater standards and Part 375 SCOs for soil
- Assessing achievement of the remedial performance criteria.
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency
- Information on all designed monitoring systems (e.g., well logs)
- Analytical sampling program requirements
- Reporting requirements
- Quality Assurance (QA)/Quality Control (QC) requirements
- Inspection and maintenance requirements for monitoring wells

- Monitoring well decommissioning procedures
- Annual inspection and periodic certification.

Quarterly monitoring of the performance of the remedy and overall reduction in contamination onsite will be conducted for the first year. The frequency thereafter will be determined by NYSDEC. Trends in contaminant levels in air, soil, and/or groundwater in the affected areas, will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in the table below and outlined in detail in Sections 3.2 and 3.3.

Monitoring/Inspection Schedule			
Monitoring Program	**Frequency[a]**	**Matrix**	**Analysis**
Groundwater	Quarterly (for first year)	Water	Pesticides and Herbicides
Site Inspection	Quarterly (for first year)	NA	NA
(a) The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH			

3.2 COVER SYSTEM MONITORING

For the first year of monitoring, the cover system will be inspected on a quarterly basis and after large storm events to ensure proper drainage and to look for erosion and sedimentation issues. The inspector will also note whether the cover has been disturbed. There is no vegetative cover in the excavation area, but grass planted along the adjacent property boundary shall be inspected to make sure it is growing in fully.

3.3 MEDIA MONITORING PROGRAM

Groundwater is the only media that will be monitored at this site.

3.3.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy and to document the attenuation of residual groundwater contamination.

The network of monitoring wells has been installed to monitor both upgradient and downgradient groundwater conditions at the site. The network of onsite and offsite wells was designed during the two RI phases and the pre-design investigation phase of the project. Six monitoring wells were installed during Phase I of the RI based on site topography. During Phase II, four more wells were installed based on site topography and information gathered during Phase I gauging and sampling events. During the pre-design investigation two additional wells were installed near the former floor drain location. Of the wells installed at the site, one was dry and two were within the

excavation area. These were decommissioned during the remedial construction. The nine remaining wells will be sampled during groundwater monitoring events. A figure showing the monitoring well array is included as Figure 2. Monitoring well construction logs are included in Appendix C.

Each monitoring wells are to be sampled quarterly for the first year, and annually thereafter, for a total of 30 years unless modified by NYSDEC. Wells will be sampled for pesticides by United States Environmental Protection Agency (USEPA) method 8081A and herbicides by USEPA method 8151A.

The sampling frequency may be modified with the approval of NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC. Deliverables for the groundwater monitoring program are specified below.

3.3.1.1 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log presented in Appendix D. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

Prior to sampling, all monitoring wells shall be inspected and gauged to obtain the static water levels for the site. Monitoring well purging will be performed and groundwater samples will be collected from the monitoring wells using a submersible pump and dedicated section of polyethylene tubing. A water quality meter (Horiba U-52 or similar) with flow-through cell (flushed with distilled water before use at each well) will be used during well purging for field measurement of pH, specific conductance, temperature, Eh, turbidity, and dissolved oxygen. Each well shall be purged three well volumes or until field parameters stabilize, whichever occurs first.

The following procedures will be used for monitoring well groundwater sampling:

- Wear appropriate personal protective equipment as specified in the site-specific HASP Addendum. In addition, samplers will use new nitrile sampling gloves for the collection of each sample.
- Unlock and remove the well cap.
- Measure the static water level in the well with an electronic water level indicator.

The water level indicator will be washed with Alconox detergent and water, then rinsed with deionized water between individual monitoring wells to prevent cross-contamination.

- Calculate the volume of water in the well.

- Place polyethylene sheeting around the well casing to prevent contamination of sampling equipment in the event sampling equipment is dropped.

- Purge 3-5 well volumes of water from the well or until water quality parameters are stabilized, using the method described below.
  - Pump with a submersible pump equipped with new polyethylene tubing dedicated to each well. Set pump intake at the approximate mid-point of the monitoring wells screened interval and start pump.

- Allow field parameters of pH, reduction-oxidation potential (Eh), dissolved oxygen, specific conductivity, turbidity, and temperature to stabilize before sampling. Purging will be considered complete if the following conditions are met:
  - Consecutive pH readings are ±0.1 pH units of each other
  - Consecutive dissolved oxygen readings are ±10 percent of each other
  - Consecutive Redox readings are ±0.10 units of each other
  - Consecutive measured specific conductance is ±3 percent of each other
  - Turbidity < 50 Nephelometric turbidity units

If these parameters are not met after purging a volume equal to 3-5 times the volume of standing water in the well, the EA Project Manager will be contacted to determine the appropriate action(s).

- If the well is purged dry before the required volumes are removed, the well may be sampled when it recovers (recovery period up to 24 hours).

- Place analytical samples in cooler and chill to 4°C. Samples will be shipped to the analytical laboratories within 24 hours.

- Pump will be decontaminated and the polyethylene suction/discharge line will be properly discarded.

- Re-lock well cap.

- Fill out field sampling form, labels, custody seals, and chain-of-custody forms.

Groundwater samples will be placed in appropriate sample containers, sealed, and submitted to the laboratory for analysis.

3.3.1.2 Monitoring Well Repairs, Replacement, and Decommissioning

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced if an event renders the wells unusable. Well decommissioning procedures are as follows:

- Measure total depth of the well to ensure the well depth is consistent with the recorded construction depth
- Remove the steel manhole or steel stickup protective casing with an effort being made to ensure that the riser does not splinter and/or become structurally unstable for pulling
- The bottom of the casing shall be punctured and the casing freed from the hole using suitable equipment (i.e., drill rig cable system).
- The well shall be tremie-grouted with a cement bentonite grout while removing the casing. The grout shall be completed to a depth of approximately 5 ft below grade.
- A bentonite seal shall be placed on top of the grout.
- The remaining riser shall be sealed with a Portland cement plug to the ground surface.

In the event the casing or well screen is severed during casing pulling, or if a borehole collapse occurs, the remaining materials will be removed by overdrilling using the conventional augering method described below:

- Overdrilling shall be conducted by either using a hollow-stem auger with outward facing carbide cutting teeth with a diameter 2 inches larger than the casing and/or using a hollow-stem auger fitting with a plug used to grind the well materials which will be brought to the surface by the auger.
- Overdrilling shall be advanced 0.5 ft beyond the original bore depth.
- Once the desired drilling depth has been completed (using open ended hollow-stem auger method) the casing and screen shall be retrieved from the center of the augers.
- As the augers are being retracted, cement-bentonite grout shall be pumped down the center of the augers.

- Bore hole shall be grouted and sealed with bentonite and Portland cement as described above.

Replacement wells shall be constructed using methods consistent with those used during the RI. Monitoring well construction logs are provided in Appendix C.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's Groundwater Monitoring Well Decommissioning Procedures. Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.4 SITE-WIDE INSPECTION

Site-wide inspections will be performed on a regular schedule at a minimum of once a year. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed (Appendix D). The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage
- An evaluation of the condition and continued effectiveness of ECs
- General site conditions at the time of the inspection
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection
- Compliance with permits and schedules included in the Operation and Maintenance Plan
- Confirm that site records are up to date.

3.5 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

All sampling and analyses will be performed in accordance with the requirements of the Quality Assurance Project Plan (QAPP) prepared for the site (Appendix E). Main components of the QAPP include:

- QA/QC objectives for data measurement
- Sampling Program:
  - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
  - Sample holding times will be in accordance with the NYSDEC ASP requirements.
  - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody
- Calibration Procedures:
  - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
  - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and checks
- Preventative maintenance procedures and schedules

3.6 MONITORING REPORTING REQUIREMENTS

Forms and any other information generated during regular monitoring events and inspections will be kept on file onsite. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP.

All monitoring results will be reported to NYSDEC on a periodic basis in the Periodic Review Report. A letter report will also be prepared subsequent to each sampling event. The letter will include, at a minimum:

- Date of event
- Personnel conducting sampling
- Description of the activities performed
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc)
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.)
- Sampling results in comparison to appropriate standards/criteria
- A figure illustrating sample type and sampling locations
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format)
- Any observations, conclusions, or recommendations
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC.

A summary of the monitoring program deliverables are summarized in the table below.

Schedule of Monitoring/Inspection Reports	
Task	**Reporting Frequency[a]**
Letter Inspection and Monitoring Report	Quarterly for the first year only
Periodic Review Report	Annually
(a) The frequency of events will be conducted as specified until otherwise approved by NYSDEC	

4.0 OPERATION AND MAINTENANCE PLAN

4.1 INTRODUCTION

The site remedy does not rely on any mechanical systems, such as sub-slab depressurization systems or air sparge/soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

5.0 INSPECTIONS, REPORTING, AND CERTIFICATIONS

5.1 SITE INSPECTIONS

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3 Monitoring Plan of this SMP. At a minimum, a site-wide inspection will be conducted annually. Inspections of remedial components (if applicable) will also be conducted when a breakdown of any treatment system component has occurred or whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

All monitoring events will be recorded on the appropriate form. Additionally, a general site-wide inspection form will be completed during the site-wide inspection. All field forms are provided in Appendix D. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format in the Periodic Review Report.

5.1.3 Evaluation of Records and Reporting

The results of the inspection and site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective
- The Monitoring Plan is being implemented
- Operation and maintenance activities are being conducted properly
- The site remedy continues to be protective of public health and the environment and is performing as designed in the Remedial Action Work Plan and Final Engineering Report.

5.2 CERTIFICATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

After the last inspection of the reporting period, a qualified environmental professional will prepare the following certification:

For each IC/EC identified for the site, I certify that all of the following statements are true:

- The inspection of the site to confirm the effectiveness of the EC/ICs required by the remedial program was performed under my direction
- The IC and/or EC employed at this site is unchanged from the date the control was put in place, or last approved by the Department
- Nothing has occurred that would impair the ability of the control to protect the public health and environment
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document
- Use of the site is compliant with the environmental easement
- The engineering control systems are performing as designed and are effective
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative]

The signed certification will be included in the Periodic Review Report described below.

5.3 PERIODIC REVIEW REPORT

A Periodic Review Report will be submitted to the Department every year, beginning eighteen months after the Certificate of Completion is issued. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. Media sampling results will also incorporated into the Periodic Review Report. The report will include:

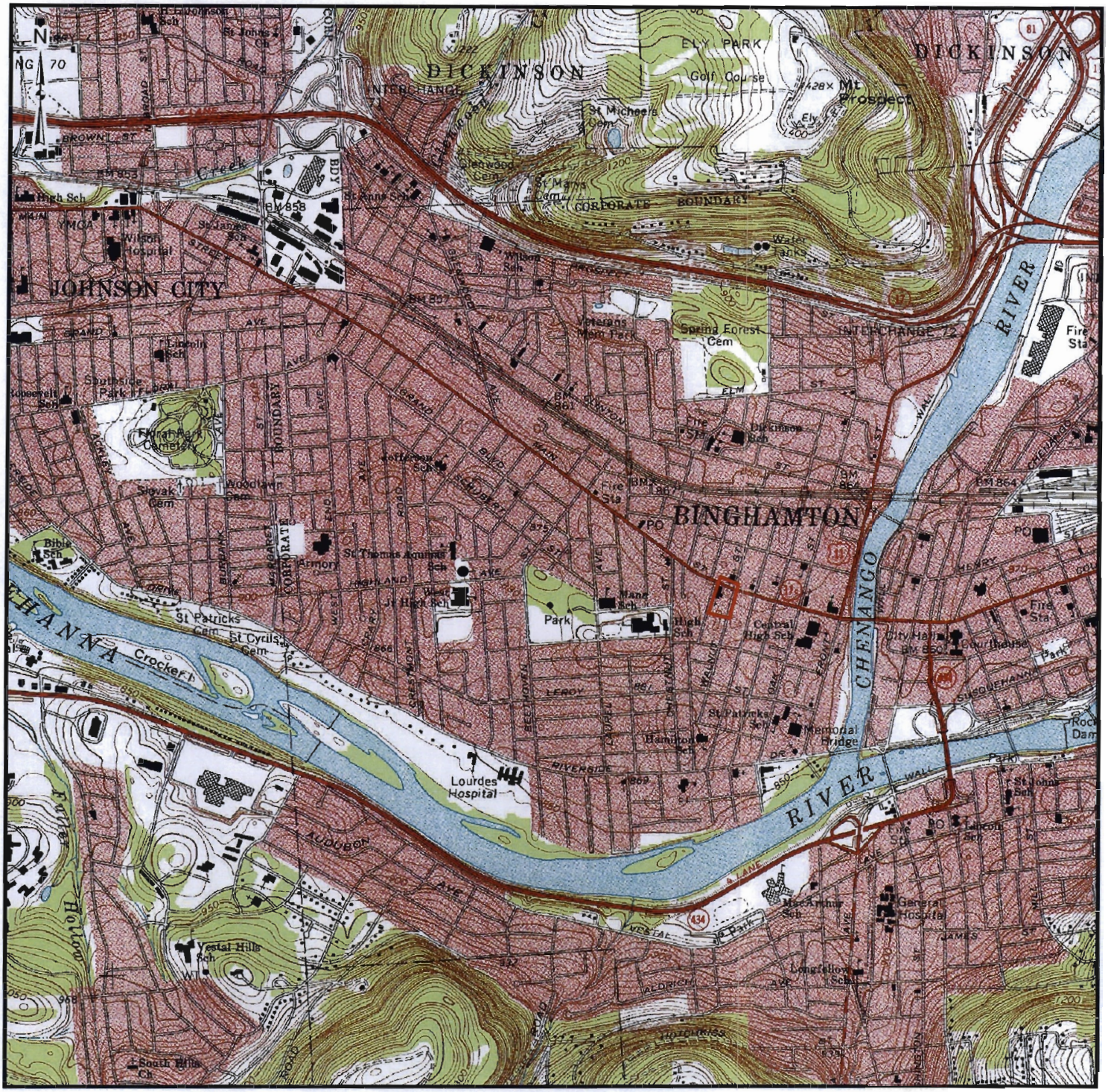
- Identification, assessment, and certification of all ECs/ICs required by the remedy for the site
- Results of the required annual site inspections and severe condition inspections, if applicable
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedences highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format.
- A site evaluation, which includes the following:
    - The compliance of the remedy with the requirements of the site-specific Remedial Action Work Plan, ROD, or Decision Document
    - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications
    - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored
    - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan
    - The overall performance and effectiveness of the remedy.

The Periodic Review Report will be submitted, in electronic format to NYSDEC Central Office, Regional Office, and the NYSDOH Bureau of Environmental Exposure Investigation. The following naming format will be used:

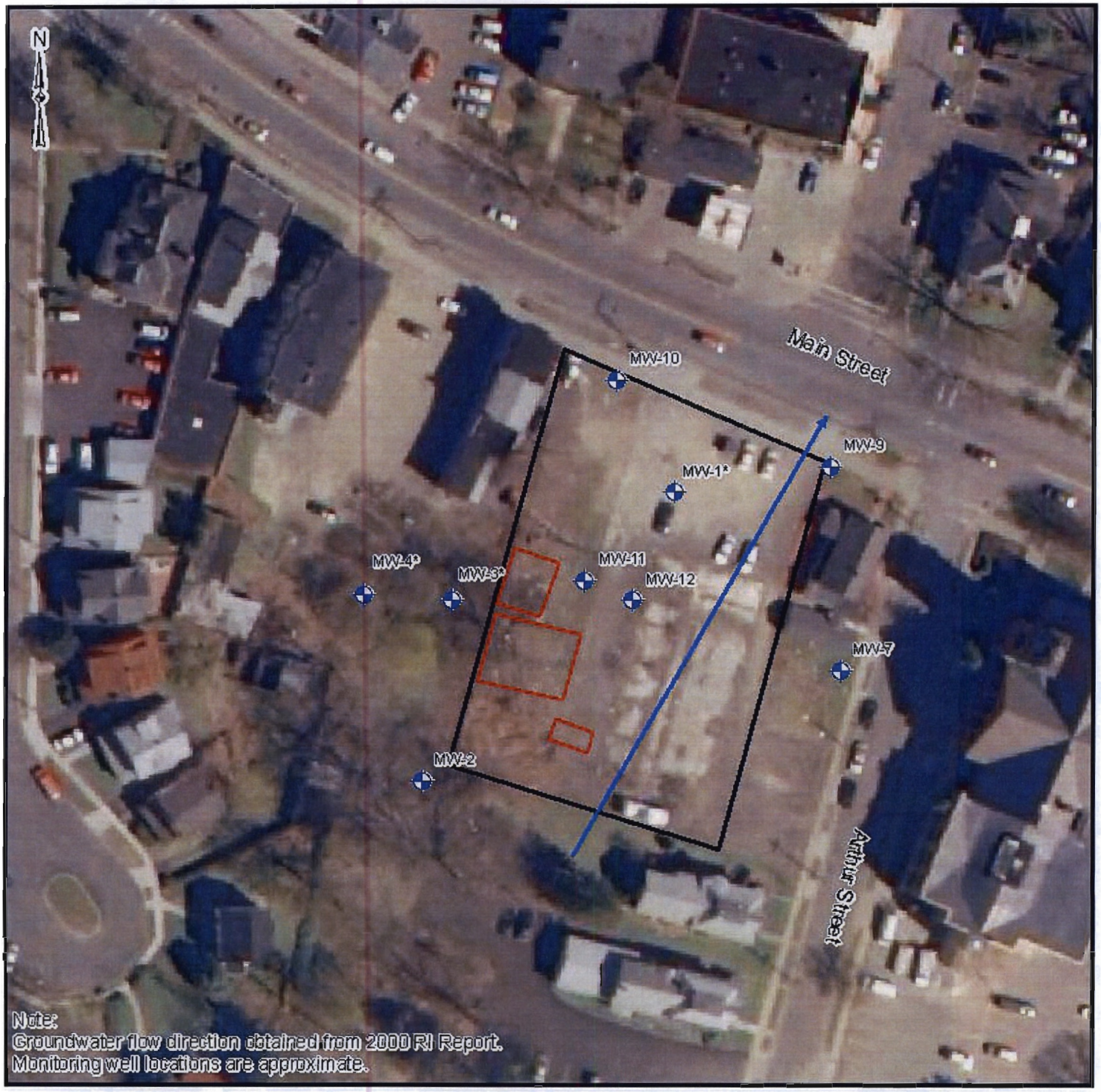
Report.hw704027.year(xxxx).month(xx).date(xx).93MainSt.PRR.pdf

5.4 CORRECTIVE MEASURES PLAN

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an IC/EC, a corrective measures plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.



93 MAIN STREET SITE MANAGEMENT PLAN BINGHAMTON, NEW YORK						FIGURE 1 SITE LOCATION MAP	
PROJECT MGR: JAG	DESIGNED BY: JAG	CREATED BY: MEM	CHECKED BY: JAG	SCALE: AS SHOWN	DATE: JUNE 2011	PROJECT NO: 14474.32	FILE NO: GIS/PROJECTS/ FIGURE1.MXD



Legend

- Monitoring Well
- Excavation Area
- Property Boundary
- Groundwater Flow Direction
- * Indicates approximate monitoring well location

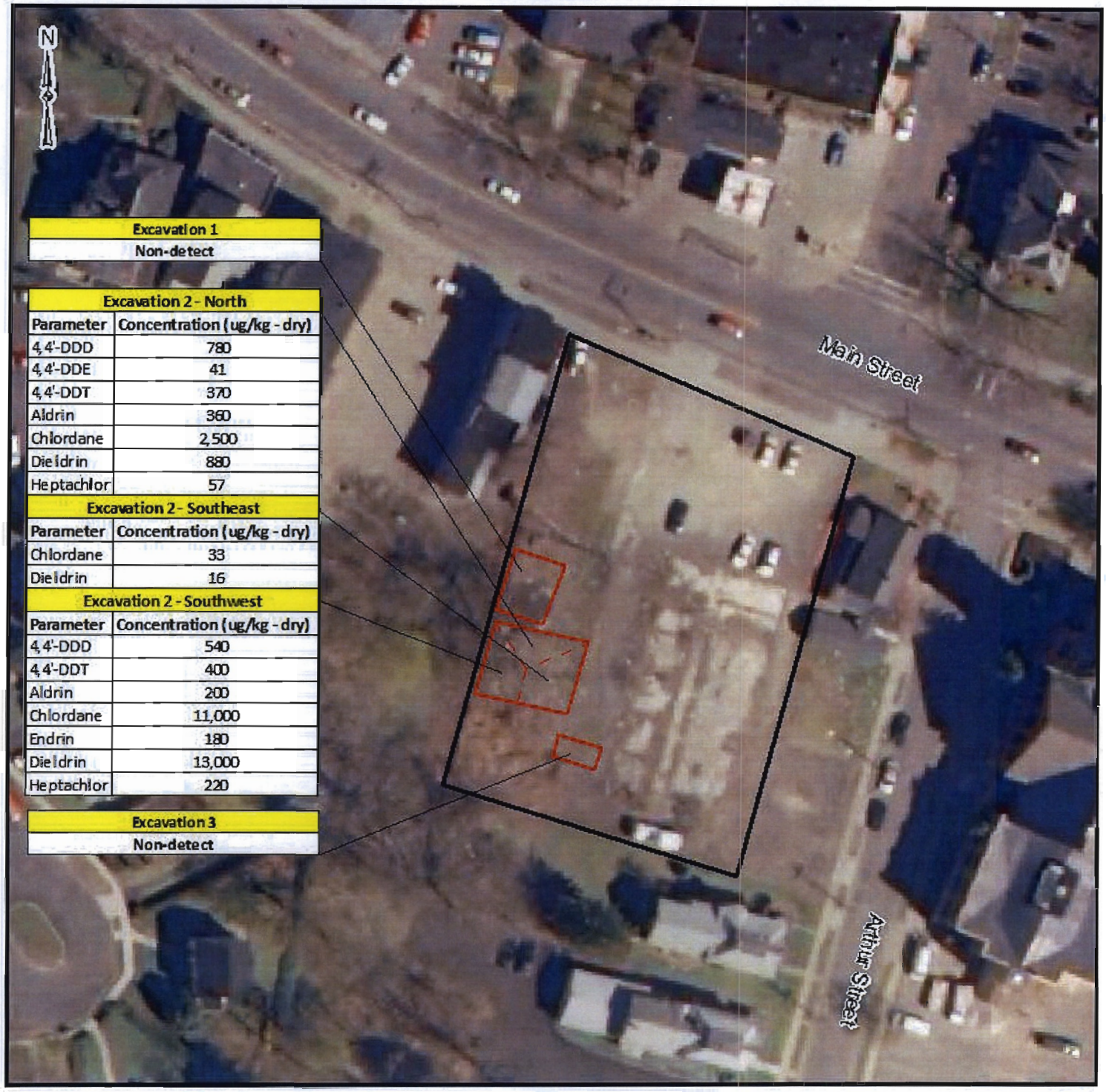
Feet: 0 25 50 100 150

Source: NY GIS, USDA Farm Service Agency

93 MAIN STREET
SITE MANAGEMENT PLAN
BINGHAMTON, NEW YORK

FIGURE 2
GROUNDWATER FLOW AND
MONITORING WELL ARRAY

PROJECT MGR:	DESIGNED BY:	CREATED BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:	FILE NO:
JAG	SAB	SAB	JAG	AS SHOWN	JUNE 2011	14474.32	GIS/PROJECTS/FIGURE 2.MXD



Excavation 1
Non-detect

Excavation 2 - North	
Parameter	Concentration (ug/kg - dry)
4,4'-DDD	780
4,4'-DDE	41
4,4'-DDT	370
Aldrin	360
Chlordane	2,500
Dieldrin	880
Heptachlor	57

Excavation 2 - Southeast	
Parameter	Concentration (ug/kg - dry)
Chlordane	33
Dieldrin	16

Excavation 2 - Southwest	
Parameter	Concentration (ug/kg - dry)
4,4'-DDD	540
4,4'-DDT	400
Aldrin	200
Chlordane	11,000
Endrin	180
Dieldrin	13,000
Heptachlor	220

Excavation 3
Non-detect

Legend

Excavation Area

Property Boundary

0 25 50 100 150 Feet

Source: NY GIS, USDA Farm Service Agency

NOTE: SCOs are NYSDEC Part 375 Restricted Residential Values.

98 MAIN STREET SITE MANAGEMENT PLAN BINGHAMTON, NEW YORK						FIGURE 3 ENDPOINT SAMPLING RESULTS EXCEEDING SCOs	
PROJECT MGR: JAG	DESIGNED BY: SAB	CREATED BY: SAB	CHECKED BY: JAG	SCALE: AS SHOWN	DATE: JUNE 2011	PROJECT NO: 14474.32	FILE NO: GIS/PROJECTS/ FIGURE 2.MXD

TABLE 1 SOIL REMEDIAL ACTION OBJECTIVES

Contaminant	NYCRR Part 375 Table 375-6.8(a) Unrestricted Use Soil Cleanup Objectives (ppm)	NYCRR Part 375 Table 375-6.8(b) Restricted-Residential Use Soil Cleanup Objectives (ppm)
PESTICIDES		
2,4,5-TP Acid (Silvex)	4	100
4,4'-DDE	0.0033	8.9
4,4'-DDT	0.0033	7.9
4,4'-DDD	0.0033	13
Aldrin	0.005	0.097
alpha-BHC	0.02	0.48
beta-BHC	0.036	0.36
Chlordane (alpha)	0.094	4.2
delta-BHC	0.04	100
Dibenzofuran	7	59
Dieldrin	0.005	0.2
Endosulfan I	2.4	24
Endosulfan II	2.4	24
Endosulfan sulfate	2.4	24
Endrin	0.014	11
Heptachlor	0.042	2.1
Lindane	0.1	1.3

NOTE: ppm = Parts per million
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane
DDD = Dichlorodiphenyldichloroethane
There are no soil cleanup objectives for herbicides.

TABLE 2 DETECTED PESTICIDES ENPOINT ANALYTICAL DATA

Parameter List USEPA Method 8081A	Sample ID	704027-S-E2-EP-N		704027-S-E2-EP-SE		704027-S-EP-SW		704027-S-E1-EP-N		704027-S-E1-EP-S		704027-S-E3-EP		FIELD DUPLICATE		6NYCRR Part 375 Restricted Residential Use (ppm)	6NYCRR Part 375 Unrestricted Residential Use (ppm)
	Lab ID	U1010356-001		U1010356-002		U101356-003		U1011186-001		U1011186-002		U1011296-001		U1010356-004			
	Sample Type	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL			
	Sample Date	10/18/2010		10/18/2010		10/18/2010		11/3/2010		11/3/2010		11/10/2010		10/18/2010			
4,4'-DDD	µg/Kg-dry	***780***		(<3.7)	U	***540***		(<3.5)	U	(<3.6)	U	(<3.7)	U	(<3 6)	U	13	0.0033
4,4'-DDE	µg/Kg-dry	***41***		(<3.7)	U	(<200)	U	(<3.5)	U	(<3 6)	U	(<3 7)	U	(<3 6)	U	8 9	0 0033
4,4'-DDT	µg/Kg-dry	***370***		(<3.7)	U	***400***		(<3 5)	U	(<3.6)	U	(<3.7)	U	(<3.6)	U	7 9	0 0033
Aldrin	µg/Kg-dry	***360***		(<1 9)	U	***200***		(<1 8)	U	(<1.9)	U	(<1.9)	U	(<1.9)	U	0.097	0 005
alpha-BHC	µg/Kg-dry	(<2.0)	U	(<1 9)	U	(<2.1)	U	(<1.8)	U	(<1.9)	U	(<1.9)	U	(<1.9)	U	0.48	0.02
alpha-Chlordane	µg/Kg-dry	*390*		*3.2*		*1,600*		(<1.8)	U	(<1 9)	U	(<1 9)	U	(<1 9)	U	4 2	0 094
beta-BHC	µg/Kg-dry	(<2 0)	U	(<1 9)	U	(<2 1)	U	(<1 8)	U	(<1 9)	U	(<1 9)	U	(<1 9)	U	0.36	0 036
Chlordane	µg/Kg-dry	**2,500**		**33**		**11,000**		(<1.8)	U	(<1.9)	U	(<1 9)	U	**10**		—	---
delta-BHC	µg/Kg-dry	(<2 0)	U	(<1 9)	U	(<2.1)	U	(<1.8)	U	(<1 9)	U	(<1.9)	U	(<1 9)	U	100	0 04
Dieldrin	µg/Kg-dry	***880***		***16***		***13,000***		(<3 5)	U	(<3.6)	U	(<3 7)	U	(<3 6)	U	0 2	0 005
Endosulfan I	µg/Kg-dry	(<3 9)	U	(<1 9)	U	(<2 1)	U	(<1.8)	U	(<1.9)	U	(<1 9)	U	(<1 9)	U	24	2 4
Endosulfan II	µg/Kg-dry	(<3 9)	U	(<3.7)	U	(<4.0)	U	(<3.5)	U	(<3.6)	U	(<3.7)	U	(<3.6)	U	24	2.4
Endosulfan sulfate	µg/Kg-dry	(<3.9)	U	(<3 7)	U	(<4.0)	U	(<3.5)	U	(<3 6)	U	(<3.7)	U	(<3.6)	U	24	2.4
Endrin	µg/Kg-dry	(<3 9)	U	(<3 7)	U	***180***		(<3.5)	U	(<3 6)	U	(<3 7)	U	(<3.6)	U	11	0 014
Endrin aldehyde	µg/Kg-dry	(<3.9)	U	(<3 7)	U	(<4 0)	U	(<3 5)	U	(<3 6)	U	(<3 7)	U	(<3 6)	U	—	---
Endrin ketone	µg/Kg-dry	14		(<3 7)	U	41		(<3 5)	U	(<3.6)	U	(<3.7)	U	(<3.6)	U	—	---
gamma-BHC	µg/Kg-dry	120		(<1 9)	U	27		(<1 8)	U	(<1.9)	U	(<1 9)	U	(<1 9)	U	—	---
gamma-Chlordane	µg/Kg-dry	350		3 2		1,700		(<1 8)	U	(<1 9)	U	(<1 9)	U	(<1 9)	U	—	---
Heptachlor	µg/Kg-dry	***57***		(<1 9)	U	***220***		(<1 8)	U	(<1 9)	U	(<1 9)	U	(<1 9)	U	2.1	0 042
Heptachlor epoxide	µg/Kg-dry	(<2.0)	U	(<1.9)	U	(<2 1)	U	(<1.8)	U	(<1 9)	U	(<1.9)	U	(<1.9)	U	---	---
Methoxychlor	µg/Kg-dry	(<20.0)	U	(<19.0)	U	(<21)	U	(<18)	U	(<19)	U	(<19)	U	(<19.0)	U	---	---
Toxaphene	µg/Kg-dry	(<200 0)	U	(<190 0)	U	(<210)	U	(<180)	U	(<190)	U	(<190)	U	(<190.0)	U	---	---

NOTE USEPA = United States Environmental Protection Agency
NYCRR = New York Codes of Rules and Regulations
ppm = Parts per million
DDD = Dichlorodiphenyldichloroethane
µg/Kg = Micrograms per kilogram
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane
--- = No guidance value
Analytical data results provided by Upstate Laboratories, Inc
Concentrations in **BOLD** indicate that the analyte was detected above the NYCRR Part 375 Soil Cleanup Objective - Restricted Residential Use
Concentrations in *ITALICS* indicate that the analyte was detected above the NYCRR Part 375 Soil Cleanup Objective - Unrestricted Residential Use

Appendix A

Excavation Work Plan

APPENDIX A – EXCAVATION WORK PLAN

A-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

Mike Mason
Site Remediation Engineer
625 Broadway 12th Floor
Albany, New York 12233-0001

This notification will include:

- A detailed description of the work to be performed including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated, and any work that may impact an engineering control.
- A summary of environmental conditions anticipated in the work areas including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling.
- A schedule for the work detailing the start and completion of all intrusive work.
- A summary of the applicable components of this Excavation Work Plan (EWP).
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120.
- A copy of the contractor's Health and Safety Plan (HASP), in electronic format, if it differs from the HASP provided in Appendix B of this document.
- Identification of disposal facilities for potential waste streams.
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

A-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be

performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the Certificate of Completion. Concurrent with the excavation, a log of observations will be maintained for the purpose of establishing a record of the general character of the materials encountered. The log will include the date, location, depth, depth to groundwater, nature of material (i.e., sand, silt, waste), and unusual features.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

A-3 STOCKPILE METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters, and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum of once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by New York State Department of Environmental Conservation (NYSDEC).

A-4 MATERIALS EXCAVATION AND LOAD OUT

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan. All existing utilities shall be located prior to excavation. To protect nearby structures, roads, and walkways, proposed site excavations shall be evaluated by a certified engineer to determine the need for sheeting or shoring.

Excavations shall be performed in a manner that will limit spills and the potential for contaminated material to be mixed with uncontaminated material. A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this Site Management Plan (SMP) is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and New

York State Department of Transportation requirements (and all other applicable transportation requirements).

A truck wash will be operated onsite. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

A-5 MATERIALS TRANSPORT OFFSITE

The Contractor shall provide all required notifications to federal, state and local agencies prior to transporting material off site. All transport of materials will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations, including 6 New York Code of Rules and Regulations (NYCRR) Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Truck transport routes are as follows:

1. Turn left onto Main Street.
2. Drive 4.3 miles and merge onto I-86 West/NY-17 W/Southern Tier Expressway via the ramp on the left.

Map courtesy of www.google.com

All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.
Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

A-6 MATERIALS DISPOSAL OFFSITE

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, state (including 6 NYCRR Part 360), and federal regulations. If disposal of soil/fill from this site is proposed for unregulated off-site disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill,

petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6 NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted Soil Cleanup Objectives is prohibited from being taken to a New York State recycling facility (6 NYCRR Part 360-16 Registration Facility).

A-7 MATERIALS REUSE ON-SITE

Soils for on-site reuse shall be sampled at a frequency of one per 500 yd^3 for metals by United States Environmental Protection Agency (USEPA) Method 6010, polychlorinated biphenyls (PCBs) and pesticides by USEPA Method 8081/8082, semivolatile organic compounds (SVOCs) by USEPA Method 8270, and volatile organic compounds (VOCs) by USEPA Method 8260. Chemical criteria for on-site reuse of material have been approved by NYSDEC and are listed in Table 1. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain onsite. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use onsite will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Soils stockpiled for reuse shall not come into contact with contaminated site soils. The stockpile pad shall include a 40 mil high-density polyethylene liner (or approved similar) and cover for dust control. Materials used for stockpile pad construction shall be disposed of properly.

Any demolition material proposed for reuse onsite will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing onsite will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused onsite.

A-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, state, and federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed offsite.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a State Pollutant Discharge Elimination System permit.

A-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities, the cover system will be restored in a manner that complies with the Remedial Action Work Plan. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in any updates to the SMP.

A-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. Prior to delivery of soil to the site from an off-site source, the source of supply shall be approved by the NYSDEC. The facility shall be operating under a valid NYSDEC Mining Permit or other applicable regulatory authority for the duration of the site work.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All materials shall be sampled for target compound list (TCL) VOCs by USEPA Method 8260, TCL SVOCs by USEPA Method 8270, TCL pesticides/PCBs by USEPA Method 8081/8082, and target analyte list (TAL) metals by USEPA Method 6010 at a frequency of one per source. All imported soils will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, the resulting soil quality standards are listed in Table 1 of the SMP. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

A-11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the

site and available for inspection by NYSDEC. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

A-12 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (i.e., TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be included in the periodic reports prepared pursuant to Section 5 of the SMP.

A-13 COMMUNITY AIR MONITORING PLAN

Community air monitoring will be implemented to monitor for VOC and particulate levels at the perimeter of the work area. Total VOCs will be monitored continuously at the downwind perimeter of the work area daily using approved instrumentation. If total VOC levels exceed 5 parts per million (ppm) above background at the work area perimeter, work activities will be halted and monitoring continued. All readings will be recorded and available to the NYSDEC and New York State Department of Health (NYSDOH) personnel to review.

Because the site is in a densely populated area, with residential and commercial buildings adjacent to the site, a fixed monitoring station shall be located at the site perimeter, regardless of wind direction.

Exceedances of action levels listed in the Community Air Monitoring Plan will be reported to NYSDEC and NYSDOH Project Managers.

A-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used as necessary will include odor masking agents. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

A-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.

- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.

- Gravel will be used on roadways to provide a clean and dust-free road surface.

- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

A-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work. A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

Appendix B

Health and Safety Plan

Horizon Environmental Services
Site Specific Health and Safety Plan
93 Main Street Site
Binghamton, New York

Prepared By:

Brian Spangler

Horizon Environmental Services

Reviewed and Approved By:

James M. Trainer, CIH

HSE Consulting Services

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1.0 ORGANIZATIONAL STRUCTURE

This Section of the Health and Safety Plan (HASP) describes lines of authority, responsibility, and communication for health and safety functions at this site. The purpose of this Section is to identify the personnel involved in the development and implementation of the site health and safety plan and to describe their roles and responsibilities. This Section also identifies other contractors and subcontractors involved in work operations. It establishes the lines of communication among them for safety and health matters.

1.1 Roles and Responsibilities

All personnel and visitors on this site must comply with the requirements of this HASP. The specific responsibilities and authority of management, safety and health, and other personnel on this site are detailed in the following paragraphs. A site organizational chart illustrating the hierarchy of personnel and lines of communication within Horizon Environmental Services and with additional contractors on site is found in Figure 1-1.

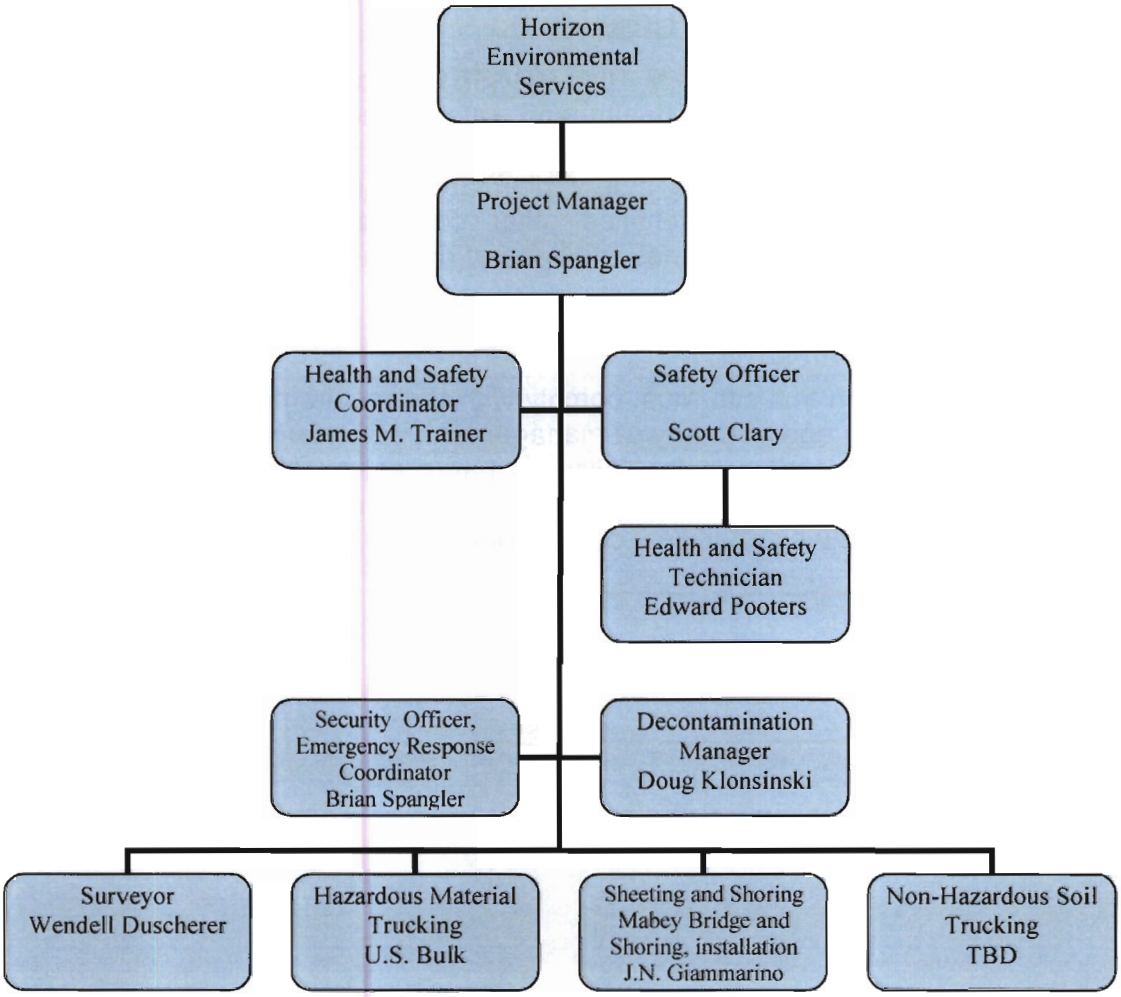


Figure 1-1: Site Organizational Chart

Health and Safety Coordinator (HSC)

The Health and Safety Coordinator (HSC) for this project is James M. Trainer.

Mr. Trainer is an American Board of Industrial Hygiene Certified Industrial Hygienist and has responsibility for the overall development and implementation of the HASP. The HSC will be available for consultation by the Safety Officer and will be available to assist the Safety Officer in follow-up training and if changes in the site conditions occur.

Project Manager (PM)

The Project Manager (PM) for this site is Brian Spangler.

Mr. Spangler has the responsibility and authority to direct all work operations. The PM coordinates safety and health functions with the site Safety Officer (SO), has the authority to oversee and monitor the performance of the SO, and bears ultimate responsibility for the proper implementation of this HASP. The specific duties of the PM are:

- Preparing and coordinating the site work plan;
- Providing work assignments and overseeing their performance;
- Coordinating safety and health efforts with the SO;
- Ensuring effective emergency response through coordination with the Emergency Response Coordinator (ERC);
- Serving as primary site liaison with public agencies and officials and site contractors.

The qualified alternate Project Manager (PM) for this site is Scott Clary.

Site Safety and Health Officer (SO)

The site Safety and Health Officer (SO) for this site is Scott Clary.

Mr. Clary has full responsibility for the implementation and adherence to this HASP and the authority to verify compliance. The SO is on site or readily accessible to the site during all work operations and has the authority to halt site work if unsafe conditions are detected. The specific responsibilities of the SO are:

Managing the safety and health functions on this site; serving as the site's point of contact for safety and health matters; ensuring site monitoring, worker training, medical surveillance, and effective selection and use of PPE; assessing site conditions for unsafe acts and conditions and providing corrective action; assisting in the preparation and review of this HASP; alerting NYDEC prior to starting any hazardous work; informing and providing hazard communication information to project personnel; maintaining the separation of the Exclusion Zone from the Support Zone; coordinating with the Emergency Response Coordinator (ERC), and others as necessary for safety and health efforts.

The qualified alternate Site Safety and Health Officer (SO) for this site is Brian Spangler.

Mr. Clary and Mr. Spangler are CPR and First Aid certified. Mr. Clary and Mr. Spangler also have at least two years experience in hazardous waste remediation.

Emergency Response Coordinator (ERC)

The Emergency Response Coordinator (ERC) for this site is Brian Spangler.

The ERC is responsible for assessing site conditions and directing and controlling emergency response activities and personnel in accordance with the Site Emergency Response Plan. The ERC reports to the Project Manager (PM). The ERC will ensure the evacuation, emergency transport, and treatment of site personnel and will notify the appropriate emergency response units and management staff in accordance with the emergency response plan of this HASP. Specific duties of the ERC include:

- Developing and reviewing the emergency response plan;
- Conducting emergency response rehearsals;
- Ensuring effective emergency response to and evacuation of the site;
- Coordinating emergency response functions with the Site Safety and Health Officer (SO),
- Integrating site emergency response plans with the disaster, fire, and/or emergency response plans of local, state, and federal organizations and agencies.

The qualified alternate Emergency Response Coordinator (ERC) for this site is James M. Trainer

Health and Safety Technician (HST)

The Health and Safety Technician for this site is Edward Pooters.

The HST reports to the site Safety Officer (SO). The Health and Safety Technician ensures the implementation of the HASP requirements and procedures in the field. The specific responsibilities of the Health and Safety Technician are:

- Assisting the SO with the operation and calibration of air monitoring equipment
- Coordination with the SO on safety and health;
- Ensuring on-site compliance with the requirements of this HASP.

Mr. Pooters is CPR and First Aid certified. Mr. Pooters also have at least two years experience in hazardous waste remediation.

Site Workers

Site workers are responsible for complying with this HASP, using the proper PPE, reporting unsafe acts and conditions, and following the lines of authority established for this project site.

Decontamination Manager

The Decontamination Manager for this site is Doug Klonsinski.

The Decontamination Manager is responsible for decontamination procedures, equipment, and supplies. The specific responsibilities of the Decontamination Manager are:

Setting up decontamination lines for trucks, personnel and equipment; controlling the decontamination of all equipment and personnel from the contaminated areas; assisting in disposal of contaminated clothing and materials; ensuring all required equipment is available and in working order; and providing for collection, storage and disposal of waste.

The qualified alternate Decontamination Manager for this site is Brian Spangler.

Security Officer

The Security Officer for this site is Brian Spangler. The Security Officer is responsible for managing and maintaining site security. The specific responsibilities of the Security Officer are:

Conducting routine area patrols; controlling site access and egress; assisting with communication during an emergency; securing accident/incident scenes; maintaining a log of site access and egress; supervising and monitoring the performance of the after hours security inspections and fencing integrity.

2.0 SITE CHARACTERIZATION AND JOB HAZARD ANALYSIS

The person responsible for ongoing site characterization and job hazard analysis at this site is James M. Trainer.

2.1 Site History

The 93 Main Street Site, located in the City of Binghamton, Broome County, New York is a New York State Class 2 inactive hazardous waste disposal site, registry number 7-04-027. The New York State Department of Environmental Conservation (NYSDEC) issued a Remedial Design(RD) work Assignment to Dvirka and Bartilucci Consulting Engineers(D&B) under D&B's State Superfund Standby contract with the NYSDEC. The RD for this site is being performed with funds allocated under the New York State

Superfund Program, as part of New York State's program to investigate and remediate hazardous waste sites.

The 93 Main Street Site is located on the southwest corner of Main Street and Arthur Street in the city of Binghamton, New York in a mixed residential and commercial neighborhood. The site is approximately one acre in area and consists of five parcels of land, 89-91 Main Street, 93 Main Street,25 Arthur Street, 27 Arthur Street and 29 Arthur Street.

The 89-91 Main Street and 93 Main Street properties are covered with the concrete slab, remains of former buildings, a poorly maintained driveway and dirt parking lot, weeds, and a fenced area containing the soil and drummed investigation derived waste (IDW) from previous investigations. The 25, 27 and 29 Arthur Street properties are vacant lots. The site is bordered by residential properties to the south and west, Arthur Street and a residential property to the east and Main Street to the north. The site and surrounding area are served by a municipal water supply system.

The 93 Main Street Site, which includes the 89-91 and 93 Main Street properties and the 25, 27 and 29 Arthur Street properties, has been used for residential and commercial purposes since the early 1900's. With the exception of McMahon Brothers Pest Control Company and a roofing company that occupied 93 Main Street beginning I1952, these properties were historically multi-family residences and commercial office space and included medical and legal offices, retail clothing, realty offices, and other small retail shops. Based on historical information, property use for 25, 27, and29 Arthur Street and 91 Main Street, with the exception of the early 1900's when the properties were utilized for light commercial purposes (e.g., blacksmith, travel agency, medical offices, etc.) was primarily residential.

From the early 1950's to the 1980's the McMahon Brothers Pest Control Company operated at the 93 Main Street Site primarily on the 93 Main Street and 89-91 Main Street parcels. The site was reportedly used as a pesticide/herbicide storage and handling facility for the company and there were allegations of spills having taken place at the site. Operations at the site ceased in the 1990's and the 93 Main Street building was reported to have been converted to an apartment building sometime following the end of site operations. In addition, a partially completed motel also occupied the site prior to 1999. The apartment building and motel were demolished by the City of Binghamton in 1999.

2.2 Job Hazard Analysis

The results of the remedial investigation (RI) indicated that the volatile organic compound (VOC) contaminants of concern in soil and groundwater were xylene, ethylbenzene, tetrachloroethene, chlorobenzene, and 1,2-dichloroethanane and the semivolatile organic compound (SVOC) contaminants of concern were 1,2,4-tichlorobenzene, naphthalene, 2-methylnaphthalene, 2,4,5-tichlorophenol, 2,4-dichlorophenol, pentachlorophenol, phenol, 2-chlorophenol, 1,4-dichlorobenzene, 2-

methylphenol and 4-nitrophenol, as well as the carcinogenic polyaromatic hydrocarbons (PAHs), benzo(a)anthracene, benzo(k)anthracene, chrysene, benzo(a)pyrene, bis(2-ethylhexyl)phthalate, benzo(b)fluoranthene and dibenzo(a,h)anthracene. The pesticide contaminants of concern identified were lindane, aldrin, dieldrin, 4,4'-dichlorodiphenyltrichloroethane (4, 4'-DDT), 4,4'-dichlorodiphenyldichloroaenthe (4,4'-DDD), 4 ,4'-dichlorodiphenyldichloroethylene (4,4'-DDE), heptachlor, heptachlor epoxide, 2,4-D, chlordane, endrin, endosulfan I, endosulfan II, beta-BHC and delta BHC.

Tables 2.2a through 2.2j contain the job hazard analysis information for this site and the planned hazard controls.

This table lists each task or operation required for this project. The potential for exposure to contaminants found in the site soils during previous investigations is identified for each task or operation.

Anticipated physical hazards are also identified. The final section in each task in Tables 2.2a through 2.2j list the control measures implemented to protect employees from the hazards identified. Tables 2.2a through 2.2j are located at the end of this HASP.

2.3 Employee Notification of Hazards and Overall Site Information Program

The information in **Tables 2.2a through 2.2j** is made available to all employees who could be affected by it prior to the time they begin their work activities. Modifications to this table are communicated during routine briefings.

Consistent with paragraph (i) of 29 CFR 1910.120 HAZWOPER, we also inform other contractors and subcontractors about the nature and level of hazardous substances at this site, and likely degree of exposure to workers who participate in site operations. Brian Spangler is responsible for providing site characterization information, this HASP, and modifications to it to other contractors and subcontractors working on this site.

3.0 SITE CONTROL

Brian Spangler is responsible for evaluating site conditions and for verifying that the site control program functions effectively. The site control program is updated regularly to reflect current site conditions, work operations, and procedures.

3.1 Site Map

A map of this site, showing site boundaries, designated work zones, and points of entry and exit is provided in Figure 3-1, at the end of this Section.

3.2 Site Access

Access to this site is restricted to reduce the potential for exposure to its safety and health hazards. During hours of site operation, site entry and exit is authorized only at the point(s) identified in Figure 3-1. Entry and exit at these points is monitored by Brian Spangler. When the site is not operating, access to the site is controlled by S&T Security.

Visitors to the site must register on the Security Log located in the Office Trailer or with Brian Spangler. Visitors are expected to comply with the requirements of this HASP. Visitors who want to enter contaminated areas of the site must provide documentation that they have the required training and medical evaluation and must receive a site-specific briefing about protecting themselves from site hazards, recognizing site zone demarcations, and following emergency evacuation procedures prior to entry. PPE for visitors is provided by the Project Manager.

3.3 Site Security

Security at this site is maintained during both working hours and non-working hours to prevent unauthorized entry; removal of contaminated material from the exclusion zone; exposure of unauthorized, unprotected people to site hazards; and increased hazards due to vandalism and theft.

The Project Manager is responsible for establishing and maintaining site security during working hours. This site takes the following measures for security during working hours:

* Security is maintained in the Support Zone and at Access Control Points to ensure only authorized entrants access the site.
* A barricade or other physical barrier is erected around the perimeter of the site to prevent unauthorized entry or exit.
* Signs have been posted around the perimeter of the site to warn of the site dangers and prohibition of unauthorized entry.

Horizon Environmental is responsible for establishing and maintaining site security during non-working hours.

3.4 Site Work Zones

This site is divided into three (3) major zones, described below and shown in Figure 3-1. These zones are characterized by the presence or absence of biological and chemical hazards and by the activities performed within them.

Zone boundaries are maintained at all times and the flow of personnel and equipment among the zones is controlled.

The site is monitored for changing conditions that may warrant adjustment of zone boundaries. Zone boundaries are adjusted as necessary to protect personnel and clean

areas. Whenever boundaries are adjusted, zone markings are also changed and workers are immediately notified of the change.

The following criteria were considered in establishing the site work zones:

* required clean-up activities
* sampling results for air and surface contaminants
* inside traffic patterns

Exclusion Zone

The Exclusion Zone is the area where hazardous substances are known or suspected to be present and pose the greatest potential for exposure. Remediation operations (site clean-up) are performed in the Exclusion Zone. At this site, the Exclusion Zone boundaries are marked by perimeter fencing.

Personnel and equipment will enter and exit the Exclusion Zone from the designated access points in the Contamination Reduction Zone (CRZ), shown in Figure 3-1.

Personnel in the Exclusion Zone will adhere to the following Standard Operating Procedures (SOPs):

Exclusion Zone SOPs

* Check in and out of this zone at the designated access point.
* Use the buddy system at all times (see Section 3.5 below)
* Wear the PPE required for this zone (see Section 6.0 of this HASP).
* Perform air sampling as required for this zone (see Section 7.0 of this HASP).
* Do not smoke, eat, or drink.
* Alert supervisor to signs of unanticipated hazards.
* Do not engage in horseplay.
* Monitor self and buddy for PPE condition, to include improper fittings, rips, tears, and/or damage as well as inappropriate behaviors or other signs of ill health..
* Use monitoring equipment and tools that are safe for the working environment.

Contamination Reduction Zone (CRZ)

The CRZ is located between the Exclusion Zone and the Support Zone (clean zone). Its primary purpose is for decontamination of workers and equipment. The CRZ also serves as a buffer between the Exclusion Zone and Support Zone that will minimize the potential for contamination to spread to the Support Zone and outlying areas. At this site, the CRZ boundaries are marked with plastic sheeting surrounding the decontamination pad.

Workers and equipment exit the Exclusion Zone through the designated access point(s) into the CRZ. Workers and equipment are then decontaminated in the CRZ, according to the procedures specified in the Decontamination section of this HASP. Workers and equipment then exit the CRZ into the Support Zone through the designated access points, shown in Figure 3-1.

Personnel in the CRZ will adhere to the following SOPs:

Contamination Reduction Zone (CRZ) SOPs

* Check in and out of this zone at the designated access point.
* Wear the PPE required for this zone (see PPE section of this HASP).
* Do not smoke, eat, or drink.
* Alert supervisor to signs of unanticipated hazards.
* Do not engage in horseplay.
* Monitor self and buddy for PPE conditions, including improper fittings, rips, tears, and/or damage.

Support Zone

The Support Zone is the clean area of the site, beyond the outer boundary of the CRZ. There should be no contamination in this zone. Administrative, clerical, and other support functions are based in the Support Zone.

The Support Zone is shown in Figure 3-1.

Workers and equipment enter and exit the CRZ into the Support Zone through the designated access points, shown in Figure 3-1.

Personnel in the Support Zone will adhere to the following SOPs:

Support Zone SOPs

* Check in and out of this zone from the CRZ at the designated site access point.
* Alert supervisor to signs of unanticipated hazards.
* Do not engage in horseplay.
* Perform air and surface sampling as required for this zone (see Exposure Monitoring section of this HASP).
* Maintain on-site communications with personnel in the EZ and CRZ.
* Maintain off-site communications with Emergency Response Services, NYS DEC, Laboratory, Disposal Facility, etc.
* Manage environmental and industrial hygiene samples
* Maintain supplies for PPE and operations
* Perform Human Resource Functions

* Maintain Records (Safety, Waste Disposal, etc.)

3.5 Buddy System

While working in the Exclusion Zone, site workers use the buddy system. The buddy system means that personnel work in pairs and stay in close visual contact to be able to observe one another and summon rapid assistance in case of an emergency. The responsibilities of workers using the buddy system include:

* Remaining in visual contact with partner,
* Providing partner with assistance as needed or requested,
* Observing partner for signs of heat stress or other difficulties,
* Periodically checking the integrity of partner's PPE, and
* Notifying the supervisor or other site personnel if emergency assistance is needed.

3.6 Site Communications

The following communication equipment is used to support on-site communications:

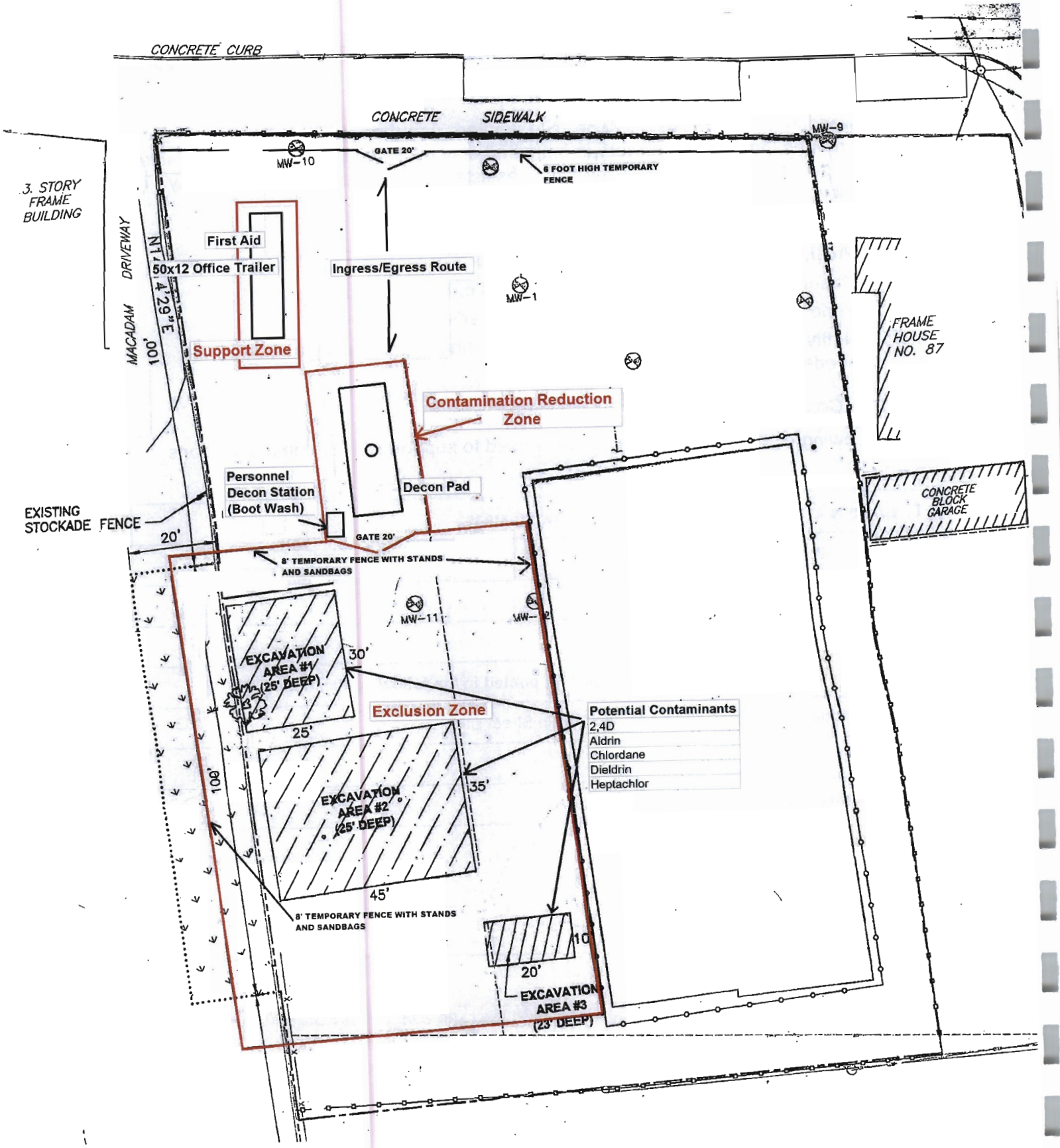
Telephones at this site are located in the following areas:
The office trailer
The Project Manager carries a cell phone

A current list of emergency contact numbers is posted in the following locations:
The office trailer and the posted sign at the 93 Main Street site

The following people will carry two-way radios:
The project manager
The excavator operator
Truck drivers
Site Safety Officer

Figure 3-1 Map of Site Boundaries, Work Zones, and Entry/Exit Points (Following Page)

Figure 3-1 Work Zones



4.0 TRAINING PROGRAM

The site training program is designed to ensure that workers receive the training they need to work safely. Site safety and health training requirements are based on the job hazard assessments contained in Section 2 of this HASP and relevant OSHA requirements.

At this site, the Project Manager oversees the implementation of this training program and is responsible for ensuring that employees are adequately and currently trained for all tasks they are asked to perform. Employees who have not been trained to a level required by their job function and responsibility are not permitted to participate in or to supervise field activities.

This training program addresses the following information:

* Initial training for site workers & supervisors
* Site briefings for visitors and workers
* Refresher training
* Training certification
* Emergency response training
* Site specific operations and hazards

4.1 Training for Site Workers

Personnel at this site must have successfully completed a 40-hour initial training course or an 8 hour refresher training course, if the initial training was completed more than 12 months prior to initiation of work on the site, consistent with the requirements established by OSHA in 29 CFR 1910.120. In addition, such personnel will receive 3 days of supervised field experience applicable to this site.

The training provided to these workers addresses:

* names of personnel and alternates responsible for site safety and health
* safety, health and other hazards present on the site
* use of PPE
* work practices by which the employee can minimize risks from hazards
* safe use of engineering controls and equipment on the site
* the site control plan detailed in Section 3 of this HASP
* medical surveillance requirements detailed in Section 5 of this HASP
* decontamination procedures detailed in Section 9 of this HASP
* the emergency response plan detailed in Section 10 of this HASP

4.2 Management and Supervisor Training

On-site managers and supervisors who are directly responsible for or who supervise workers engaged in hazardous waste operations receive, in addition to the appropriate level of worker HAZWOPER training described above, eight (8) additional hours of specialized supervisory training.

4.3 Refresher Training

All workers on this site, including managers and supervisors, receive 8 hours of annual HAZWOPER refresher training.

4.4 Training Certification

This site maintains written certification of the successful completion of applicable training requirements for all personnel. Training records are maintained up-to-date and are retained onsite in the Office Trailer.

4.5 Emergency Response Training

Emergency response training is addressed in Section 10 of this HASP, Emergency Response Plan.

4.6 Safety Meetings

The SO will conduct daily safety meetings that will be mandatory for all project personnel. The meetings will provide refresher courses for existing equipment and protocols, and will examine new site conditions as they are encountered. Additional safety meetings will be held on an as-needed basis.

5.0 MEDICAL SURVEILLANCE

The person with responsibility for ensuring that this medical surveillance program is implemented and maintained is Scott Clary. Mr. Clary will maintain documentation of medical exams for all site personnel.

All medical examinations and procedures are performed by or under the supervision of a licensed physician and are provided by Horizon Environmental Services to workers free of cost, without loss of pay, and at a reasonable time and place.

5.1 Site Medical Surveillance Program

The site medical surveillance program provides that:

a. Workers assigned to tasks requiring the use of respirators receive medical examinations to ensure they are physically capable to perform the work and use the equipment,

b. If a worker is injured, becomes ill, or develops signs or symptoms of possible over-exposure to hazardous substances or health hazards, medical examinations are provided to that worker as soon as possible after the occurrence and as required by the attending physician.

Personnel within the medical surveillance program receive medical examinations on the following schedule:

a. Prior to assignment: personnel covered by the medical surveillance program are medically examined prior to commencing work in contaminated areas of the site.

b. On an annual basis: personnel within the medical surveillance program receive medical exams at least every 12 months to provide for ongoing assessment of each worker's health status.

c. At termination of project or reassignment: personnel are offered the opportunity for a medical examination upon their termination of employment or reassignment to work where the worker is not exposed to hazardous materials or required to wear a respirator

d. Post-injury / illness: any worker who is injured, becomes ill, or develops signs or symptoms of possible over-exposure to hazardous substances or health hazards, receives a medical examination as soon as possible after the occurrence, with follow-up examinations provided as required by the attending physician.

The Medical Consultant for Horizon Environmental Services and this project is:

Dr. Raymond Gallon, MD

North Hills Internal Medicine
9335 McKnight Road
Pittsburgh, PA, 15237

6.0 Project Hazards and Control Measures

Anticipated work tasks as required by the Interim Remedial Measure Scope of Work include the following:

- Mobilization
- Site clearing and grubbing
- Removal of surficial debris, soil excavation and handling
- Regrading
- Cap Construction
- Drainage Controls Construction, Dewatering and Slope Stabilization
- Road Construction and Repair

- Fence Installation
- Equipment Decontamination
- Site restoration
- Demobilization

6.1 Hazard Identification and Control

Site-specific job tasks and the type of hazards that may be encountered are identified in Table 6-1, Hazard Analysis Matrix. The Hazard Analysis Matrix is used as a guide to identify potential hazards.

Table 6-1: Hazard Analysis Matrix

Hazards	Mobilization	Site Clearing	Soil Excavation/ Trenching, Regrading and backfilling	Material Handling	Site Restoration	Decontamination	Demobilization
COC Exposure	X	X	X	X		X	
Chemical Exposure			X	X		X	
Vehicular Collisions	X					X	X
Electrical	X	X	X	X	X	X	X
Fire /Explosion	X	X	X	X	X	X	X
Heat/Cold Stress	X	X	X	X	X	X	X
Overhead Utilities	X	X	X	X	X		X
Underground Utilities		X	X				
Noise		X	X	X			
Confined Space Entry			X				
Falls			X	X		X	
Poisonous Plants	X	X			X		X
Snakes/Spiders Insects	X	X			X		X

Based upon the hazard analysis of the tasks that will be conducted for the project, Table 6-2. Potential Hazards and Control, lists the general procedures and practices to follow to prevent injury or illness:

Table 6-2: Potential Hazards and Controls

Potential Hazard	Control
Exposure to site contaminants of concern	1. Stay up-wind of areas where COCs are generated whenever possible. 2. Minimize direct contact and contact time with contaminated media to prevent exposure. 3. Avoid walking through discolored areas, puddles, leaning on drums, or contacting anything that is likely to be contaminated, unless wearing the appropriate PPE. 4. Do not eat, drink, smoke or apply cosmetics in EZ or CRZ. 5. Wear appropriate PPE when it is required to come in contact with contaminated media or surfaces. Minimum of Level D PPE must be worn when on project site. 6. Conduct air monitoring for contaminants. 7. Utilize wet methods (spraying ground, wet drilling, etc.) when visible signs of airborne dust are generated. 8. Upgrade PPE as necessary when required by the HASP. 9. If unknown materials are encountered, call the SO. The SO will investigate and, if necessary, work with the HRS to safely address the unknown material.
Exposure to Hazardous Materials used	1. All materials with hazardous components brought on-site by HORIZON personnel or subcontractors must be labeled and the MSDS must be available on-site. 2. MSDSs are kept in the Hazard Communication binder that is kept in the HORIZON Trailer. 3. Complete HAZCOM training. 4. Use hazardous materials only for their intended purpose with the PPE, safe handling and storage procedures and engineering controls specified by the MSDS. 5. Contact the SO if unsure of how to safely work with a material.

Table 6-2: Potential Hazards and Controls – Continued

Potential Hazard	Control
Working From Heights	1. Ensure Fall Protection training for applicable employees is completed prior to initiating work activities. 2. While working from elevated levels greater than 6 feet, ensure that all employees have 100% fall protection (eg. full body harnesses and lanyards, netting, etc.) and guardrails. 3. Consult the SO, regarding the type of protection systems to use. 4. Tools should always be hung or put into a belt whenever possible. 5. Inspect all fall protection equipment and anchoring points prior to their use.
Vehicular Traffic	1. Wear traffic safety vest, hard hat, safety glasses and other appropriate PPE when vehicle hazard exists. 2. Use cones, flags, barricades, and caution tape to define work area. 3. All construction vehicles shall have flashing lights and back-up alarms. 4. For public roads use vehicle with flashing lights to block work area. 5. Engage police detail for high-traffic situations on public roads. 6. Refer to Section 3.0, Site Control: Work Zones, for additional details and guidance.
Inclement Weather	1. Stop outdoor work during electrical storms and other extreme weather events 2. Take cover indoors or in vehicle. 3. Listen to local forecasts for warnings about severe weather such as tornados, hurricanes, and flash floods.

Table 6-2: Potential Hazards and Controls – Continued

Potential Hazard	Control
Confined Space Entry (CSE)	1. Ensure personnel assigned meet CSE training requirements. 2. Complete CSE permit. Post sign. 3. Ensure pre-entry CSE safety meeting is conducted. 4. Remove vault cover using proper lifting techniques. 5. Promote natural ventilation by opening the space to fresh air, if needed utilize mechanical purge ventilation. 6. Conduct remote air monitoring prior to entry. 7. Attendant can act as CSE Supervisor and must be present at CSE entry point when entrant is in CSE. 8. Access work for fall hazards and ensure provisions for non-entry rescue have been met. 9. Enter only when safe; conduct continuous air monitoring.
Utility Lines Contact	1. Contact Dig Safely 800-962-7962 to have utility lines marked prior to excavation/trenching. 2. Refer to site drawings or customer interviews if on private property for utility locations. 3. Hand dig 3 to 5 feet down and 5 feet each side of utility marker to avoid breaking utility lines.
Noise	1. Wear hearing protection whenever you need to raise your voice above normal conversational speech due to a loud noise source such as a drill rig, jackhammer, cut saw, air compressor, blower or other heavy equipment; this much noise indicates the need for protection. 2. Hearing protection is required when measured sound pressure levels (SPL) exceed 85 dBA where employees stand or conduct work. 3. Conduct noise monitoring of suspected high noise operations to determine hearing protection requirements.

Table 6-2: Potential Hazards and Controls – Continued

Potential Hazard	Control
Electric Shock	1. Maintain appropriate distance from overhead utilities. 2. 10-foot minimum clearance from power lines required; if within ten feet it has to be shielded. 3. Use ground-fault circuit interrupters as required. 4. Perform LO/TO procedures 5. Use three-pronged plugs and extension cords and maintain in good working condition. 6. Follow code requirements for electrical installations in hazardous locations.
General Physical Injury	1. Wear Class A or B hard hats and safety glasses when on-site. 2. Wear Gloves when handling equipment or materials. 3. Maintain visual contact with the equipment operator and wear orange safety vest when heavy equipment is used. 4. Avoid loose-fitting clothing. 4. Prevent slips, trips, and falls; keep work area uncluttered. 5. Keep your body parts and hair away from moving parts (i.e., augers).
Back Injury	1. If you must lift, plan the lift before doing it. 2. Check your route for clearance. 3. Use a mechanical lifting device or a lifting aid where appropriate. 4. Bend at the knees and use leg muscles when lifting. 5. Use the buddy system when lifting heavy or awkward objects. 5. Do not twist or jerk your body while lifting.

Table 6.2: Potential Hazards and Controls – Continued

Potential Hazard	Control
Heat Stress	1. Increase water intake while working. 2. Minimize and/or avoid alcohol intake the night before working in heat stress situations. 3. Increase number of rest breaks and/or rotate workers in shorter work shifts; take breaks in shaded areas. 4. Watch for signs and symptoms of heat stress. 5. Plan work for early morning or evening during hot months. 6. Use ice vests when necessary. 7. Rest in cool, dry areas. 8. In the event of heat stroke bring the victim to a cool environment and initiate first aid procedures.
Cold Stress	1. Take breaks in heated shelters when working in extremely cold temperatures. 2. Remove the outer layer of clothing and loosen other layers to promote evaporation of perspiration, upon entering the shelter. 3. Be aware of cold stress symptoms such as shivering, numbness in the extremities, and sluggishness. 4. Drink warm liquids to reduce the susceptibility to cold stress.
Cleaning Equipment	1. Wear appropriate PPE to avoid skin and eye contact with isopropyl alcohol, alconox, or other cleaning materials. 2. Stand upwind to minimize any potential inhalation exposure. 3. Dispose of spent cleaning solutions and rinses as contaminated material.

Table 6.2: Potential Hazards and Controls – Continued

Potential Hazard	Control
Insects	1. Tuck pants into socks. 2. Wear long sleeves. 3. Use insect repellent. 4. Avoid contact - always looking ahead before walking, standing, sitting, leaning, grabbing, lifting or reaching-in-to an area. 5. Check for signs of insect/spider bites, such as redness, swelling, and flu-like symptoms. 6. Use buddy system to check each other for signs of insect/spider bites. 7. Remove ticks immediately with fine tipped tweezers by grasping the tick as close to your skin as possible and gently pulling straight out. Do not squeeze the tick's body as this may inject fluids into you. Wash the bite area of skin and apply antiseptic.
Poisonous Plants (Such as Poison Ivy, Oak or Sumac)	1. Don't enter areas infested with poisonous plants. 2. Immediately wash any areas that come into contact with poisonous plants. 3. Protect exposed skin area with gloves and Tyvek™ suits. 4. Be aware that the oil from the plant can be carried on boots, clothes and equipment. Always protect skin. 5. If you have known allergies, carry an Epi-Pen at all times and notify co-workers that you are allergic.
Poisonous Snakes	1. Avoid walking in areas where snakes may nest or hide. Always look ahead to where walking for signs of snakes. 2. Use extreme caution when moving or lifting objects which could be used by snakes as cover. 3. Never reach under or behind objects or into other areas where snakes may hide. 4. Wear sturdy leather boots.

Table 6.2: Potential Hazards and Controls – Continued

Potential Hazard	Control
Portable Ladders	1. Make sure ladder rungs are sturdy and free of cracks. 2. Use ladders with secure safety feet. 3. Pitch ladders at 1 foot away for every 4 feet up. 4. Secure ladder at the top or have another person at the bottom to help stabilize it. 5. Do not use ladders for access to unstable areas. 6. Use non-conductive ladders near electrical wires. 7. Do not hand-carry loads on a ladder. 8. Do not try reaching so far that you lose your balance; move the ladder. 9. Non-skid feet or spurs may prevent a ladder from slipping on a hard, smooth surface. 10. Do not stand on the ladder's top three rungs. 11. A damaged side rail may cause one side of a ladder to give way. 12. Ladders used to reach a walking surface or roof must extend at least 3 feet beyond. 13. Extension ladders need both locks holding to prevent overloading a rail. 14. Step ladders should be securely spread open. Never use a folding step ladder in an unfolded position. 15. Electrical shock can occur with metal or wet wooden ladders. Not only is the shock itself dangerous, but it can cause falls resulting in injury.

Table 6.2: Potential Hazards and Controls – Continued

Potential Hazard	Control
Fire	1. Smoke only in designated areas. Extinguish in an appropriate container. 2. Keep flammable liquids in closed containers. 3. Keep site clean; dispose of combustible debris such as paper. 4. Follow Hot Work Safety Procedures when welding, brazing, grinding, and cutting or doing other hot work. 5. Isolate flammable and combustible materials from ignition sources. 6. Keep an appropriate extinguisher(s) within 75 feet of areas with potential fire hazards. 7. Train employees to use fire extinguishers.
Static Electricity	1. Do not create static discharge in flammable atmospheres. 2. Electrically bond and ground pumps transfer vessels, tanks, drums, bailers and probes, when moving liquids. 3. Electrically bond and ground vacuum trucks and the tanks they are emptying. 4. Do not splash fill containers with flammable liquids.

Table 6.2: Potential Hazards and Controls – Continued

Excavation/ Trenching	1. Locate and mark all underground utilities prior to any excavation operation. 2. Reduce injuries from falling objects by keeping all excavated soils and loose materials 2 feet or more feet from the edge of the excavation. 3. A Stairway, ladder, ramp, or other safe means of egress must be located in trench excavations that are four feet or more in depth. 4. Use pylons, cones, flags, or tape to prevent unauthorized traffic from entering the trenching and excavation areas. 5. Use guardrail systems, fences or barricades for excavations 6 feet or greater. 6. Inspect excavations, adjacent areas, and protective systems daily, and after every rainstorm, by a competent person. 7. Do not allow employees to work in excavations where water has accumulated.
Spills or releases of hazardous materials	Prevent problems by documenting the location of underground lines (e.g., product, sewer) before starting site work. Ensure emergency response activities have been completed prior to rapid response field activities. Conduct hazard assessment of project site and communicate findings through a "Daily Safety Meeting" to all HORIZON employees and subcontractors prior to field activities. Communicate applicable HORIZON health and safety programs to other contractors on-site that may be impacted and coordinate field activities with them.

Appropriate training for specific hazards must be completed by field personnel prior to initiating work activities. For additional information consult with the SO.

6.2 Site Specific Hazards

Various site specific hazards are expected to occur during site activities. The following sections outline potential hazards to be encountered and procedures to control each hazard.

6.2.1 Proximity to Heavy Equipment

Working around heavy equipment poses obvious physical hazards. Workers could easily be injured or killed if hit by heavy equipment. These hazards can be reduced by minimizing the number of workers and equipment in the same area, responding to backup alarms, maintaining a clear field of view for drivers and operating equipment at safe speeds.

Heavy equipment will be operated under the following conditions:

- The operation of heavy equipment will be limited to authorized personnel specifically trained in its operation.
- The operator will use the safety devices provided with the equipment, including seat belts. Backup warning indicators and horns will be operable at all times.
- While in operation, all personnel not directly required in the area will keep a safe distance from the equipment.
- Personnel directly involved in an activity will avoid moving into the path of operating equipment. Areas blinded from the operator's vision will be avoided and barricaded as necessary to prevent inadvertent entry into blind spots.
- Additional riders are not allowed on equipment unless it is specifically designed for that purpose.

6.2.2 Slip/Trip/Fall Injuries

As with any construction project, hazardous waste site work poses numerous slip, trip and fall hazards. These hazards can be reduced by avoiding work on slippery surfaces, wearing slip resistant footwear, working with a low center of gravity and making slow and deliberate movements. Personnel must be aware that the protective equipment worn may limit dexterity and visibility and may increase the difficulty of performing some tasks.

6.2.3 Excavation Safety

Work at the site requires the excavation of contaminated soil. It may be necessary to dewater the excavation areas. Exposure to contaminants in the groundwater and surface is possible during dewatering. Work area and perimeter air monitoring will be conducted during these activities. Dust control measures may have to be implemented if soil is dry and dusty during excavation.

If entry into the deep excavations is required it will be done in accordance with 29 CFR 1926 Subpart P. The excavations will be inspected by a competent person before entry. The Competent Person for this project will be designated by the Project Manager.

Additionally, the following requirements will be adhered to while excavating and trenching:

- Prior to any excavation operations, all underground utilities, if any, must be located and marked,
- To reduce injuries from falling objects, all excavated soils and other loose material shall be kept 2 or more feet from the edge of the excavation,
- A stairway, ladder, ramp, or other safe means of egress must be located in trench excavations that are four feet or more in depth so as to require no more than 25 ft. of lateral travel for employees,

- To prevent unauthorized traffic from entering the trenching or excavation areas, pylons, cones, flags or tape shall be used to mark the areas,
- Each employee at the edge of an excavation 6 feet (1.8 m) or more in depth shall be protected from falling by guardrail systems, fences, or barricades,
- Daily inspections of excavations, the adjacent areas, and protective systems will be made by a competent person for evidence of possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. The inspection will be conducted prior to start of work and as needed throughout the shift,
- Inspections will also be made after every rainstorm or other hazard-increasing occurrence. If the competent person finds evidence of a hazardous condition after an inspection, employees must be removed from the hazardous areas until necessary precautions are taken for protection,
- Employees will not work in excavations with accumulated water or in excavations in which water is accumulating, unless adequate precautions to protect employees have been taken. The precautions may vary with each situation, but may include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

Table 1.3: Safety Requirements for Working in Roadways and Excavations

WORKING IN STREET OR ROADWAY
• Wear traffic vest and hardhat when vehicle hazard exists.
• Use cones, flag-mounted cones, caution tape and/or barricades.
• Use vehicle strobe light and block area with truck.
• Develop traffic pattern plan for high traffic situations:
  • Use flag person,
  • Use flashing arrow sign,
  • Use "MEN WORKING" signs liberally,
  • Obtain lane closing permits, and
  • Engage police details.

WORKING AT EXCAVATION/TRENCHING SITES • "Competent person" is required per OSHA 29 CFR 1926 Subpart P. • Safety guard open excavations by restricting unauthorized access. • Highlight work area using prominent warning signs (cones, saw horses/barricades and signage) placed a minimum of 10' back from excavation opening. • Maintain zone definition along perimeter with **continuous string** of yellow or orange caution tape.
EXCAVATIONS LEFT UNATTENDED OR OVERNIGHT **Use one of the following methods to address these situations:** • Surround entire perimeter with plastic or cloth construction net fencing. Anchor fence to ground using steel posts driven into ground. Space out posts no greater than 8 feet apart. Fence height minimum 4-feet high. Fence material must be of a quality capable of withstanding a pressure of 200 pounds. Place fence a minimum of 10 feet back from excavation opening. • Place 8-foot long barricades affixed with flashing lights end to end with 4-foot high construction net fence attached to barricades. • Utilize temporary curbing or concrete "jersey" barriers affixed with flashing signal lights or other effective warning signs.

6.2.4 Explosive Gases / Fire Prevention

The potential for explosive atmospheres exist when the following conditions occur:

- The levels of combustible gases (such as methane) accumulate to within the explosive limit range,
- The combustible gas is in the presence of oxygen,
- There is a source of heat or ignition.

Explosive atmospheres exist when the concentration of explosive gas is between the lower explosive limit, the minimum concentration of a gas or vapor that will combust or burn, and the upper explosive limit, the maximum concentration of a gas or vapor that will burn.

Explosive atmospheres can be controlled as follows:

- Monitoring air concentrations for explosive gas with a combustible gas indicator (Oxygen/LEL meter). Concentrations above 10% LEL are considered dangerous and work should be stopped,
- Using remote equipment and instrumentation to conduct tasks so that personnel are removed from the area of explosive gas,
- Using intrinsically safe equipment.

In addition, the following rules will be enforced to prevent fires:

- Smoking is prohibited at, or near, operations that may present a fire hazard.
- Flammable and/or combustible liquids must be handled only in approved, properly labeled metal safety cans equipped with flash arrestors and self-closing lids.
- Transfer of flammable liquids from one container to another will be done only when the containers are electrically interconnected.
- The motors of equipment being refueled will be shut off.
- All flammable/combustible liquids stored in metal drums will be equipped with self-closing safety faucets, vent bung fittings, and drip pans. Drums containing flammable material will be properly grounded.
- An adequate number of fire extinguishers will be kept in the exclusion zone, contaminant reduction zone and the support zone.

6.2.5 Overhead Work

Falling objects from overhead work can cause serious, debilitating head injuries. OSHA requires use of head protection (hard hats) at all times when overhead work is taking place.

6.2.6 Buried or Covered material

Buried or covered material can pose a risk to site workers. Objects, trenches, and pits may be covered by debris or snow. Care must be taken when first working in any area to assure buried or covered hazards do not exist.

6.2.7 Weather

In addition to heat and cold extremes, severe rain, snow or electrical storms can also pose risks to site workers. Driving hazards are also increased in poor weather. Work may need to be stopped under such conditions. Outside work should be suspended during electrical storms.

6.2.8 Sharps - nails, glass, etc.

Sharp objects and debris are common at construction sites. Care must be taken

to prevent stab and cut wounds. Proper PPE including steel toes, steel shank boots and work gloves can minimize this risk.

6.2.9 Uneven Terrain

Working on uneven terrain poses a series of slip, trip and fall hazards. Care must be taken when working in uneven terrain. This hazard is compounded when wearing PPE. Decreased mobility and vision (respirator) may increase this risk.

Operating heavy equipment on uneven terrain can also be hazardous. Equipment should be operated up and down slope; side hill operation should be avoided. If equipment starts to slip sideways on a slope, turn down grade immediately.

6.2.10 Use of Power and Hand Tools

Only tools with grounded three wire plugs should be used. GFIs must be used when using power tools outside or in wet areas. Tools must be checked frequently for defects and maintained properly. All tools must be unplugged before making adjustments or repairs.

The following will also reduce the hazard associated with working with power and hand tools:

- Only use tools for which you have been properly trained.
- Maintain all equipment guards and never remove or block.
- Make frequent inspections for defective blades, wheels, cords and plugs.
- Assure all electrical tools are properly grounded.
- Never use grinding wheels in excess of their safe operating speed.
- Air hoses on pneumatic tools should not be disconnected until pressure is relieved.
- Compressed oxygen must never be used to power pneumatic equipment.
- Hand tools must be kept in good repair.
- Tools must only be used for the purpose they were designed.
- Tools must never be left on ladders, scaffolds or other area where they will create a trip or fall hazard.
- Tools must be properly stored when not in use.

6.2.11 Lifting

Back injuries are the most common injury in the construction industry. Injuries

are usually caused by improper lifting techniques. The following lifting techniques will help reduce lifting injuries:

- Inspect the work area prior to lifting for trip hazards.
- Set feet solidly and well apart, with one foot slightly ahead of the other.
- Crouch as close to the load as possible, with the legs bent.
- Keep back as straight as possible.
- Do not twist or turn during lifting.
- "Lift with your brain - then lift with your back."

6.2.12 Fueling Vehicles

All equipment must be shut off, with ignition off, during fueling operations. Smoking is not allowed near fueling stations.

6.2.13 Electrical Hazards

Any work performed in areas where employees, or the equipment they are operating, could come in contact with, or enter into close proximity to, energized electrical systems will be performed in accordance with OSHA standards and N.Y.S. High Voltage Proximity Act.

Prior to an excavation, utility clearances must be obtained and documented.

Any time work is being performed on equipment capable of storing and releasing energy, all work will be completed in accordance with 29 CFR 1910.147, Lockout/Tagout.

6.2.14 Physical Hazards

6.2.14.1 Heat and Cold Stress

Working in personal protective clothing can easily compound the problem of heat stress on a hazardous waste site. Heat stress may occur even in moderate temperatures and may include heat rash, heat cramps, heat exhaustion and heat stroke.

As your body temperature decreases, the body maintains its temperature by reducing blood flow to the skin. This causes marked decrease in skin temperature, especially in the extremities (feet, hand, nose, ears, etc.).

Individuals who may be at increased risk of heat stress include:

- Workers doing heavy labor that become fatigued and/or wet from either sweating or exposure to water.
- Workers who are taking certain medications (sedatives) or who drink alcohol.
- Workers with circulatory system problems.

- Workers who are not physically fit or who are not acclimated to working in the cold.

Harmful effects of working in the cold include frostbite and hypothermia. Frostbite occurs when parts of the body freeze. Toes, fingers, earlobes and noses are most susceptible to frostbite.

Hypothermia occurs when the body is no longer capable of maintaining its core temperature. Hypothermia can result in hallucinations, sleepiness, irregular heartbeat, unconsciousness and death.

6.2.14.2 Heat/Cold Stress Monitoring Program

When ambient temperatures exceed 70 degrees Fahrenheit, the Site Safety and Health Supervisor shall begin monitoring employees for signs of heat stress. When ambient temperatures exceed 80 degrees Fahrenheit the Site Safety and Health Supervisor shall monitor for heat stress using the "Brouha Guideline". The "Brouha Guideline" uses heart rate to monitor an individual's response to heat stress. The following procedure shall be used to determine if an employee requires additional rest time.

- Heart rate should be measured for 30 seconds by the radial pulse as early as possible in the rest period. The heart rate at the beginning of the rest period should not exceed 110 beats per minute. If the heart rate exceeds 100 beats per minute, the next work period shall be shortened by 33%, while the rest period is extended accordingly. If the heart rate exceeds 110 beats per minute at the beginning of the next rest period, the next work period shall be reduced an additional 33%. This procedure shall continue until the heart rate is maintained below 110 beats per minute.

Heat stress may be combated through proper training, fluid intake, acclimatization and work/rest regime.

When temperatures fall below 45 degrees F, the Site Safety and Health Supervisor shall begin monitoring employees for signs and symptoms of cold stress, including fatigue, irritability, euphoria, drowsiness, uncontrolled shivering and frost bite. Removing employees from the cold or providing barriers and insulated clothing shall be administered based on the severity of the symptoms.

6.2.14.3 Preventing Heat Stress

Heat stress can be prevented by taking the following actions:

- Drinking adequate amounts of liquid throughout the day, 4-6 quarts may be necessary.
- Maintain (or obtain) good physical fitness.

- Utilize your training and recognize signs and symptoms of heat stress.
- Monitor yourself and your "buddy" for signs of heat stress.
- Allow your body time to acclimate to the environment.
- Utilize a work/rest regime.
- Utilize engineering controls, as feasible.

6.2.14.4 Preventing Cold Stress

Cold stress can be prevented by:

- Wearing several layers of loosely fitted dry clothes. An outer layer of water and wind proof clothing may be necessary.
- Drinking warm liquids.
- Changing clothing if you get wet from sweating or exposure to water.
- Taking breaks in warm shelter to prevent sleepiness, shivering or pain in your extremities.

6.2.15 Noise

Requirements set forth in the Hearing Conservation Regulations (29 CFR 1910.95) will be adhered to during work on-site. Hearing protection will be provided where sound pressure levels exceed 85 dBA. The Site Safety and Health Supervisor shall identify areas of high noise that require hearing protection. If the SO determines that noise levels are excessive, barriers or increased distance will be used to minimize worker exposure when feasible.

6.2.16 Confined Space Entry

Should confined spaces entry be necessary it will be done in accordance with 29 CFR 1910.146, Confined Space Entry.

6.2.17 Illumination

Illumination levels in the working zone shall be maintained at a minimum of 10-foot candle. If levels fall below this, supplementary lighting will be provided.

6.2.18 Material Handling

Proper material handling procedures shall be utilized during all material handling activities. The following general material handling rules will be followed:

- Use good back posture when lifting,

- Never walk under a suspended load,
- Always wear a hard hat and foot protection,
- Only use qualified equipment operators,
- Be aware of contaminated equipment,
- Never walk in front of moving equipment,
- Keep all loose clothing away from moving and mechanical parts,
- Never add fuel to running equipment.

6.2.19 Hot work

All hot work will be done only after obtaining a permit. A new permit is required at the start of each work shift, and for each new location where hot work is being performed. Each site will have a person designated as fire watch. They will have immediate access to a fire extinguisher, and their sole responsibility will be fire watch.

Torch cutting of steel structures can result in exposure to hazardous levels of lead. Do not conduct any torch cutting activities without contacting the Health and Safety Coordinator.

6.2.20 Biological Hazards

The possibility of exposure to Biological hazards is limited primarily to insects, rodents, snakebites and poisonous plants. If other biological hazards are found on-site, the Site Safety and Health Supervisor will communicate the location of these hazards to Horizon personnel, and work with them to eliminate the hazard.

6.2.21 Sanitation

Site Sanitation will be maintained according to OSHA requirements.

6.2.21.1 Break area

Breaks must be taken in the SZ, away from the active work area after site personnel go through decontamination procedures. There will be no smoking, eating, drinking, or chewing gum or tobacco in any area other than the SZ.

6.2.21.2 Potable water

The following rules apply to all field operations:

* Potable water must be kept away from hazardous materials or media, and contaminated clothing.
* Portable containers used to dispense drinking water must be capable of being tightly closed, and must be equipped with a tap dispenser. Water must not be consumed directly from the container (drinking from the tap is prohibited) nor may it be removed from the container by dipping.

* Containers used for drinking water must be clearly marked and shall not be used for any other purpose.
* Disposable drinking cups must be provided. A sanitary container for dispensing cups and a receptacle for disposing of used cups is required.

6.2.21.3 Sanitary Facilities

Access to facilities for washing before eating, drinking, or smoking or alternate methods such as waterless hand-cleaner and paper towels will be provided

6.2.21.4 Lavatory

If permanent toilet facilities are not available, an appropriate number of portable chemical toilets will be provided.

7.0 PERSONAL PROTECTIVE EQUIPMENT

This Section of the HASP describes how personal protective equipment (PPE) is selected and used to protect workers from exposure to hazardous substances and hazardous conditions on this site. Exposure hazards from volatile organic compounds, semi-volatile compounds and pesticides/herbicides found in the site soils in the ground water are considered. The following topics are addressed in this Section:

* PPE selection criteria
* Site specific PPE ensembles
* Work mission duration
* Training in use of PPE
* Respiratory protection
* Hearing conservation
* PPE maintenance & storage

The person with the overall responsibility for implementing the PPE program on site is the Project Manager, assisted by the SO.

7.1 PPE Selection Criteria

Site safety and health hazards are eliminated or reduced to the greatest extent possible through engineering controls and work practices. Where hazards are still present, PPE is used to provide additional protection for employees.

An initial level of PPE is assigned to each task to provide an adequate barrier to potential exposure hazards. Initial PPE ensembles are selected based on the anticipated route(s) of entry of biological and chemical hazards and their concentration. It is anticipated that Level C, Modified Level C and Level D PPE ensembles will be used during this project and that Level A & B will be unnecessary (see 29CFR 1910.120 for a discussion of PPE ensemble levels).

7.2 Components of PPE

Site-specific PPE ensembles and materials are identified below and in Table 7-2. All PPE is used in accordance with manufacturers' recommendations.

Level C

Chemical-resistant clothing (two-piece chemical-splash suit or disposable chemical-resistant overalls)
Outer gloves, chemical resistant
Inner work gloves chemical resistant
Booties-outer, chemical-resistant, disposable
Cotton clothing
Hearing protection
Full-face or half-face air purifying respirator (NIOSH certified)
Particulate and/or Organic vapor cartridges
Hardhat
Safety boots-steel toe and shank, chemical-resistant
Safety glasses or chemical splash goggles, if wearing half face respirator

Modified Level C

Chemical-resistant clothing (two-piece chemical-splash suit or disposable chemical-resistant overalls)
Outer gloves, chemical resistant
Inner work gloves chemical resistant
Booties-outer, chemical-resistant, disposable
Cotton clothing
Hearing protection
Hardhat
Safety boots-steel toe and shank, chemical-resistant
Safety glasses or chemical splash goggles

Level D

Booties-outer, chemical-resistant, disposable
Cotton clothing
Hardhat
Hearing protection
Outer gloves, chemical resistant
Protective coverall
Safety boots-steel toe and shank, chemical-resistant

Table 7-2 Site-Specific PPE Ensembles

Equipment	Model/Material		Level C	Modified Level C	Level D
Air purifying respirator (APR)	Model:		x		

Table 7-2 Site-Specific PPE Ensembles				
Equipment	**Model/Material**	**Level C**	**Modified Level C**	**Level D**
	Cartridge: P100/OV	x		
Fully Encapsulating Chemical Protective Suit				
Hooded Chemical Resistant Clothing/Suit		x	X	
Booties, outer, chemical-resistant		x	X	x
Coveralls				x
Inner chemical resistant gloves		x	X	
Outer chemical resistant gloves		x	X	x
Steel toe/shank boots		x	X	x
Chipping Protective Clothing				x
Hearing Protection		x	X	x
Hard Hat		x	X	x
Safety Glasses		x	X	x

Use of Level C Protection

Employees use Level C protection during tasks that have or potentially have the following characteristics:

* Airborne concentrations of contaminants exceed 50% of any occupational exposure limit established by OSHA or, in the absence of OSHA limits, a recognized exposure limit.
* During soil disturbance activities until an initial exposure assessment has been completed.
* After a satisfactory initial exposure assessment whenever on-going periodic personal and area air monitoring indicates a potential that airborne contaminant concentrations may exceed the action levels established by this HASP.

At a minimum, cartridges and canisters used with air-purifying respirators on this site will be changed on a monthly basis. Additionally, cartridges and canisters will be replaced when any of the following occurs:

* A NIOSH-approved end of service life indicator (ESLI) is activated,
* Inhalation is restricted, or
* Warning properties (chemical odors, tastes or physical irritation) are noted

If warning properties (chemical odors, tastes or physical irritation) are noted, employees will immediately leave the work area and notify their Health and Safety Technician or the site safety and health officer.

Use of Modified Level C Protection

Employees use Modified Level C protection during tasks that have or potentially have the following characteristics:

* During soil disturbance activities when the initial exposure assessment has shown that the airborne concentrations of contaminants are less than 50% of any occupational exposure limit established by OSHA or, in the absence of OSHA limits, any recognized exposure limit.

If warning properties (chemical odors, tastes or physical irritation) are noted, employees will immediately leave the work area and notify their Health and Safety Technician or the site safety and health officer.

Use of Level D Protection

Workers will use Level D protection during tasks that have the following characteristics:

* An initial exposure assessment indicates that exposures to site contaminants during the task will be below 50% of the appropriate occupational exposure limits
* There is low potential for skin contact with any site contaminants

7.3 Criteria for PPE Upgrades and Downgrades

The level of PPE is assessed based on the criteria in Table 7-2b below.

The Safety Officer has the authority to upgrade or downgrade PPE in a timely manner to respond to changing site conditions and to protect worker health and safety. Routine evaluation of the PPE program is conducted as identified in Section 6.7 below.

Table 7-1 Action Levels/Criteria for PPE Upgrades and Downgrades

Level of PPE	Action Level/Criteria for PPE Upgrade	Required Modification for Action Level/Criteria	Action Level/Criteria for PPE Downgrade	Required Modification for Action Level/Criteria
D	Skin Contact	Upgrade to Modified Level C PPE	N/A	N/A

Table 7-1 Action Levels/Criteria for PPE Upgrades and Downgrades				
Level of PPE	**Action Level/Criteria for PPE Upgrade**	**Required Modification for Action Level/Criteria**	**Action Level/Criteria for PPE Downgrade**	**Required Modification for Action Level/Criteria**
D	VOC exceed 5 ppm or Dust exceed 250 ug/m3 above background	Upgrade to Level C PPE	N/A	N/A
Modified C	VOC exceed 5 ppm or Dust exceed 250 ug/m3 above background	Upgrade to Level C PPE	No Skin contact	Down grade to Level D
C	VOC exceed 50 ppm above background Dust exceed 2500 ug/m3 above background	Stop Work	VOC is Less than 5 ppm and Dust is less than 250 ug/m3 above background	Down grade to Modified Level C
B	N/A	N/A	N/A	N/A

7.4 Work Mission Duration

The Project Manager identifies task-specific work duration based on the following:

1. Physiological requirements of the task
2. PPE level for the task
3. Ambient temperature and humidity
4. Respiratory protection capacity (air supply or cartridge change requirements)
5. Acclimatization of the work force to site and task conditions.

The Project Manager communicates the task-specific work duration during daily pre-entry briefings. Work duration is re-evaluated throughout the day in response to changes in working conditions.

7.5 Training

Employees receive general training regarding proper selection, use and inspection of PPE during initial HAZWOPER training and subsequent refresher training. Site-specific PPE requirements, including task specific PPE, ensemble components, cartridge/canister service times, and inspection procedures are communicated as identified in Section 4, Training.

7.6 Respiratory Protection

Requirements set forth in the Respiratory Protection Regulations (29 CFR 1910.134) will be adhered to during work on-site. The SO shall monitor areas that have potential to produce contaminant exposure that require a PPE upgrade to level C. If the SO determines that

contaminant exposure requires a PPE upgrade to level C, workers will be required to stop work and leave the work area until the contaminant exposure allows a downgrade in PPE to modified level C or Level D and the SO determines work may resume.

7.7 Hearing Conservation

Noise monitoring will be performed, if necessary, in accordance with OSHA requirements. Noise levels can be monitored in the field with either a Type I or Type II Sound Level Meter (SLM). Noise dosimeter readings can also be obtained to determine the percent (%) noise dose. Noise levels and percent (%) dose measured are then compared to limits listed in OSHA standard 29 CFR 1910.95, Hearing Conservation.

Action levels listed in Table 12, Noise Monitoring, would trigger upgrade in PPE to include appropriate hearing protectors (muffs or plugs) or initiate possible noise control engineering. Noise monitoring equipment must be calibrated prior to use each shift and checked at the end of the shift to determine accuracy. When collected, noise readings must be recorded .

Selection of hearing protection must match the employees' needs and the ability to attenuate noise below 90dBA. Each hearing protection device (muff or plugs) has a Noise Reduction Rating (NRR) assigned by the U.S. Environmental Protection Agency (EPA). Use the following formula to calculate the hearing protector's effectiveness:

Noise Reading (dBA) - (NRR - 7dB) = Exposure Level

The exposure level should be less than 90 dBA

Table 7-2: Noise Monitoring

Instrument	Measurement	Action
Type I or Type II SLM - Calibrate Before Use		
	>80 dB(A) - 85 dB(A)	Hearing protection recommended.
	>85 dB(A) - 90 dB(A)	Hearing protection required.
	>90 dB(A) - 115 dB(A)	Hearing protection required. Investigate use of engineering and administrative controls.
	> 115 dB(A)	Stop work. Contact HSC and SO.

7.8 PPE Maintenance and Storage

Personal protective equipment is stored and maintained in accordance with the guidance of the manufacturer. Unused equipment is stored on site in a location away from potential contamination. Maintenance, when appropriate, is performed by employees skilled in performing that task.

8.0 EXPOSURE MONITORING PROGRAM

This Section of the HASP describes how levels of hazardous substances and physical hazards, and worker exposures to them, are monitored at this site. This exposure monitoring program provides project-specific information about:

* monitoring procedures to detect the presence of hazardous substances
* monitoring procedures to determine worker exposures to hazardous substances and physical hazards

* action levels and required responses for known and expected hazardous substances and physical hazards
* calibration and maintenance procedures for monitoring equipment

James M. Trainer is responsible for implementing this exposure monitoring program.

The following personnel are qualified to use and interpret direct-reading air monitoring instruments

Names	Types of direct-reading instruments used
James M. Trainer, Scott Clary, Brian Spangler	4 Gas plus PID, PID, TSI Dust Trak and TSI Side Pak

The following personnel are qualified to conduct air sampling:

James M. Trainer

Brian Spangler

Scott Clary

8.1 Air Monitoring

Air sample collection and analysis is used to determine the level of employee exposure to potential or known contaminants identified by the Remedial Investigation Feasibility Study conducted previously by representatives of the NYSDEC. Consistent with HAZWOPER, personal air samples are collected in the breathing zones of employees expected to have the highest exposure during the task being evaluated. Two types of air monitoring will be conducted during this project; "high risk" worker monitoring and perimeter monitoring.

Documentation Monitoring

Documentation air monitoring will be completed. Accordingly, four air samples (one upwind and three downwind) will be collected around the perimeter of the work area on a daily basis using air sampling pumps connected to a filter cassette. One set of these daily samples per week will be selected for analysis for total nuisance dust by the project engineer. Samples will be collected and analyzed in accordance with the National Institute for Occupational Safety and Health's (NIOSH) reference method 0500. In addition to perimeter documentation monitoring, personnel documentation samples for organo-chlorine pesticides, metals, and particulate will be collected from the breathing zones of two workers once a week. Personnel documentation samples will be collected and analyzed in accordance with EPA method 10A, NIOSH reference methods 7300 and 0500, respectively.

Periodic Monitoring

Table 8-1a summarizes the type and frequency of periodic air sample collection and analysis during this project. Table 8-1a also identifies exposure limits for

data interpretation and the appropriate actions when airborne concentrations exceed these values.

Periodic monitoring for total dust, VOC, % LEL and O_2 using real time instrumentation (Side Pak dust monitor, BW Technologies 4 Gas / PID Meter) will be conducted in the breathing zone of representative employees while employees are in the Exclusion Zone. Should potential exceedances of OSHA exposure limits be detected, the SO will be informed and back-up extractive air samples will be collected and analyzed to determine actual employee exposures.

Action limits identified are based on applicable occupational exposure limits. With respect to real time instruments the required action for total VOC was set at 5 parts per million (5 ppm) above background levels because the real time instruments are based on total VOC levels and the level of each contaminant is a percentage of the total VOC. Similarly, action levels for particulates (150 ug/m^3), % LEL (10 %) and O_2 (Less than 19.5 %) were set.

Laboratory-analyzed sample results are used to evaluate the accuracy of direct-reading monitoring data as well as to quantify worker exposures and to determine the effectiveness of the exposure controls used at this facility. Laboratory results are compared with the direct-reading data to ensure that direct-reading instruments can be used to predict instances when exposures exceed defined exposure limits and the margin by which these values were exceeded.

Table 8-1a Periodic Monitoring: Air Sample Collection and Analysis							
Task	**Substance**	**Location**	**Type**	**Method**	**Frequency**	**Exposure Limits**	**Action**
Fence Installation and removal	Dust	Breathing Zone	Real Time	Direct Reading	Hourly	>150 ug/m3 above background	Stop Work. Upgrade to Level C
	VOC	Breathing Zone	Real Time	Direct Reading	Hourly	5 ppm above background	Stop Work. Upgrade to Level C
	% LEL	Area	Real Time	Direct Reading	Hourly	> 10 %	Stop work until levels are lowered
	O2	Area	Real Time	Direct Reading	Hourly	< 19.5 %	Stop work ventilate
Clearing and Grubbing	Dust	Breathing Zone	Real Time	Direct Reading	Hourly	>150 ug/m3 above background	Stop Work. Upgrade to Level C
	VOC	Breathing Zone	Real Time	Direct Reading	Hourly	5 ppm above background	Stop Work. Upgrade to Level C
	% LEL	Area	Real Time	Direct Reading	Hourly	> 10 %	Stop work until levels are lowered
	O2	Area	Real Time	Direct Reading	Hourly	< 19.5 %	Stop work ventilate
Excavation	Dust	Breathing Zone	Real Time	Direct Reading	Hourly	>150 ug/m3 above background	Stop Work. Upgrade to Level C
	VOC	Breathing Zone	Real Time	Direct Reading	Hourly	5 ppm above background	Stop Work. Upgrade to Level C
	% LEL	Area	Real Time	Direct Reading	Hourly	> 10 %	Stop work until levels are lowered
	O2	Area	Real Time	Direct Reading	Hourly	< 19.5 %	Stop work ventilate

Table 8-1a Periodic Monitoring: Air Sample Collection and Analysis							
Soil Staging / Dewatering	Dust	Breathing Zone	Real Time	Direct Reading	Hourly	>150 ug/m3 above background	Stop Work. Upgrade to Level C
	VOC	Breathing Zone	Real Time	Direct Reading	Hourly	5 ppm above background	Stop Work. Upgrade to Level C
	% LEL	Area	Real Time	Direct Reading	Hourly	> 10 %	Stop work until levels are lowered
	O2	Area	Real Time	Direct Reading	Hourly	< 19.5 %	Stop work ventilate
Well Installation	Dust	Breathing Zone	Real Time	Direct Reading	Hourly	>150 ug/m3 above background	Stop Work. Upgrade to Level C
	VOC	Breathing Zone	Real Time	Direct Reading	Hourly	5 ppm above background	Stop Work. Upgrade to Level C
	% LEL	Area	Real Time	Direct Reading	Hourly	> 10 %	Stop work until levels are lowered
	O2	Area	Real Time	Direct Reading	Hourly	< 19.5 %	Stop work ventilate
DECON	Dust	Breathing Zone	Real Time	Direct Reading	Hourly	>150 ug/m3 above background	Stop Work. Upgrade to Level C
	VOC	Breathing Zone	Real Time	Direct Reading	Hourly	5 ppm above background	Stop Work. Upgrade to Level C
	% LEL	Area	Real Time	Direct Reading	Hourly	> 10 %	Stop work until levels are lowered
	O2	Area	Real Time	Direct Reading	Hourly	< 19.5 %	Stop work ventilate

Perimeter Monitoring

Table 8-1b summarizes the type and frequency of perimeter air sample collection and analysis during this project. Table 8-1b also identifies exposure limits for

data interpretation and the appropriate actions when airborne concentrations exceed these values.

Perimeter monitoring shall be conducted to protect the public in neighboring residential Areas. Continuous monitoring for total dust using real time instrumentation (TSI Dust Trak) and for organic vapors (Rae System – Multi-Rae) will be conducted upwind of the site before the start of each shift each work day. During intrusive work, monitoring will be conducted at one upwind and three downwind locations. Departures from the general background will be reported to the SO to determine if operations should continue. When appropriate, additional controls will be implemented to reduce contaminant concentrations at perimeter of the worksite. Should potential exceedances of DEC guidance limits be detected, the SO will be informed and back-up extractive air samples will be collected and analyzed to determine actual environmental exposures.

Table 8-1b Perimeter Air Monitoring Collection and Analysis

Task	Location	Frequency	Substance	Type	Action Level	Action
Fence Installation and removal	Downwind – site perimeter	During drilling	Dust	Direct Reading / Visual Observation	150 ug/m3 above background or visible dust	Stop Work. Reduce dust generation
	Downwind – site perimeter	During drilling	VOC	Direct Reading	5 PPM above background	Stop Work mitigate
Excavation	Downwind – site perimeter	During drilling	Dust	Direct Reading / Visual Observation	150 ug/m3 above background or visible dust	Stop Work. Reduce dust generation
	Downwind – site perimeter	During drilling	VOC	Direct Reading	5 PPM above background	Stop Work mitigate
Soil Staging/ Dewatering	Downwind – site perimeter	During drilling	Dust	Direct Reading / Visual Observation	150 ug/m3 above background or visible dust	Stop Work. Reduce dust generation
	Downwind – site perimeter	During drilling	VOC	Direct Reading	5 PPM above background	Stop Work mitigate
Well Installation	Downwind – site perimeter	During drilling	Dust	Direct Reading / Visual Observation	150 ug/m3 above background or visible dust	Stop Work. Reduce dust generation
	Downwind – site perimeter	During drilling	VOC	Direct Reading	5 PPM above background	Stop Work mitigate

James M. Trainer is responsible for determining an alternative monitoring strategy. If the monitoring strategy must be modified, the HASP will be revised accordingly and affected employees will be briefed about this change on the following day.

8.2 Equipment Calibration and Maintenance

Table 8-1c lists the specific monitoring instruments and the calibration procedures used on this facility. Instruments are calibrated and maintained according to the manufacturers' recommendations.

Table 8-1c Equipment Calibration & Maintenance				
Instrument / Serial Number	**Hazard(s) Measured**	**Field Calibration Method**	**Field Calibration Frequency**	**Manufacturer Re-calibration Date**
PID/4 Gas Meter	Organic Vapors	Challenge with known contaminant concentrations	Daily	When daily calibration fail.
Dust Trak / Side Pak	Total Dust	Zero Filter	Daily	Annually

8.3 Sample Management

Standard Operating Practices and in the sampling methods identified in Table 8-1a. Samples are shipped to and analyzed by the laboratories listed in Table 8-1d below:

Table 8-1d Laboratory Information	
Air Sample Analytes	**Laboratory Information**
Pesticides, Metals, Dust	Laboratory Name: Galson Laboratories Address: 6601 Kirkville Rd, East Syracuse, NY 13057 Telephone:315 – 432-5227

Laboratory results are available within 14 days of sample receipt at the laboratory.

Scott Clary reviews the analytical results and communicates the information to the Project Manager.

9.0 SPILL CONTAINMENT PROGRAM

9.1 Results of Evaluation for Potential Spills

Appropriate spill kits will be available during all equipment fueling operations. Absorbent pads will be placed beneath the fuel nozzle during fueling operations. All fuel brought on-site will be contained in a DOT approved truck mounted tank, outfitted with electric fueling nozzle and automatic shutoff. Equipment refueling will be done outside the area of excavation.

All hydraulic and fluid lines will be inspected daily. In case of line break, a spill kit stored on each piece of equipment, will be used to contain the spill. The spilled material and contaminated soil will be placed in DOT approved drums for off-site

disposal.

In the event of a release the following procedure will be followed:

1. Notify the SO immediately.
2. If necessary, evacuate immediate area of release.
3. The SO will conduct air monitoring and determine need for PPE.
4. Call CHEMTREC (800) 424-9300 for clean-up procedures and PPE if unknown.
5. Don appropriate PPE and prepare to implement spill control / remediation.

10.0 DECONTAMINATION

The decontamination Section of the HASP describes how personnel and equipment are decontaminated when they leave the Exclusion Zone. This Section also describes how residual waste from decontamination processes is disposed.

Emergency decontamination procedures are detailed in the Emergency Response Section of this HASP.

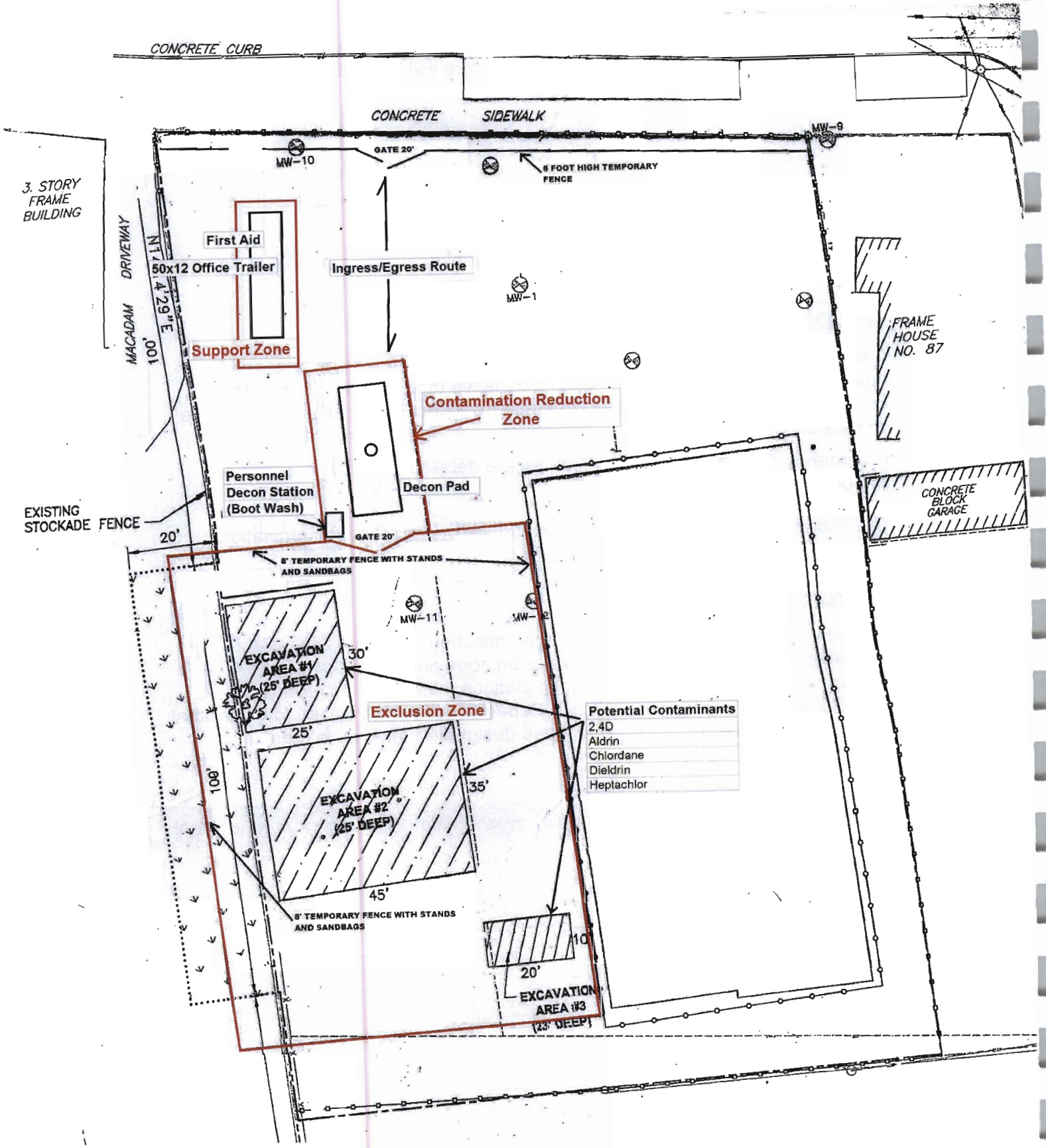
The Project Manager overseas implementation of project decontamination procedures and is responsible for ensuring their effectiveness.

10.1 Decontamination Facilities

Decontamination is conducted in the contamination reduction zone (CRZ). The CRZ acts as a buffer between the exclusion zone and the support zone. The location and design of decontamination stations minimize the spread of contamination beyond these stations. Separate facilities are used for personnel and for equipment. The location of these designated facilities is marked on Figure 10-1.

Figure 10-1 Location of Decontamination Facilities (following page)

Figure 10-1 Location of Decon Facilities



10.2 Decontamination Procedures for Personnel and PPE

Project-specific procedures for personnel and PPE decontamination minimize the potential for hazardous skin or inhalation exposure, cross-contamination, and chemical incompatibilities.

The following are general decontamination procedures established and implemented during this project.

* Decontamination is required for all workers exiting a contaminated area.
* Personnel may re-enter the Support Zone only after undergoing the decontamination procedures described in the next section.
* A personnel hygiene facility is located in the Support Zone.
* Used protective clothing is decontaminated, cleaned, maintained and/or replaced as needed to ensure its effectiveness.
* PPE is decontaminated or prepared for disposal on the premises. Personnel who handle contaminated equipment have been trained in the proper means to do so to avoid hazardous exposure.
* Workers are required and trained to immediately exit the work zone, perform applicable decontamination procedures, shower in the personnel hygiene facility, and change into uncontaminated clothing if their permeable clothing is splashed or becomes wetted with a hazardous substance.
* Procedures for disposal of decontamination waste meet applicable local, State, and Federal regulations.

10.3 Decontamination Procedures for Equipment

All equipment and machinery from the Exclusion Zone or CRZ are decontaminated in the CRZ prior to removal to the Support Zone. Equipment decontamination procedures are designed to minimize the potential for cross-contamination.

The following are general equipment decontamination procedures established and implemented during this project.

<u>General Equipment Decontamination Procedures:</u>

* Equipment in the Exclusion Zone that can be used again, that is still operable, and that will not pose an increased exposure hazard during re-use is left in Exclusion Zone until it is no longer needed. This eliminates unnecessary decontamination and reduces the potential for physical

transfer of contaminants outside the Exclusion Zone.

* Decontamination is required for all equipment exiting a contaminated area. Equipment may re-enter the Support Zone only after undergoing the equipment decontamination procedures.
* Equipment that cannot be successfully decontaminated is disposed of as hazardous waste.

Equipment Decontamination Certification:

Horizon hereby Certifies that all vehicles and equipment shall be free of contamination prior to entering the site.

In addition, the 93 Main Street log of vehicles (trucks) will be submitted to the Engineer at the end of each day. The log contains the following certification for each vehicle:

(A) No soil or other material is adhering to the vehicle body, tires or undercarriage. (B) The vehicle is not leaking or dripping liquids. (C) The contents of the vehicle are covered or completely enclosed so as not to permit potentially fugitive particulate matter to become airborne.

11.0 EMERGENCY RESPONSE PLAN

This Section of the HASP describes potential emergencies at this site, procedures for responding to those emergencies, roles and responsibilities during emergency response, and training that workers must receive in order to follow emergency procedures. This Section also describes the provisions this site has made to coordinate its emergency response planning with other contractors on site and with off-site emergency response organizations.

This emergency response plan provides the following site-specific information:

* pre-emergency planning
* on-site emergency response equipment and PPE
* emergency maps: evacuation routes and route to nearest hospital
* emergency roles and responsibilities
* emergency alerting and evacuation procedures

* emergency response procedures
* emergency decontamination, medical treatment and first aid
* response critique and plan updates
* emergency response training

11.1 Pre-emergency Planning

This site has been evaluated for potential emergency occurrences, based on site hazards and the tasks within the work plan. The results of that evaluation are shown in Table 11-1 below.

Task	Emergency
Site preparation	Injury by flying objects
Site preparation	Cut by chainsaw
Building Demolition	Fall from height
Building Demolition	Collapse of building
Mechanical Excavation	Collapse of trench
Install monitoring wells	Lightning strike
Install monitoring wells	Drill rig rollover
Install underground piping	Collapse of trench

11.2 On-Site Emergency Response Equipment

Emergency procedures may require specialized equipment to facilitate worker rescue, contamination control and reduction, or post-emergency clean-up. Emergency response equipment stocked on this site is listed in Table 11-2. This equipment inventory is designed to meet on-site emergency response needs and any specialized equipment needs that off-site responders might require because of the hazards at this site.

During an emergency, the Emergency Response Coordinator, Brian Spangler, is responsible for specifying the level of PPE required for emergency response. At a minimum, personal protective equipment used by emergency responders will comply with Section 7, Personal Protective Equipment, of this HASP.

Emergency response equipment is maintained in good working order. The equipment inventory is replenished as necessary to maintain response capabilities.

Table 11-2 Emergency Equipment & Emergency PPE		
Emergency Equipment and PPE		
Specific Type	**Quantity**	**Location Stored**
Disposable Coveralls	2	Emergency Equipment box in Office Trailer
Gloves	2	Emergency Equipment box in Office Trailer
Safety Glasses	2	Emergency Equipment box in Office Trailer
Respirators and cartridges	2	Emergency Equipment box in Office Trailer
Latex boot covers	2	Emergency Equipment box in Office Trailer
Hard Hats	2	Emergency Equipment box in Office Trailer
First Aid Kit	1	Emergency Equipment box in Office Trailer
First Aid Kit	1	Specific work location
Fire Extinguisher	1	Office Trailer
Fire Extinguisher	1	Specific work location

11.3 Emergency Planning Maps

Figure 11-3 indicates the route to the nearest emergency medical assistance and is posted at the office trailer.

Figure 11-3 Driving Route to Nearest Hospital

The nearest hospital to the site is the Lourdes Hospital. The hospital is 1.4 miles away from the site and it takes approximately 4 minutes by motor vehicle.

- Start out going EAST on MAIN STREET toward CHAPIN ST . 0.1 miles
- Turn RIGHT onto CHAPIN ST. 0.5 miles
- Turn RIGHT onto RIVERSIDE DR . 0.6 miles
- Turn LEFT onto hospital access road . 0.1 miles
- Arrive at 169 RIVERSIDE DR 0.0 miles

The hospital is located at 169 Riverside Drive, Binghamton, NY 13905
Phone Number: (607) 798-5231.

Figure 11-3 Hospital Route

11.4 Roles and Responsibilities for On-Site and Off-Site Personnel

Brian Spangler has been designated the Emergency Response Coordinator. He is responsible for implementing the emergency response plan and coordinates emergency response activities on this site.

In the event of an emergency, site personnel are evacuated and do not participate in emergency response activities. The on-site personnel and their alternates responsible for coordinating site evacuation efforts are listed in Table 11-4. The Emergency Response Coordinator or one of his/her alternates is on site whenever work operations are underway.

This site relies upon the off-site emergency response organizations listed in Table 11-4, Emergency Contact Information, to respond to site emergencies. These organizations have been provided a copy of this HASP; have been thoroughly briefed on site operations, hazards, and

potential emergencies and are appropriately trained, staffed, and equipped to provide emergency response to this site.

Table 11-4 Emergency Contact Information			
SITE PERSONNEL			
Title	**Contact**		**Telephone**
Project Manager	**Brian Spangler**		**412-303-8692**
Health and Safety Officer	**Scott Clary**		**724-612-4237**
Demolition Contractor			
Emergency Response Coordinator	*Brian Spangler*		*412-303-8692*
OUTSIDE ASSISTANCE	**Contact**	**Location**	**Telephone**
Fire Department			911
Police Department			911
Ambulance/EMS			911
Hospital Emergency Care		Lourdes Hospital	607-798-5231
Poison Control Center			800-222-1222
NYSDEC	*Work hours*	*Syracuse*	315-426-7400
NYSDEC	*After Hours*		
NYSDEC Spill Reporting			800-457-7362
Federal Spill Reporting			800-424-8802
Broome County Dept of Health			607-778-3930
NYS Dept of Health			866-881-2809
Chemical Emergency Advice (CHEMTREC)			800-424-9300

11.5 Emergency Response

When the Emergency Response Coordinator is notified that emergency assistance is required, the applicable off-site organization shown in Table 11-4 is contacted. The Emergency Response Coordinator (or designee) provides relevant information to the responding organizations, including hazards associated with the emergency incident, potential containment problems, and missing site personnel.

11.6 Emergency Decontamination, Medical Treatment and First Aid

Because of the near proximity of medical assistance, this site does not train or assign site personnel to provide first aid.

The primary medical care facility for this site is Lourdes Hospital, 169 Riverside Drive, Binghamton, NY 13905. The route to the facility is shown in Figure 11-3.

Site personnel who are contaminated and need medical treatment will be decontaminated before being transported to a medical facility **if** decontamination does not delay life-saving treatment or aggravate the injury.

When emergency decontamination is performed, contaminated protective clothing and equipment is washed, rinsed and/or cut off.

11.7 Community Protection Plan

11.7.1 Introduction

This Community Protection Plan (CPP) outlines the steps to be implemented to protect the health and safety of surrounding human population and the environment.

11.7.2 Air Monitoring

11.7.2.1 As part of the Air Monitoring Program, real-time monitoring and documentation sampling as described in the Subpart "Air Monitoring Program" of this section will be used to determine if off-site emissions, as a result of site work, pose a threat to the surrounding community.

11.7.2.2 Real-time air monitoring for volatile compounds and particulate levels at the perimeter of the work area will be provided continuously.

11.7.2.3 Volatile organic compounds will be monitored at the downwind perimeter of the work area on a continuous basis using a Multi-Rae PID. If total organic vapor levels exceed 5 ppm above background, work activities shall be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. All readings shall be recorded and be available for State (DEC & DOH) personnel to review.

11.7.2.4 Particulates in the range of PM10 shall be continuously monitored at 3 documentation sampling stations using a TSi Dusttrak at each station. If the downwind particulate level is 150 ug/m^3 greater than the upwind particulate level, dust suppression techniques shall be employed. All readings shall be recorded and be available for State (DEC & DOH) personnel to review.

11.7.3 Vapor Emission Response Plan

11.7.3.1 If the ambient air concentrations of organic vapors exceed 5 ppm above background at the perimeter of the work area, activities shall be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities may resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities may resume provided the organic vapor level 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

11.7.3.2 If the organic vapor level is above 25 ppm at the perimeter of the work area, activities shall be shutdown. When work shutdown occurs, downwind air monitoring as directed by the HST shall be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

11.7.4 Major Vapor Emission

11.7.4.1 If organic vapor levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities shall be halted.

11.7.4.2 If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, the air quality shall be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

11.7.4.3 If efforts to abate the emission source are unsuccessful and if organic vapor levels are approaching 5 ppm above background and persist for more than 30 minutes in the 20 Foot Zone, the Major Vapor Emission Response Plan shall automatically be placed into effect.

11.7.4.4 However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background levels.

11.7.5 Major Vapor Emission Response Plan

Upon activation, the following shall be undertaken:

11.7.5.1 All Emergency Response Contacts shall be contacted.

11.7.5.2 The local police authorities shall immediately be contacted by the HST and advised of the situation. The HST will coordinate with local officials to arrange for notification and evacuation of the surrounding community.

11.7.5.3 Air monitoring shall be conducted at 30 minutes intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring say be halted or modified by the HST.

11.7.5.4 The Air Monitoring Program shall include real-time air monitoring and shall be conducted at the perimeter of the site. Particulates should be continuously monitored upwind and downwind during intrusive

activities at temporary particulate monitoring stations. Particulate concentrations within the Exclusion Zone shall be monitored periodically (see Section 7.1 above). If the downwind particulate level is more than 2.5 times greater than the upwind particulate level and greater than 150 ug/m^3, then dust suppression techniques shall be employed. This is a general action level. All readings shall be recorded and be available for NYSDEC, and NYSDOH personnel to review.

11.7.5.5 Coordinate with local officials to arrange for notification and evacuation of the surrounding community in the event that off-site emissions pose a threat.

11.8 Recordkeeping and Daily Log Contents

The training records will be maintained and retained onsite in the Office Trailer. The Project Manager and the HST will establish a system appropriate to the site that will maintain, at a minimum, the following records and information.

1. Personnel conducting the site activities, their arrival and departure times, and their destination at the site

2. Incidents and unusual activities that occur on the site such as, but not limited to, accidents, breaches of security, injuries, equipment failures, and weather related problems

3. Changes to the SOW and the HASP

4. Daily information such as:

   - Work accomplished and the current site status
   - Air monitoring equipment calibrations, repairs, and results. Results will be signed by the HSC and provided to the engineer on a daily basis.
   - Site work zones.
   - Sign in / out logs
   - Safety Talks

5. Records of HAZWOPER and other applicable site specific training.

Table 2.2a: Job Hazard Analysis			
JHA Number: 1	**Task/Operation** Site Preparation	**Location Where Task/Operation Performed** 93 Main StreetSite	
Chemical Hazards			
Chemical Hazard	**Source**	**Concentration**	**Exposure Potential**

Table 2.2a: Job Hazard Analysis			
Silica Nuisance Dust	Concrete	Low	☒ Low ☐ Moderate ☐ High
Biological Hazards			
Biological Hazard	**Source**	**Concentration**	**Exposure Potential**
Poison Ivy	Plant	Low	☒ Low ☐ Moderate ☐ High
Biting insects	Air	Low	☒ Low ☐ Moderate ☐ High
Physical Hazards			
Name of Physical Hazard	**Source**		**Exposure Potential**
Noise in excess of 85 dBA Flying particles	Drilling Concrete		☒ Low ☐ Moderate ☐ High
Flying concrete chips Crushing, Pinching, Dropping	Hammer Drill Cutter		☒ Low ☐ Moderate ☐ High
Control Measures Used			
Engineering Controls:			
Work Practices: No one approaches cutting or chipping operation without eye-to-eye contact with operator, Wet materials prior to cutting Good personal hygiene			
PPE: Level D Hearing protection, full face shield, safety glasses under face shield, long sleeve shirt and full length pants Chainsaw chaps are worn on lower legs and forearms during cutting operations			

Table 2.2b: Job Hazard Analysis

JHA Number:	Task/Operation	Location Where Task/Operation Performed
2	Demolish Existing Building	93 Main StreetSite

Chemical Hazards

Chemical Hazard	Source	Concentration	Exposure Potential
VOC SVOC and Herbicides/Pesticides	Soils, Groundwater	Low to moderate	☐ Low ☒ Moderate ☐ High
VOC SVOC and Herbicides/Pesticides	Soils around building	Low	☐ Low ☒ Moderate ☐ High
Asbestos containing materials	Floor tile	Low	☐ Low ☒ Moderate ☐ High
Dust, Silica	Soils Building Structure	Low	☐ Low ☒ Moderate ☐ High

Biological Hazards

Biological Hazard	Source	Concentration	Exposure Potential
N/A	N/A	N/A	N/A

Physical Hazards

Name of Physical Hazard	Source	Exposure Potential
Crushing, Pinching, Dropping	Excavator, Dozer, Skidsteer, Roller	☒ Low ☐ Moderate ☐ High
Fall	Open floor and other holes	☒ Low ☐ Moderate ☐ High
Overhead hazards	Demolished walls, floors and ceilings	☒ Low ☐ Moderate ☐ High
Soil / water in eyes	Soils and water	☒ Low ☐ Moderate ☐ High

Control Measures Used

Engineering Controls:

Enclosed air conditioned cabs

Equipment is designed with good visibility

Remote demolition operations

Asbestos will be removed by a NYS DOL licensed contractor under provisions of NYS Code Rule 56

All utilities to be contacted, their services cut-off and disconnected prior to demolition activities

Work Practices: No one approaches machinery without eye-to-eye contact with operator, Dust suppression using water mist when necessary Barricades, fencing, caution tape, or danger signs for open pits Good personal hygiene No eating, drinking or smoking in work areas Workers use caution to avoid dust / water in the eyes No one walks or climbs over piles of demolition debris. Walks excavator to edge of debris for routine egress into walkways clear of debris and trip and fall hazzards. Gates to be constructed into site to provide easy truck access without crossing traffic on Niagara Street Spotter will be used to guide all trucks on site.
PPE: Modified Level C or Level D Level C for asbestos removal Emergency eyewash solution is readily available in the event of exposure

Table 2.2c: Job Hazard Analysis		
JHA Number: 3	**Task/Operation** Mechanical Excavation of Soils	**Location Where Task/Operation Performed** 93 Main StreetSite

Chemical Hazards			
Chemical Hazard	**Source**	**Concentration**	**Exposure Potential**
VOC SVOC and Herbicides/Pesticides	Soils, Groundwater	Low	☐ Low ☒ Moderate ☐ High
VOC SVOC and Herbicides/Pesticides	Soils around building	Moderate	☐ Low ☒ Moderate ☐ High
Dust	Soils	Low	☐ Low ☒ Moderate ☐ High

Biological Hazards			
Biological Hazard	**Source**	Concentration	**Exposure Potential**
N/A	N/A	N/A	N/A

Physical Hazards		
Name of Physical Hazard	**Source**	**Exposure Potential**
Crushing, Pinching, Dropping	Excavator, Dozer, Skidsteer, Roller	☒ Low ☐ Moderate ☐ High
Fall	Open Pits	☒ Low ☐ Moderate ☐ High

Control Measures Used

Engineering Controls:
Enclosed air conditioned cabs
Remote handling of soil
Equipment is designed with good visibility

Work Practices:
Air monitoring with PID in vehicle cab
No one approaches machinery without eye-to-eye contact with operator,
Dust suppression using water mist when necessary
Barricades, fencing, caution tape, or danger signs for open pits
Good personal hygiene
No eating, drinking or smoking in contaminated areas
Horizon will slope excavation walls to the extent permissible under 29 CFR 1926 (up to a maximum of fifty one degrees). However, no personnel will be permitted to enter excavation areas.

PPE:
Modified Level C or Level D

Table 2.2d: Job Hazard Analysis

JHA Number:	Task/Operation	Location Where Task/Operation Performed
4	Loading Trucks	93 Main StreetSite

Chemical Hazards

Chemical Hazard	Source	Concentration	Exposure Potential
VOC SVOC and Herbicides/Pesticides	Soils, Water	Low	☒ Low ☐ Moderate ☐ High
VOC SVOC and Herbicides/Pesticides	Soils around building	Low	☒ Low ☒ Moderate ☐ High
Dust	Soils	Low	☐ Low ☒ Moderate ☐ High

Biological Hazards

Biological Hazard	Source	Concentration	Exposure Potential
N/A	N/A	N/A	N/A

Physical Hazards

Name of Physical Hazard	Source	Exposure Potential
Crushing, Pinching, Dropping	Excavator, Front End Loader, Trucks	☒ Low ☐ Moderate ☐ High

Control Measures Used

Engineering Controls:
Enclosed air conditioned cabs
Equipment is designed with good visibility
Back-up horns

Work Practices:
No one approaches machinery without eye-to-eye contact with operator,
Dust suppression using water mist when necessary
Good personal hygiene
No eating, drinking or smoking in contaminated areas
Poly (6 mil) will used to prevent spreading of contaminants while loading trucks.
Inspect all trucks daily for properly operating back-up horns

PPE:
Modified Level C or Level D

Table 2.2e: Job Hazard Analysis		
JHA Number: 5	**Task/Operation** Equipment Decontamination	**Location Where Task/Operation Performed** 93 Main StreetSite

Chemical Hazards

Chemical Hazard	Source	Concentration	Exposure Potential
VOC SVOC and Herbicides/Pesticides	Soils, Water	Low	☒ Low ☐ Moderate ☐ High
VOC SVOC and Herbicides/Pesticides	Soils around building	Low	☐ Low ☒ Moderate ☐ High
Dust	Soils	Low	☐ Low ☒ Moderate ☐ High

Biological Hazards

Biological Hazard	Source	Concentration	Exposure Potential
N/A	N/A	N/A	N/A

Physical Hazards

Name of Physical Hazard	Source	Exposure Potential
Crushing, Pinching, Dropping	Excavator, Front End Loader, Trucks	☒ Low ☐ Moderate ☐ High
Soil / water in eyes	Soils and water	☒ Low ☐ Moderate ☐ High

Control Measures Used

Engineering Controls:
Power washer has an automatic wand shut-off if released from hand

Work Practices:
Workers use caution to avoid soil/water in the eyes
Decontamination will be by power washer, do not spray power washer at body parts

PPE:
Modified Level C or Level D with face shield
Emergency eyewash solution is readily available in the event of exposure

Table 2.2f: Job Hazard Analysis		
JHA Number: 6	**Task/Operation** Backfilling Excavation with clean fill	**Location Where Task/Operation Performed** 93 Main StreetSite

Chemical Hazards			
Chemical Hazard	**Source**	**Concentration**	**Exposure Potential**
N/A			

Biological Hazards			
Biological Hazard	**Source**	**Concentration**	**Exposure Potential**
N/A	N/A	N/A	N/A

Physical Hazards		
Name of Physical Hazard	**Source**	**Exposure Potential**
Crushing, Pinching, Dropping	Excavator, Front End Loader, Trucks	☒ Low ☐ Moderate ☐ High
Soil / water in eyes	Soils and water	☒ Low ☐ Moderate ☐ High

Control Measures Used

Engineering Controls:
Back-up horns

Work Practices:
Workers use caution to avoid soil / water in the eyes
Inspect all trucks daily for properly operating back-up horns

PPE:
Level D
Emergency eyewash solution is readily available in the event of exposure

Table 2.2g: Job Hazard Analysis

JHA Number:	Task/Operation	Location Where Task/Operation Performed
7	Install Monitoring Wells	93 Main StreetSite

Chemical Hazards

Chemical Hazard	Source	Concentration	Exposure Potential
VOC SVOC and Herbicides/Pesticides	Soils, Water	Low	☒ Low ☐ Moderate ☐ High
VOC SVOC and Herbicides/Pesticides	Soils around building	Low	☐ Low ☒ Moderate ☐ High
Dust	Soils	Low	☐ Low ☒ Moderate ☐ High

Biological Hazards

Biological Hazard	Source	Concentration	Exposure Potential
N/A	N/A	N/A	N/A

Physical Hazards

Name of Physical Hazard	Source	Exposure Potential
Noise in excess of 85 dBA	Drill Equipment	☐ Low ☒ Moderate ☐ High
Soil/water in eyes and on hands and body	Soils and water	☒ Low ☐ Moderate ☐ High

Control Measures Used

Engineering Controls:
N/A

Work Practices:
Workers use caution to avoid soil/water in the eyes and skin contact
Barricades, fencing, caution tape, or danger signs

PPE:
Hearing Protection
Modified Level C or Level D with face shield
Emergency eyewash solution is readily available in the event of exposure

Table 2.2h: Job Hazard Analysis

JHA Number:	Task/Operation	Location Where Task/Operation Performed
8	Install Underground Piping	93 Main StreetSite

Chemical Hazards

Chemical Hazard	Source	Concentration	Exposure Potential
VOC SVOC and Herbicides/Pesticides	Soils, Water	Low	☒ Low ☐ Moderate ☐ High
VOC SVOC and Herbicides/Pesticides	Soils around building	Low	☒ Low ☐ Moderate ☐ High
Dust	Soils	Low	☐ Low ☒ Moderate ☐ High

Biological Hazards

Biological Hazard	Source	Concentration	Exposure Potential
N/A	N/A	N/A	N/A

Physical Hazards

Name of Physical Hazard	Source	Exposure Potential
Crushing, Pinching, Dropping	Excavator, Dozer, Skidsteer, Roller	☒ Low ☐ Moderate ☐ High
Fall	Open trenches	☒ Low ☐ Moderate ☐ High
Soil/water in eyes	Soils and water	☒ Low ☐ Moderate ☐ High

Control Measures Used

Engineering Controls:
Enclosed air conditioned cabs
Equipment is designed with good visibility
Trench boxes or approved sloped sides

Work Practices:
No one approaches machinery without eye-to-eye contact with operator,
Dust suppression using water mist when necessary
Barricades, fencing, caution tape, or danger signs for open trenches
Good personal hygiene
No eating, drinking or smoking in work areas

PPE:
Modified Level C or Level D with face shield
Emergency eyewash solution is readily available in the event of exposure

Table 2.2i: Job Hazard Analysis

JHA Number:	Task/Operation	Location Where Task/Operation Performed
9	Construct Treatment Building	93 Main StreetSite

Chemical Hazards

Chemical Hazard	Source	Concentration	Exposure Potential
VOC SVOC and Herbicides/Pesticides	Soils, Water	Low	☒ Low ☐ Moderate ☐ High
VOC SVOC and Herbicides/Pesticides	Soils around building	Low	☒ Low ☐ Moderate ☐ High
Dust/Silica	Soils, Concrete	Low	☐ Low ☒ Moderate ☐ High

Biological Hazards

Biological Hazard	Source	Concentration	Exposure Potential
N/A	N/A	N/A	N/A

Physical Hazards

Name of Physical Hazard	Source	Exposure Potential
Fall	Work from heights (eg scaffold)	☒ Low ☐ Moderate ☐ High
Electrical shock	Work with energized equipment Buried utilities	☒ Low ☐ Moderate ☐ High
Crushing, Pinching, Dropping	Excavator, Dozer, Skidsteer, Roller	☒ Low ☐ Moderate ☐ High
Noise in excess of 85 dBA	Construction Equipment	☐ Low ☒ Moderate ☐ High
Soil/water in eyes	Soils and water	☒ Low ☐ Moderate ☐ High

Control Measures Used

Engineering Controls:
Scaffolds with side rails and toeboards
All powered equipment run through GFI
Enclosed air conditioned cabs
Equipment is designed with good visibility

Work Practices: Call UFPO before digging 100 % fall protection above 5 feet. No one approaches machinery without eye-to-eye contact with operator, Good personal hygiene No eating, drinking or smoking in work areas
PPE: Level D with face shield Hearing Protection Emergency eyewash solution is readily available in the event of exposure

Table 2.2j: Job Hazard Analysis

JHA Number:	Task/Operation	Location Where Task/Operation Performed
10	Landscape Treatment Building	93 Main StreetSite

Chemical Hazards

Chemical Hazard	Source	Concentration	Exposure Potential
Dust and Chemicals in landscaping materials	Soil, materials	Low	☐ Low ☒ Moderate ☐ High
Dust	Soils	Low	☒ Low ☐ Moderate ☐ High

Biological Hazards

Biological Hazard	Source	Concentration	Exposure Potential
N/A	N/A	N/A	N/A

Physical Hazards

Name of Physical Hazard	Source	Exposure Potential
Soil/water in eyes	Soils and water	☒ Low ☐ Moderate ☐ High

Control Measures Used

Engineering Controls:
N/A

Work Practices:
Workers use caution to avoid soil / water in the eyes
Workers use caution to avoid landscaping chemicals on hands or in the eyes

PPE:
Level D
Emergency eyewash solution is readily available in the event of exposure

12.0 Material Data Safety Sheets

Safety data for dieldrin

Glossary of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: 4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a7,7a-octahydro-2,7:3,6-Dimethanonaphth[2,3-b]oxirene; 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-exo-1,4-endo-5,8-dimethanonaphthalene; 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-dimethanonaphth(2,3-b)oxirene, alvit, compound 497, dieldrix, diledrite, HEOD, illoxol, quintox, octalox, numerous further trade names, especially for mixtures containing dieldrin.
Molecular formula: $C_{12}H_8Cl_6O$
CAS No: 60-57-1
EC No:

Physical data

Appearance: white or light brown powder or crystals
Melting point: 176 C
Boiling point: 385 C
Vapour density:
Vapour pressure:
Specific gravity: 1.75
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility: slight

Stability

Stable. Breakdown product of aldrin in the environment. Incompatible with acids, active metals and strong oxidizing agents.

Toxicology

Toxic. May act as a mutagen. Harmful by ingestion or inhalation. Ingestion of large quantities may be fatal. May accumulate in the body. Toxic if absorbed through the skin. Possible risk of irreversible effects. Typical TWA 0.25 mg/m3.

Toxicity data

(The meaning of any abbreviations which appear in this section is given here.)

ORL-MAN LDLO 65 mg kg^{-1}
ORL-RAT LD50 38 mg kg^{-1}
IHL-RAT LC50 13 mg/m3/4h
SKN-RAT LD50 56 mg kg^{-1}
SCU-RAT LD50 49 mg kg^{-1}
IVN-RAT LD50 9 mg kg^{-1}
ORL-MKY LD50 3 mg kg^{-1}
ORL-BWD LD50 13 mg kg^{-1}

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)
R25 R27 R40 R48.

Transport information

Environmental information

Harmful to wildlife. Removed only slowly from the environment by natural processes.

Personal protection

Safety glasses, gloves, good ventilation.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)
S22 S36 S37 S45.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

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but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date.

Safety data for chlordane

Glossary of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindan, octachloro-4,7-methanohydroindane, aspon-chlordane, belt, gamma-chlordan, chlorindan, chlor kil, chlorodane, corodane, dichlorochlordene, dowchlor, kypchlor, niran, octachlor, synklor, tat chlor 4, topichlor, topichlor 20, toxichlor, starchlor, kilex lindane, termi-ded, further trade names
Use: organochlorine pesticide
Molecular formula: $C_{10}H_6Cl_8$
CAS No: 57-74-9
EINECS No:

Physical data

Appearance: off-white powder
Melting point: 106 - 107 C
Boiling point: ca. 175 C (decomposes)
Vapour density:
Vapour pressure:
Density (g cm^{-3}): ca. 1.6
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility:

Stability

Stable, but readily decomposed by moderately strong alkaline solutions. Corrodes iron and zinc and attacks some types of polymer. Incompatible with strong oxidizing agents.

Toxicology

Toxic if ingested. Harmful in contact with the skin or inhaled. May cause systemic effects. Experimental carcinogen, teratogen.

Toxicity data

(The meaning of any toxicological abbreviations which appear in this section is given here.)

ORL-RAT LD50 200 mg kg^{-1}

IHL-CAT LC50 100 mg m^{-3}/4h

IPR-MUS LD50 240 mg kg^{-1}

IVN-MUS LD50 10 mg kg^{-1}

ORL-RBT LD50 100 mg kg^{-1}

SKN-HMN LDLO 428 mg kg^{-1}

ORL-QAL LD50 83 mg kg^{-1}

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)
R20 R21 R25.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No 2761. Hazard class 6.1. Packing group III.

Personal protection

Safety glasses, gloves, adequate ventilation.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

Safety data for aldrin

Glossary of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: hexachlorohexahydro-endo-exo-dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene, aldrex, aldrite, aldrosol, drinox, HHDN, octalene, seedrin, octalene compound 118
Use: organochlorine pesticide
Molecular formula: $C_{12}H_8Cl_6$
CAS No: 309-00-2
EINECS No:

Physical data

Appearance: off-white solid
Melting point: 104 C
Boiling point: 145 C at 2 mm Hg
Vapour density:
Vapour pressure:
Density (g cm^{-3}): 1.7
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility: slight

Stability

Stable. Non-flammable. Incompatible with active metals, acid oxidizing agents,

acid catalysts.

Toxicology

Poison if ingested, inhaled or absorbed through the skin. May cause systemic effects. May cause reproductive harm. Experimental carcinogen and neoplastigen.

Toxicity data

(The meaning of any toxicological abbreviations which appear in this section is given here.)

ORL-HMN TDLO 14 mg kg^{-1}

ORL-RAT LD50 39 mg kg^{-1}

SKN-RAT LD50 98 mg kg^{-1}

SCU-RAT LD50 62 mg kg^{-1}

ORL-DOG LD50 65 mg kg^{-1}

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)
R23 R24 R25 R47.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No 2761. Hazard class 6.1. Packing group II.

Personal protection

Safety glasses, gloves, good ventilation.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

Safety data for 2,4-dichlorophenoxyacetic acid

Glossary of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: 2,4-D, 2,4-D acid, dichlorophenoxyacetic acid, 2,4-dichlorophenoxyethanoic acid, dichlorophenoxyethanoic acid, Agrotect, Amidox, Asgrow Aqua KD, Amoxone, Aqua-kleen, Chloroxone, Crop rider, formula 40, Decamine, Ed-weed, Dicopur, Dicotox, DMA-4, Dormone, Emulsamine BK, Envert DT, Ferminine, Lawn-keep, Miracle, Monosan, Netagrone, pannamine, Weedtox, Weedtrol, Verton, numerous further trade names
Use: herbicide, defoliant, weed killer, fruit drop controller. Component of Agent Orange.
Molecular formula: $Cl_2C_6H_3OCH_2COOH$
CAS No: 94-75-7
EINECS No: 202-361-1

Physical data

Appearance: light yellow crystalline powder
Melting point: 136 - 140 C

Boiling point: decomposes
Vapour density:
Vapour pressure:
Density (g cm^{-3}): 1.56
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility: decomposes

Stability

Stable, but moisture-sensitive and may be light-sensitive. Incompatible with strong oxidizing agents, corrodes many metals. Decomposes in water.

Toxicology

Toxic if swallowed or inhaled. Experimental carcinogen and teratogen. May be harmful by skin contact. May cause CNS damage. Eye, skin and respiratory irritant. NTP lethal dose 700 mg kg^{-1}; acceptable daily intake 0-0.3 mg kg^{-1}.

Toxicity data

(The meaning of any toxicological abbreviations which appear in this section is given here.)
ORL-HMN LDLO 80 mg kg^{-1}
ORL-RAT LD50 370 mg kg^{-1}
SKN-RAT LD50 1500 mg kg^{-1}
ORL-RBT LDLO 800 mg kg^{-1}
SKN-RBT LD50 1400 mg kg^{-1}

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)
R23 R24 R25 R36 R37 R38.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No 2765. Hazard class 6.1. Packing group II.

Personal protection

Safety glasses, rubber gloves. Ensure adequate ventilation.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)
S26 S37 S39.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

Safety data for heptachlor

Glossary of terms on this data sheet.

The information on this web page is provided to help you to work safely, but it is intended to be an overview of hazards, not a replacement for a full Material Safety Data Sheet (MSDS). MSDS forms can be downloaded from the web sites of many chemical suppliers.

General

Synonyms: 1,4,5,6,7,8,8-heptachloro-3A,4,7,7A-tetrahydro-4,7-methanoindene, 3,4,5,6,7,8,8A-heptachlorodicyclopentadiene, agroceres, drinox, GPKH, heptagran, hepta, heptachlorane, heptox, heptamul, rhodiachlor, velsicol heptachlor
Use: organochlorine pesticide (use restricted or no longer permitted in some countries)
Molecular formula: $C_{10}H_5Cl_7$
CAS No: 76-44-8
EINECS No: 200-962-3
Annex I Index No: 602-046-00-2

Physical data

Appearance: white crystalline solid
Melting point: 95 - 96 C
Boiling point: decomposes
Vapour density:
Vapour pressure:
Density (g cm^{-3}): 1.58
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility:

Stability

Stable. Non-combustible. Incompatible with strong alkali, oxidizing agents. Corrodes many metals.

Toxicology

Toxic if inhaled, swallowed or absorbed through the skin. Readily absorbed through the skin. Possible carcinogen. May cause systemic effects.

Toxicity data

(The meaning of any toxicological abbreviations which appear in this section is given here.)

ORL-RAT LD50 40 mg kg^{-1}

SKN-RAT LD50 119 mg kg^{-1}

IPR-RAT LD50 27 mg kg^{-1}

ORL-MUS LD50 68 mg kg^{-1}

IVN-MUS LD50 20 mg kg^{-1}

SKN-GPG LDLO 1000 mg kg^{-1}

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)
R24 R25 R33 R40 R50 R53.

Environmental information

Toxic in the environment - very harmful to aquatic systems. May cause long-term damage.

Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No 2761. Hazard class 6.1. Packing group II.

Personal protection

Safety glasses and gloves. Use only in a well-ventilated area.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)
S36 S37 S45 S60 S61.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

This information was last updated on October 4, 2005. We have tried to make it as accurate and useful as possible, but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date.

Appendix C

Monitoring Well Boring/Construction Logs

DRILLING SUMMARY

Geologist:
Brian Demme

Drilling Company:
Buffalo Drilling Company, Inc.

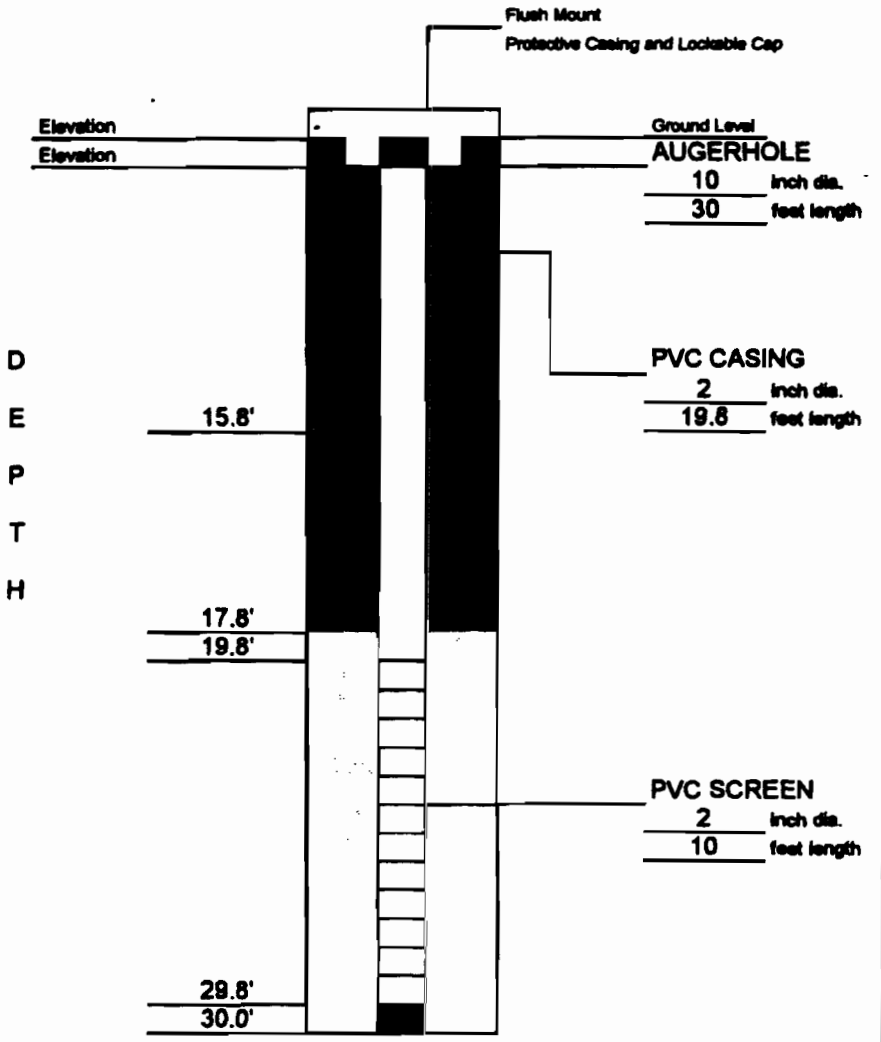
Driller:
Don Rimbeck

Rig Make/Model:
CME-55

Date:
November 20, 1998

GEOLOGIC LOG

Depth(ft.)	Description
0-0.4	Asphalt
0.4-5	Fill: C-F gravel and c-f sand, cinders, wood, cobbles and bricks
5-12	Fine-sand and c-f gravel, cobbles, sandstone fragments
12-24	Cobbles and c-f gravel, some c-f sand
24-30	C-F gravel with weathered shale



WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface: Steel grade box	Type: 2" PVC	Type: #2 Sand Setting: 19.8'-29.8'
Monitor: 2" PVC	Slot Size: 0.02	SEAL MATERIAL Type: Bentonite Setting: 15.8'-17.8'

COMMENTS:
Installed in asphalt parking area.

LEGEND

- Bottom cap
- J- Plug
- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: NYSDEC	Location: 93 Main Street Binghamton, NY	Project No.: 0535598.02
URS Greiner, Inc.	MONITORING WELL CONSTRUCTION DETAILS	Well Number: MW-1

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02/02/9

DRILLING SUMMARY

Geologist:
Brian Demme

Drilling Company:
Buffalo Drilling Company, Inc.

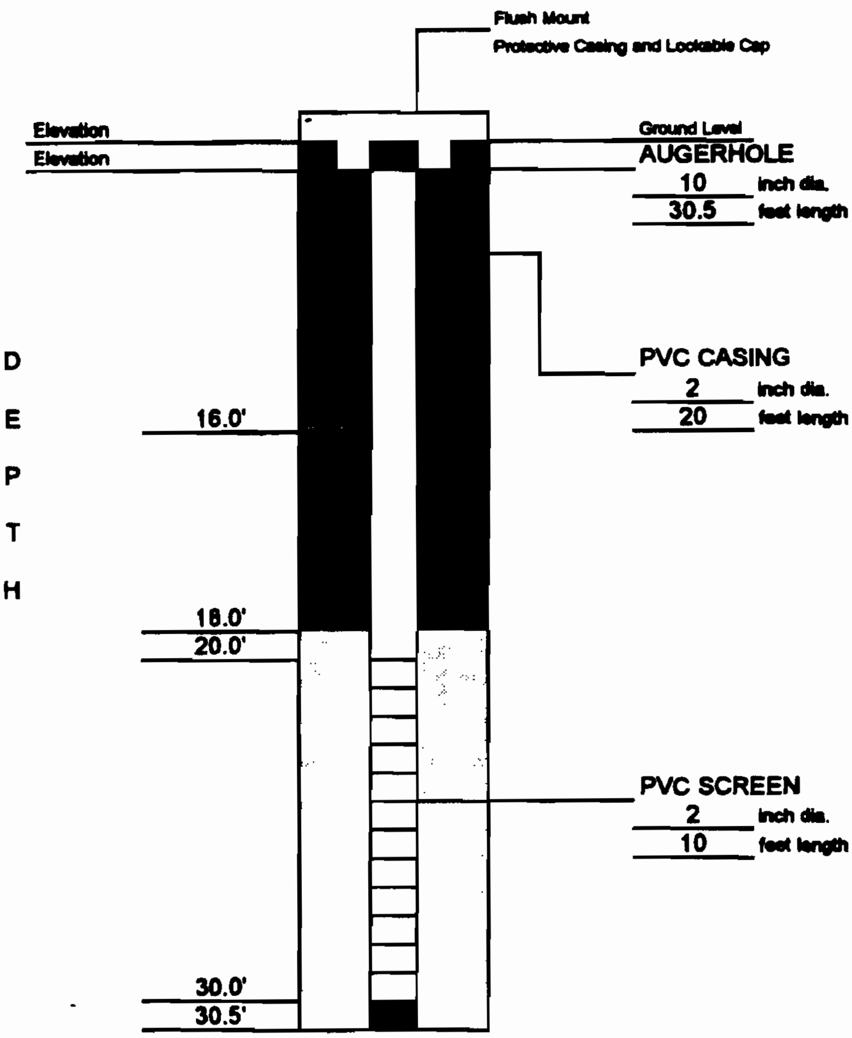
Driller:
Don Rimbeck

Rig Make/Model:
CME-55

Date:
November 18, 1998

GEOLOGIC LOG

Depth(ft.)	Description
0-0.4	Fill: Cinders, some organics, and ash
3-16	Silt, some c-f gravel, some to trace sand, cobbles
14-18	Boulders, cobbles, C-F gravel, trace silt
18-30.5	Silt (till) with some gravel boulders, cobbles.



WELL DESIGN

CASING MATERIAL		SCREEN MATERIAL		FILTER MATERIAL	
Surface:	Steel grade box	Type:	2" PVC	Type: #2 Sand	Setting: 20'-30'
				SEAL MATERIAL	
Monitor:	2" PVC	Slot Size:	0.02	Type: Bentonite	Setting: 16'-18'

COMMENTS:

LEGEND

- Bottom cap
- J- Plug
- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: NYSDEC	Location: 93 Main Street Binghamton, NY	Project No.: 0535598.02
URS Greiner, Inc.	MONITORING WELL CONSTRUCTION DETAILS	Well Number: MW-3

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02/02/9

DRILLING SUMMARY

Geologist:
Brian Demme

Drilling Company:

Buffalo Drilling Company, Inc.

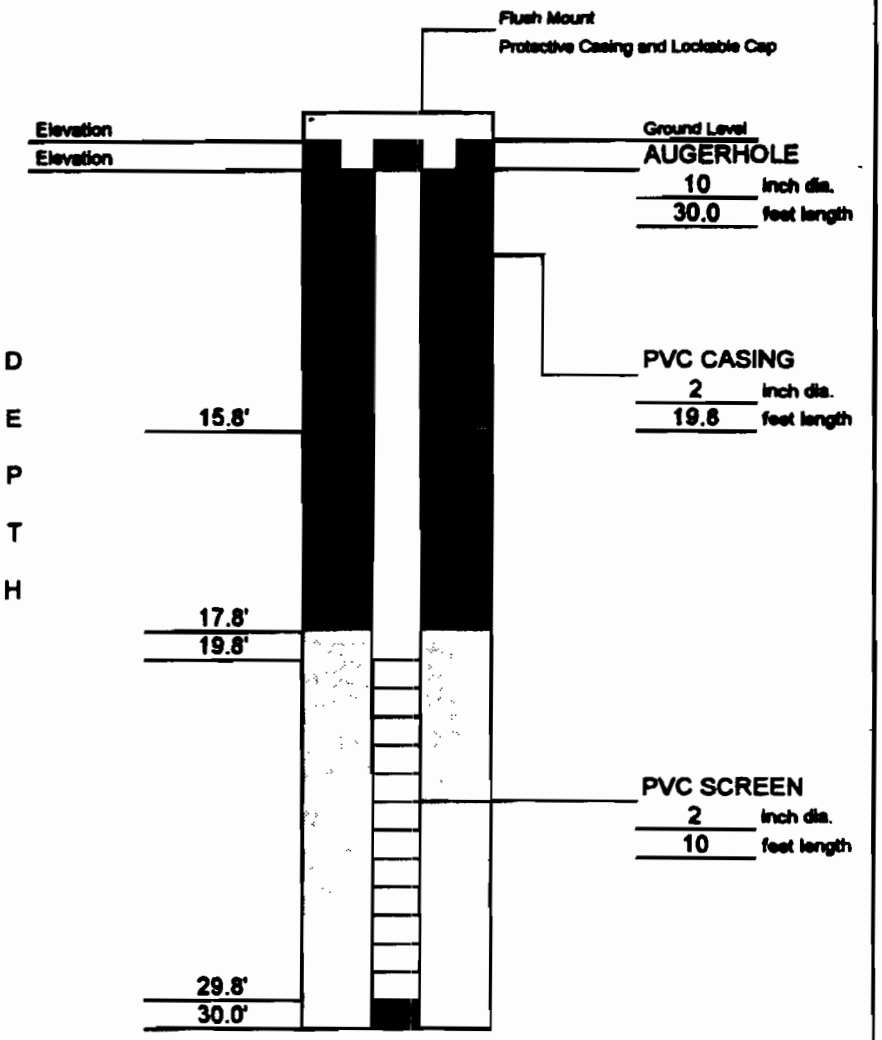
Driller:
Don Rimbeck

Rig Make/Model:
CME-55

Date:
November 20, 1998

GEOLOGIC LOG

Depth(ft.)	Description
0-0.1	Organics
0.1-10	Fill: c-f sand, and c-f gravel, cinders, silt, ash
10-14	Cobbles and Boulders
14-18	Silt (till) with some gravel, cobbles
18-27	Boulders
27-30	Silt (till) with some gravel, trace clay



WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface: Steel grade box	Type: 2" PVC	Type: #2 Sand Setting: 17.8'-30'
Monitor: 2" PVC	Slot Size: 0.02	SEAL MATERIAL: Type: Bentonite Setting: 15.8'-17.8'

COMMENTS:

LEGEND

- Bottom cap
- J- Plug
- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: NYSDEC	**Location: 93 Main Street Binghamton, NY**	**Project No.: 0535598.02**
URS Greiner, Inc.	**MONITORING WELL CONSTRUCTION DETAILS**	**Well Number: MW-4**

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02/02/

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Well Construction Log

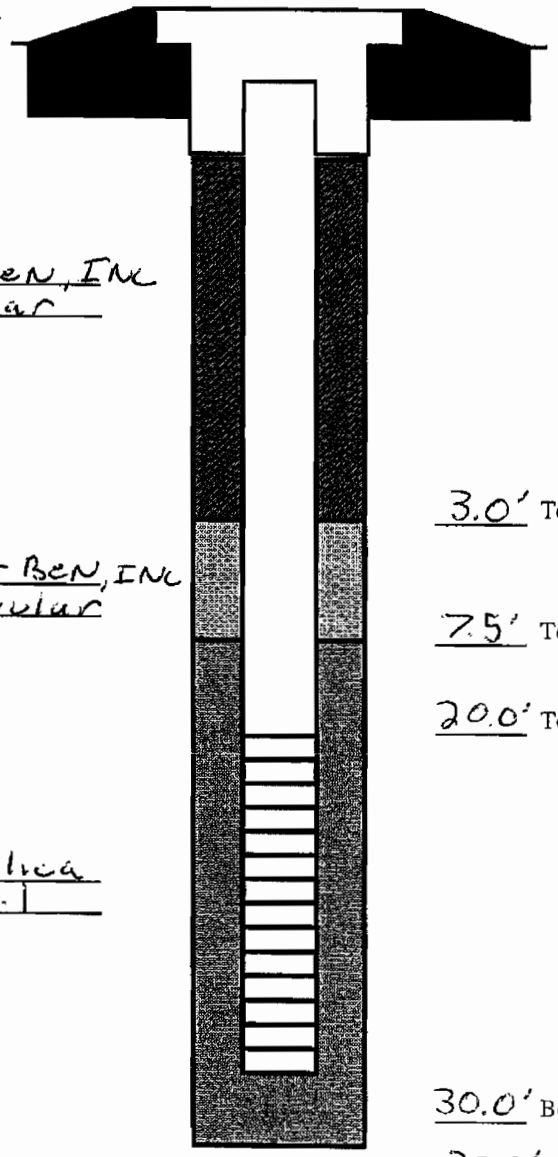
Site 93 Main Street Job No. 2217 Well No. MW-11

Total Depth 30.0' Surface Elevation 866.35 Top Riser Elevation 865.61

Water Levels (Depth, Date, Time) 12/10/04, 1418, 18.72' Date Installed 12/6/04 + 12/10/04

Riser Dia. 4" ID Material PVC Length 9.2'
Screen Dia. 4" ID Material PVC Length 20.0' Slot Size 20

SCHEMATIC



Surface Seal Type: Quick-Crete II Concrete

Ground Surface
865.61 Riser Elevation
3.0 Bottom Surface Seal

Grout Type: WYN-BEN, INC Granular

3.0' Top Seal

Seal Type: WYN-BEN, INC Granular

7.5' Top Sand Pack

20.0' Top Screen

Sand Pack Type: US Silica
Size: NO. 1

30.0' Bottom Screen

30.0' Total Depth of Boring

D&B_WCLF

Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Well Construction Log

Site 93 Main Street Job No. 2217 Well No. MW-12

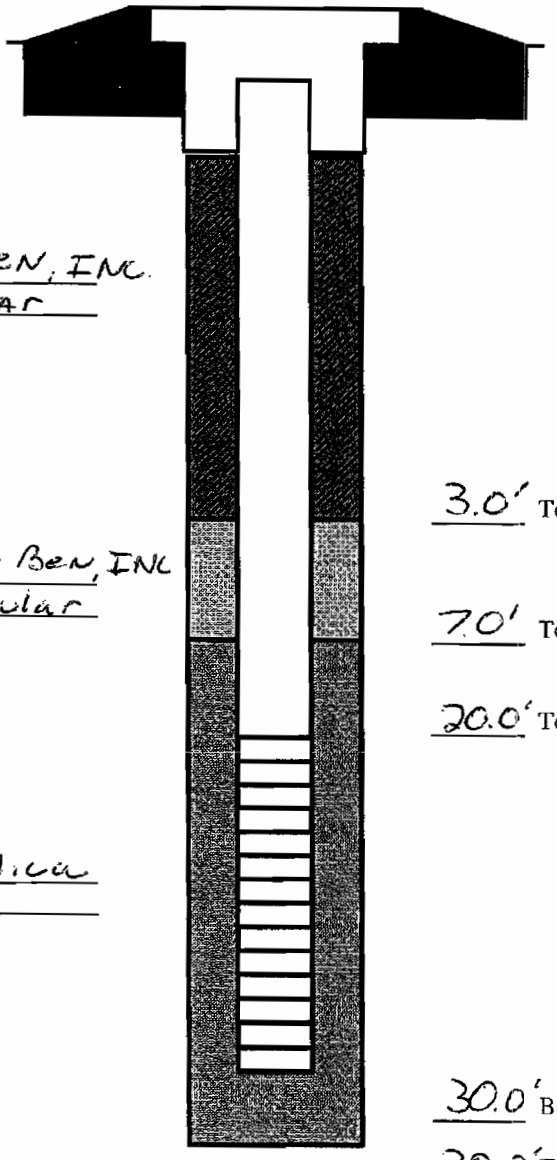
Total Depth 30.0' Surface Elevation 865.34 Top Riser Elevation 864.79

Water Levels (Depth, Date, Time) 19.5, 12/10/04, 1135 Date Installed 12/9/04 + 12/10/04

Riser Dia. 4" ID Material PVC Length 9.4'

Screen Dia. 4" ID Material PVC Length 20.0' Slot Size 20

SCHEMATIC



Surface Seal Type: Quick-Crete II Concrete

Ground Surface

Riser Elevation

3.0 Bottom Surface Seal

Grout Type: WYN-BEN, INC. Granular

Seal Type: WYN-BEN, INC Granular

3.0' Top Seal

7.0' Top Sand Pack

20.0' Top Screen

Sand Pack Type: US Silica

Size: NO 1

30.0' Bottom Screen

30.0' Total Depth of Boring

D&B_WCLF

Appendix D

Field Forms

EA Engineering PC and its Affliate,
EA Science and Technology

GROUNDWATER SAMPLING
PURGE FORM

Well I.D.:	**EA Personnel:**	**Client:** NYSDEC
Location:	**Well Condition:**	**Weather:**
Sounding Method:	**Gauge Date:**	**Measurement Ref:**
Stick Up/Down (ft):	**Gauge Time:**	**Well Diameter (in):**

Purge Date:	**Purge Time:**
Purge Method:	**Field Technician:**

Well Volume

A. Well Depth (ft):	**D. Well Volume (gal) per ft:** 0.16	**Depth/Height of Top of PVC:**
B. Depth to Water (ft):	**E. Well Volume (gal) (C*D):** 0	**Pump Type:**
C. Liquid Depth (ft) (A-B): 0	**F. Five Well Volumes (gal) (E3):** 0	**Pump Designation:**

Water Quality Parameters

Time (hrs)	pH (pH units)	Conductivity (S/m)	Turbidity (ntu)	DO (mg/L)	Temperature (oC)	ORP (mV)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)

Total Quantity of Water Removed (gal): _____ **Sampling Time:** _____

Samplers: _____ **Split Sample With:** _____

Sampling Date: _____ **Sample Type:** _____

COMMENTS AND OBSERVATIONS: _____

LANDFILL INSPECTION REPORT **Day:** _____ **Date:** _____

NYSDEC		Temperature: (F)		(am)		(pm)
		Wind Direction:		(am)		(pm)
93 Main Street Site		Weather:	(am)			
NYSDEC Site # 704027			(pm)			
Contract # D006987		Arrive at site		(am)		
Binghamton, New York		Leave site:		(pm)		

Site Security

Evidence of vandalism (wells, vents, protective cover damage):

Evidence of cover system intrusion (ruts, burrows, excavations):

Evidence of human encroachment (trash, fire pits, tire/footprints):

General site condition:

Additional Comments:

Groundwater Monitoring Points

Evidence of damage to wells or surrounding area (cracking, misalignment, missing pieces):

Evidence of cover system subsidence or upheaval near wells/vents:

Evidence of wildlife intrusion (nests, burrows, wasp nests):

Evidence of spilled liquids (well tampering/vent blowout):

Well covers in place and secure:

Additional Comments:

None

Site Drainage

Evidence of drainage issues (i.e., blockage due to sedimentation, ponding):

Inspection Photolog

Appendix E

Quality Assurance Project Plan

1. PURPOSE AND OBJECTIVES

1.1 PURPOSE

This Quality Assurance Project Plan (QAPP) is for the site management work done for the 93 Main Street site in the city of Binghamton, Broome County, New York (New York State Department of Environmental Conservation [NYSDEC] Site No. 704027). This QAPP contains site-specific procedures for the collection, analysis, and evaluation of data that will be legally and scientifically defensible.

1.2 QUALITY ASSURANCE PROJECT PLAN OBJECTIVES

This QAPP provides site-specific information and standard operating procedures applicable to all work performed at the site that. The information includes definitions and goals for data quality and required types and quantities of quality assurance (QA)/quality control (QC) samples. The procedures address sampling protocols; field documentation; sample handling, custody, and shipping; instrument calibration and maintenance; auditing; data reduction, validation, and reporting; corrective action requirements; and QA reporting. The Site Management Plan contains a site description and information on site field activities; such as, sample locations, sampling procedures, analytical methods, and reporting limits.

2. PROJECT ORGANIZATION AND RESPONSIBILITIES

While all personnel involved in an investigation and the generation of data are implicitly a part of the overall project management and QA/QC program, certain members of the Project Team have specifically designated responsibilities. Project responsibilities are summarized below.

2.1 CONSULTANT

The consultant responsible for site management will provide field support during groundwater sampling activities and evaluation of analytical data. The roles required in this project include:

- ***Project QA/QC Officer***—The QA/QC Officer provides guidance on technical matters and reviews technical documents relating to the project. They assess the effectiveness of the QA/QC program and recommend modifications when applicable. Additionally, the QA/QC Officer may delegate technical guidance to specially trained individuals under his direction.

- ***Project Manager***—The Project Manager provides overall coordination and preparation of the project activities. This includes coordination with NYSDEC, budget control, subcontractor performance, implementation of the QAPP, and allocation of resources and staffing to implement both the QA/QC program and the site Health and Safety Plan.

- ***Site Manager***—The Site Manager will serve as the on-site contact person for field activities and tests. They will be responsible for coordinating the field activities, including inspecting and replacing equipment, preparing daily and interim reports, scheduling sampling and inspections, and coordinating shipment and receipt of samples and containers.

2.2 LABORATORY

Laboratory analyses for this project will be performed by an Environmental Laboratory Analytical Program (ELAP) certified laboratory. The laboratory will have its own provisions for conducting an internal QA/QC review of the data before they are released. The laboratories' contract supervisors will contact the consultant's Project Manager with any sample discrepancies or data concerns.

Electronic data deliverable formatted QA/QC reports will be filed by the analytical laboratories when data are submitted to the consultant. Corrective actions will be reported to the consultant's Project Manager along with the QA/QC report (Section 9 of the Generic QAPP). The laboratories may be contacted directly by the consultant or NYSDEC personnel to discuss QA concerns. The consultant will act as laboratory coordinator on this project and all correspondence from the laboratories will be coordinated with the consultant's Project Manager.

3. SAMPLING **RATIONALE, DESIGNATION, AND CONTAINERS**

3.1 SAMPLING RATIONALE

The sampling rationale is presented for groundwater monitoring in the Site Management Plan. Laboratory quality control samples including field duplicates, matrix spike, and matrix spike duplicates are to be collected at a frequency of 1 per 20 samples. Field duplicates are two samples of the same matrix, which are collected, to the extent possible, from the same location at the same time using the same techniques. Field duplicates provide information on the precision of the sampling and analysis process. Matrix spike and matrix spike duplicates are two additional samples of the same matrix fortified with the analyte(s) of interest and analyzed to monitor measurement bias associated with the sample matrix.

The remedial investigation laboratory program includes the number of samples for each sample location, as well as QA/QC samples (Table 1).

3.2 SAMPLE DESIGNATION

Field samples collected from the site will be assigned a unique sample tracking number. Sample/designation will be an alpha-numeric code, which will identify each sample by the site identification, matrix sampled, location number, and date of collection.

The following terminology will be used for the sample identification:

- **Groundwater Samples**

  — NYSDEC SITE ID-MW-XX

3.3 SAMPLE CONTAINERS

Types of sample containers and preservatives required for sample collection will be determined by the analyzing laboratory. Sample containers will be properly washed, decontaminated, and the appropriate preservative will be added by the analytical laboratory. Containers with preservative will be labeled accordingly.

3.4 SAMPLE HOLDING TIMES

Sample holding times will be in accordance with the NYSDEC Analytical Services Protocol (ASP) requirements. All samples shall be transferred to the analytical laboratory with enough time for the lab to process the samples before the holding time is expired.

3.5 SAMPLE TRACKING AND CUSTODY

The laboratory must satisfy the sample chain-of-custody requirements by implementing the following Standard Operating Procedures for laboratory/sample security:

- Samples are stored in a secure area
- Access to the laboratory is through a monitored area
- Visitors sign a visitor's log and are escorted while in the laboratory
- Only the designated sample custodians have keys to sample storage area(s)
- Transfers of samples in and out of storage are documented.

4. ANALYTICAL LABORATORY

The data collected during this investigation will be used to determine the presence and concentration of pesticides and herbicides in groundwater.

Groundwater samples collected during execution of the QAPP will be submitted to the approved analytical laboratory. The laboratory must be a New York State Department of Health ELAP-certified laboratory, meeting specifications for documentation, data reduction, and reporting. Preliminary analytical results will be provide within 14 days of sample receipt and full NYSDEC Analytical Services Protocol Category B deliverables and associated electronic data deliverables (EDDs) in Equis format will be provided to the consultant within 30 days of sample receipt.

4.1 CALIBRATION PROCEDURES AND FREQUENCY

Instruments and equipment used in this investigation are controlled by a formal calibration program, which verifies that equipment is of the proper type, range, accuracy, and precision to provide data compatible with specified requirements. Instruments and equipment that measure a quantity, or whose performance is expected at a stated level, are subject to calibration. Calibration is performed using reference standards or externally by calibration agencies or equipment manufacturers.

4.1.1 Calibration System

The following sections contain a discussion of the elements comprising the calibration system.

4.1.1.1 Calibration Procedures

Written procedures are used for all instruments and equipment subject to calibration. Whenever possible, recognized procedures, such as those published by the American Society of Testing and Materials or United States Environmental Protection Agency (USEPA), or procedures provided by manufacturers, are adopted. If established procedures are not available, a procedure is developed considering the type of equipment, stability characteristics of the equipment, required accuracy, and the effect of operational error on the quantities measured.

4.1.1.2 Calibration Frequency

Calibration frequency is based on the type of equipment, inherent stability, manufacturer's recommendations, values provided in recognized standards, intended data use, specified analytical methods, effect of error upon the measurement process, and prior experience.

4.1.1.3 Calibration Reference Standards

Two types of reference standards will be used by the standby laboratories for calibration:

- ***Physical standards***, such as weights for calibrating balances and certified thermometers for calibrating working thermometers, refrigerators and ovens, are generally used for periodic calibration.

- ***Chemical standards***, such as Standard Reference Materials provided by the National Institute of Standards and Technology or USEPA. These may include vendor-certified materials traceable to National Institute of Standards and Technology or USEPA Standard Reference Materials. These are primarily used for operational calibration.

4.1.1.4 Calibration Failure

Equipment that cannot be calibrated or becomes inoperable is removed from service. Such equipment must be repaired and satisfactorily recalibrated before re-use. For laboratory equipment that fails calibration, analysis cannot proceed until appropriate corrective action is taken and the analyst achieves an acceptable calibration.

Laboratory managers are responsible for development and implementation of a contingency plan for major equipment failure. The plan includes guidelines on waiting for repairs, use of other instrumentation, subcontracting analyses, and evaluating scheduled priorities.

4.1.1.5 Calibration Records

Records are prepared and maintained for each piece of equipment subject to calibration. Records demonstrating accuracy of preparation, stability, and proof of continuity of reference standards are also maintained. Copies of the raw calibration data are kept with the analytical sample data.

4.1.2 Operational Calibration

Operational calibration is generally performed as part of the analytical procedure and refers to those operations in which instrument response (in its broadest interpretation) is related to analyte concentration. Included is the preparation of a standard response (calibration) curve and often the analysis of blanks.

4.1.2.1 Preparation of Calibration Curve

Preparation of a standard calibration curve is accomplished by the analysis of calibration standards, which are prepared by adding the analyte(s) of interest to the solvent that is introduced into the instrument. The concentrations of the calibration standards are chosen to cover the working range of the instrument or method. Sample measurements are made within this working range. The calibration curve is prepared by plotting or regressing the instrument responses versus the analyte concentrations. Concentrations of the analyzed samples are back-calculated from the calibration curve.

4.1.2.2 Blanks

Reagent and/or solvent blanks are analyzed to assess if the materials used to prepare the standards are free from interfering substances that could affect the analysis. A method blank is prepared whenever samples are processed through steps that are not applied to the calibration standards.

4.1.3 Periodic Calibration

Periodic calibrations are performed for equipment (e.g., balances, thermometers) that is required in the analytical method, but that is not routinely calibrated as part of the analytical procedure.

4.2 FIELD EQUIPMENT CALIBRATION

The procedures and frequencies for the calibration of field equipment are provided below in the table below.

FIELD INSTRUMENTATION CALIBRATION FREQUENCY		
Instrument	Frequency of Calibration Check	Calibration Standard
pH Meter	Prior to use – daily	Commercially prepared pH buffer solutions (4.01, 7.00, 10.00)
Conductivity Meter	Prior to use – daily	Commercially prepared saline solution (12.9 mS/cm)
Water Level Meter	Prior to initiating field work	100-ft engineer's tape
Dissolved Oxygen Meter	Per sampling event	Saturation
Photoionization Detector	Prior to use – daily	100 ppm isobutylene
Turbidity	Prior to use – daily	10 NTU, 200 NTU
NOTE: NTU = Nephelometric turbidity units.		

5. ANALYTICAL TEST PARAMETERS

This QAPP will require the analysis of aqueous samples using USEPA Method 8081A for pesticides, and USEPA Method 8151A for herbicides. Compound lists for each analytical method are included in Table 2.

6. ANALYTICAL DATA VALIDATION

The laboratory will review data prior to its release from the laboratory. Objectives for review are in accordance with the QA/QC objectives stated in the NYSDEC Division of Environmental Remediation-10. The laboratories are required to evaluate their ability to meet these objectives. Outlying data will be flagged in accordance with laboratory standard operating procedures and corrective action will be taken to rectify the problem.

In order to ensure the validity of analytical data generated by a project, it will be validated by an entity independent from the analysts and the project. The resumes of the personnel providing the data validation services shall be submitted for approval under a separate cover.

TABLE 1 SITE CHARACTERIZATION ANALYTICAL PROGRAM

	Sample Matrix	Pesticides (USEPA 8081A) and Herbicides (USEPA 8151A)
No. of Samples	Aqueous	9
Field Duplicate		1
MS/MSD		2
Total No. of Analyses		12

NOTE: USEPA = U.S. Environmental Protection Agency.
MS/MSD= Matrix spike/matrix spike duplicate.
Laboratory quality control samples will be collected at a rate of 1 per 20 samples, per matrix.

TABLE 2 ANALYTE LIST AND ANALYTICAL REPORTING LIMITS

USEPA METHOD 8081A (PESTICIDES)	
Analyte	Reporting Limit ppb
4,4'-DDD	0.10
4,4'-DDE	0.10
4,4'-DDT	0.10
Aldrin	0.050
alpha-BHC	0.050
alpha-Chlordane	0.050
beta-BHC	0.050
delta-BHC	0.050
Dieldrin	0.10
Endosulfan I	0.050
Endosulfan II	0.10
Endosulfan sulfate	0.10
Endrin	0.10
Endrin aldehyde	0.10
Endrin ketone	0.10
gamma-BHC	0.50
gamma-Chlordane	0.050
Heptachlor	0.050
Heptachlor epoxide	0.050
Methoxychlor	0.50
Toxaphene	5.0
USEPA METHOD 8151A (HERBICIDES)	
Analyte	Reporting Limit ppb
2,4,5-T	1.0
2,4,5-TP (Silvex)	1.0
2,4-D	1.0
Dinoseb	1.0